



Dynamic Exploits:

The Science of Worker Control
in the On-Demand Economy

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About the Report

On-demand service platforms (e.g., Uber, Lyft, Postmates and Caviar) recruit workers by promising on-the-job flexibility. Flexibility, however, is equally important to the firm: it justifies their classification of workers as independent contractors rather than employees. This designation has obvious financial benefits for companies, but it also introduces new challenges when workers' decisions run counter to the firm's needs. On-demand firms thus develop covert strategies to influence workers' decision-making such that their choices conform to company interests.

The most prominent of these control strategies involve dynamic pricing and dynamic wages. Understanding how such strategies work, however, is quite difficult; on-demand firms are notoriously opaque about their policies. To cut through this opacity, this report provides a critical review of an emergent literature in management science. This research constructs complex mathematical equations and computer simulations to model on-demand marketplaces; it then uses these simulations to evaluate various price and information manipulation strategies to maximize company revenue. The literature thus provides a unique window into companies' exploitative calculus that has been neglected from critical analyses of the on-demand economy. The report concludes with recommendations for on-demand workers seeking to organize and demand fairer working conditions.

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About MIC



The Media, Inequality & Change (MIC) Center is a collaboration between the University of Pennsylvania's Annenberg School and Rutgers University's School of Communication and Information. The Center explores the intersections between media, democracy, technology, policy, and social justice. MIC produces engaged research and analysis while collaborating with community leaders to help support activist initiatives and policy interventions. The Center's objective is to develop a local-to-national strategy that focuses on communication issues important to local communities and social movements in the region, while also addressing how these local issues intersect with national and international policy challenges.

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1. Introduction

The platform economy has been hailed as “the future of work”—a wholesale technological reconfiguration of labor and management. At present, however, it is unclear how this seemingly unstoppable transformation will affect the lives and livelihoods of the millions of Americans entering the platform workforce. Will the platform economy help workers by making work conditions more flexible and accommodating, or will its spoils go to the companies that manage the platforms?

This report focuses specifically on the “on-demand” economy—a large subset of the platform economy tailored to immediate mobile service provision. On-demand platforms generally operate within urban markets, and in service areas such as food and grocery delivery or taxi and ride-hailing services. This report asks, given that the on-demand economy promises workers greater freedom and flexibility, how do firms manage their workforces? What are the consequences and implications of these management strategies for workers?

The on-demand economy is shot through with contradictions. At its core, however, is one particularly striking inconsistency: while on-demand platforms’ business models are grounded in service provision, they nonetheless define themselves as technology companies, not service providers. Uber and Lyft provide transportation services, Postmates, InstaCart, and Caviar delivery services. Why, then, do these platforms’ terms of service state that the companies are technology producers, not service providers? Postmates, for example, insists that it is not a delivery company but the producer of “a mobile app and web-based technology platform that connects consumers, retail stores, and restaurants, with independent contractor couriers to facilitate on-demand delivery services.”¹

These claims are hardly accidental. Nor can they be chalked up as mere aspirations for companies like Uber to join the ranks of Silicon Valley’s booming digital economy. Rather, when on-demand firms claim to be technology producers, they’re engaging in a form of *legal subterfuge* that justifies their classification of workers as *independent contractors rather than employees*. As

the logic goes, if on-demand companies are platform operators and not service providers, then their role is that of a “middle-man”—facilitating a marketplace for a particular service by connecting supply (independent service providers) with demand (customers), and collecting a fee from each transaction.

This independent contractor classification is crucial. It allows on-demand companies to outsource costs and risks onto the workers rather than absorb those costs and risks as overhead, which is what traditional service-providing firms must do. With an on-demand workforce, firms save up to 30% on labor-related expenditures.² As researchers have argued, on-demand firms’ profitability and scalability hinges on the independent contractor classification.³

But managing a workforce of independent service providers—rather than employees—introduces challenges for on-demand companies that traditional employment models do not face. The independent contractor classification comes with guarantees for worker autonomy, meaning that firms are legally prohibited from exerting certain forms of control over their workers. For example, firms cannot force independent contractors to work at certain times or in specific geographical areas, nor can they require that workers accept specific job orders. These prohibitions result in major logistical hurdles because when workers have greater autonomy, their choices can run counter to firms’ needs. For example, poor weather can lead to rapid spikes in demand for ride-hailing services. If too few workers choose to log on, then customers can face long wait times and will likely seek other transportation options. In response to these and other challenges, on-demand firms use strategies to influence and sway workers’ job-related decisions to align more closely with the company’s interests.

The most powerful and commonly used strategy is dynamic pricing. Dynamic pricing describes the practice of modulating the commercial value of a product or service based on perceived market conditions. On-demand firms use dynamic price and wage modulations to manipulate workers’ decisions about where and when to work, for how long, and which orders to accept or reject. Dynamic pricing is thus a key mechanism of

1 Postmates. “Terms of Service,” 2017. <https://about.postmates.com/legal/terms>.

2 Nick Srnicek. *Platform Capitalism*. Malden, MA: Polity, 2016, 76.

3 Srnicek, *Platform Capitalism*.

control for on-demand firms: it allows them to effectively manage entire fleets of independent contractors without flagrantly violating their legal protections.

With access to companies' control strategies—with a better sense of how techniques like dynamic pricing and dynamic wages are used toward exploitation—on-demand workers could use those insights in efforts to organize against inequitable and exploitative working conditions. Accessing these strategies, however, can be extremely difficult. On-demand companies are notoriously opaque about their policies.⁴

To circumvent this opacity, this report examines an emergent stream of research in the field of management science. This literature uses complex mathematical equations and computer simulations to model on-demand marketplaces, with the goal of evaluating different strategies of information and price manipulation to maximize company revenue. In other words, the management science literature offers a unique window into companies' efforts to control and exploit on-demand workers.

The remainder of the report is organized as follows. The next section (2) discusses the costs and benefits of flexible employment for on-demand firms. The following section (3) introduces dynamic pricing (also called "surge," "demand," or "time-based pricing") and discusses the challenges that it presents for managing flexible labor. The subsequent section (4) presents a critical review of the management science literature. The final section (5) concludes the report by considering what workers can learn from company strategies and how this might inform worker organizing and demands in future struggles for more equitable labor conditions.

4 Ben Schiller. "You Are Being Exploited by The Opaque, Algorithm-Driven Economy." *Fast Company*, 2017. <https://www.fastcompany.com/40447841/you-are-being-exploited-by-the-opaque-algorithm-driven-economy>.

Le Chen, Alan Mislove, and Christo Wilson. "Peeking Beneath the Hood of Uber." Paper presented at 'IMC conference. Tokyo, Japan, 2015. <https://doi.org/10.1145/2815675.2815681>.

John Naughton. "With this 'Mirage of a Marketplace,' Uber is Taking its Customers for a Ride." *The Guardian*, January 10, 2016, sec. Opinion. <https://www.theguardian.com/commentisfree/2016/jan/10/algorithms-uber-marketplace-mirage>.

2. Flexible Employment in the On-Demand Economy

The platform economy is often discussed as "the future of work."⁵ What this entails in practice, however, can be extremely fuzzy. Often, observers point to algorithms as the key defining feature of platform management.⁶ And although algorithms are indeed central to on-demand workers' experiences, an overlooked but extremely salient feature is that on-demand firms classify their workers as *independent contractors* rather than full- or even part-time employees.

The independent contractor classification entails restrictions that traditional service models easily avoid. In the United States, the independent contractor classification is deemed appropriate "if the payer [or employer] has the right to control or direct *only the result of the work* and *not what will be done and how it will be done*."⁷ The Internal Revenue Service (IRS) defines control as both behavioral ("if the business controls what work is accomplished and directs how it is done") and financial ("if the business directs or controls financial and certain relevant aspects of a worker's job").⁸

5 Vikrum Aiyer. "How the On-Demand Economy Will Impact the Future of Work." Wharton Public Policy Initiative, November 22, 2017. <https://publicpolicy.wharton.upenn.edu/live/news/2219-how-the-on-demand-economy-will-impact-the-future>; James Manyika. "Technology, Jobs, and the Future of Work." *McKinsey*, May 1, 2017. <https://www.mckinsey.com/featured-insights/employment-and-growth/technology-jobs-and-the-future-of-work>;

Washington Post Live. "The Future of Work." *Washington Post*, December 18, 2018. <http://www.washingtonpost.com/post-live-december-2018-future-of-work/>.

6 E.g., Alex J. Wood, Mark Graham, and Vili Lehdonvirta. "Good Gig, Bad Gig: Autonomy and Algorithmic Control in the Global Gig Economy." *Work, Employment and Society* 33, no. 1 (2009): 56–75.

7 Internal Revenue Service (IRS). "Independent Contractor Defined," April 24, 2018. <https://www.irs.gov/businesses/small-businesses-self-employed/independent-contractor-defined> (emphasis added).

8 Internal Revenue Service (IRS). "Employee or Independent Contractor? Know the Rules," May 1, 2017. <https://www.irs.gov/newsroom/employee-or-independent-contractor-know-the-rules>.

In other words, employers engaging independent contractors must yield significant control over the workflow in ways that are not necessary for traditional employment. Consequently, firms that hire independent contractors are prohibited from forcing their workers to do certain things; legally, they can only judge the quality of the final product or service, not how the work is done. In the on-demand context, this means that firms are prohibited from directing when or where workers are active, or which work-orders they must accept.

By yielding this control, companies are exempted from a variety of expensive worker obligations. In the United States, the independent contractor classification frees firms from having to pay for a number of costly worker protections—minimum wage, overtime, contributions to Social Security, Medicare, workers' compensation, unemployment, and health insurance. It also exempts companies from having to invest in equipment.⁹ In fact, an equally defining feature of the on-demand economy is that independent contract-workers use and pay for their own tools.¹⁰ For drivers on Uber and Lyft, for example, that would mean the cars and related costs, such as maintenance and fuel, but it also means that workers are responsible for the physical and financial risk of driving for a living, including auto and health insurance coverage.¹¹ For couriers working for delivery platforms Caviar and Postmates, that might involve bicycle maintenance and the related physical risk of riding a bike through busy city streets.¹² In both cases, the firms outsource the costs and risks directly to the workers themselves.

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- 9 The IRS prohibits payers from control of directing "The extent of the worker's investment in the facilities or tools used in performing services." See IRS "Employee or Independent Contractor?"
- 10 Srnicek refers to on-demand platforms as "lean" to reflect this outsourcing. See Srnicek, *Platform Capitalism*.
- 11 There are notable exceptions to this, as Uber and other companies have rolled out predatory, sub-prime auto-financing programs to recruit new drivers, e.g., Wolf Richter. "Uber's Subprime Auto Loans Are Causing a Lot of Problems." *Business Insider*, August 9, 2017. <https://www.businessinsider.com/uber-subprime-auto-loans-running-it-off-the-road-2017-8>
- 12 In May, 2018, Pablo Avendano, a courier for Caviar, was killed by a motorist on the job, raising concerns about on-demand workers' rights. See Juliana Feliciano Reyes. "After Caviar Courier's Death, What about Gig Workers' Rights?" *Philly.com*, May 14, 2018. <http://www.philly.com/philly/news/caviar-bike-death-philly-gig-economy-20180514.html>.

In a vast public relations campaign, proponents of the platform economy have flipped the narrative on independent contractor work. Rather than firms outsourcing costs and risk onto workers, proponents celebrate the freedom and flexibility of the independent contractor designation, denouncing traditional employment as overly rigid due to strict scheduling requirements and other forms of employer control.¹³ Companies, too, are quick to use the narrative of flexibility to recruit workers, even going so far as to equate independent contractor work with being a small business owner. As Lyft puts it on its worker-recruitment webpage, "Whether you're trying to offset costs of your car, cover this month's bills, or fund your dreams, Lyft will get you there. So, go ahead. Be your own boss."¹⁴

The success of the flexibility narrative likely owes to the increasing precariousness of labor. Since the 2008 global economic crisis, real wages have remained stagnant and income inequality has soared.¹⁵ On-demand firms recruit from the ranks of workers who were traditionally excluded from formal employment and who have long been forced to "hustle" with precarious gigs.¹⁶ However, they also actively seek workers with other full- or part-time employment relationships and benefits but who nonetheless struggle to make ends meet. In this sense, the promise of flexibility may be particularly attractive to the members of a shrinking middle class: along with

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- 13 Robert Graboyes. "Gigs, Jobs, and Smart Machines." Mercatus Center, George Mason University, 2016. http://mercatus.org/expert_commentary/gigs-jobs-and-smart-machines; Rachel Greszler. "The Value of Flexible Work Is Higher Than You May Think." The Heritage Foundation, September 15, 2017. <https://www.heritage.org/jobs-and-labor/report/the-value-flexible-work-higher-you-may-think>
- 14 Lyft. "Drive with Lyft." <https://www.lyft.com/drive-with-lyft> (page recorded 1/8/2019)
- 15 Stanford Center on Poverty & Inequality. "20 Facts About U.S. Inequality That Everyone Should Know," 2011. <https://inequality.stanford.edu/publications/20-facts-about-us-inequality-everyone-should-know>.
- 16 Ursula Huws. "Logged Labour: A New Paradigm of Work Organisation?" *Work Organisation, Labour & Globalisation* 10, no. 1 (2016): 7–26. Julia Ticona and Alexandra Mateescu. "Trusted Strangers: Carework Platforms' Cultural Entrepreneurship in the on-Demand Economy." *New Media & Society*, 2018. <https://doi.org/10.1177/1461444818773727>. Niels van Doorn. "Platform Labor: On the Gendered and Racialized Exploitation of Low-Income Service Work in the 'On-Demand' Economy." *Information, Communication & Society* 20, no. 6 (2017): 898–914.

college and graduate students taking classes, employees with strict schedules are told that they can earn extra money when it works for them: no need to adhere to companies' schedules; just sign on and make money when it works for you. Indeed, a 2015 survey of Uber drivers conducted by the Head of Policy Research at Uber and prominent Princeton economist Alan Kreuger found that about 31% of drivers have full-time jobs while another 30% had part-time employment.¹⁷

However, as companies purport to cede control over their workforces and tout the flexibility of independent contracting, they also face logistical challenges that traditional employment models easily avoid. For example, on-demand platforms have to ensure that the appropriate number of workers are available to work at any given point in time. Scheduling flexibility makes this particularly difficult. On the one hand, companies want to ensure that enough workers are "logged on" during periods of high demand (e.g., poor weather for ride-hailing or a football game for food delivery) to satisfy customer requests for service. On the other hand, companies want to avoid having too many workers logged on during periods of low demand. When it's slow, workers receive few job orders and thus make little in wages; this can result in high rates of dissatisfaction and potentially an exodus of workers from the platform. Striking the right balance worker supply is a challenge for firms, especially as periods of high demand can correlate with unattractive working conditions (e.g., delivering food or driving during poor weather is both unpleasant and risky), which dissuade workers from logging on.

In response to these challenges, companies use techniques to manipulate workers' job-related decision-making.¹⁸ These manipulations make it possible to exert control over on-demand workforces as indirectly as possible, thereby avoiding flagrant violations of the independent contractor classification. However, companies are notoriously opaque about these techniques—especially the algorithms used to allocate job-orders to workers—often citing intellectual property

concerns to justify their secrecy and shielding themselves from academic or journalistic scrutiny.¹⁹

One approach to studying company strategies has focused on worker experiences. Over time, workers become intimately acquainted with firms' strategies to influence their decision-making; experienced workers intuit how and why on-demand platforms manipulate pay rates and information (e.g., the location of a customer requesting a ride, a delivery pick-up and drop-off, etc.).²⁰ Workers thus provide valuable insights into company strategies. But these insights are also limited by the fact that on-demand work platforms are designed intentionally *to restrict workers' access to market information*: workers cannot know how many other workers are logged on or how many customers are requesting orders at a given point in time. Concealing this information is key to how companies manage their workforces.

This report takes an alternative approach, with the goal of cutting through some of the companies' opacity. Rather than learning from workers' experiences, it focuses on a stream of research in the field of management science that models and simulates on-demand marketplaces. Management researchers at elite business and management schools (e.g., the Kellogg School of Management at Northwestern University, the Wharton School of Business at the University of Pennsylvania, the Haas School of Business at the University of California, Berkeley, the Columbia Business School, and the University of Chicago Booth School of Business) publish research articles in peer-reviewed journals and online paper exchanges that develop complex mathematical equations and computer simulations to model on-demand marketplaces. They then use those models to analyze information and payment manipulation techniques—the goal, always, to maximize company revenue.

17 Jonathan V. Hall and Alan B. Krueger. "An Analysis of the Labor Market for Uber's Driver-Partners in the United States." *ILR Review* 71, no. 3 (2018): 705–32.

18 Noam Scheiber. "How Uber Uses Psychological Tricks to Push Its Drivers' Buttons." *The New York Times*, 2017. <https://www.nytimes.com/interactive/2017/04/02/technology/uber-drivers-psychological-tricks.html>.

19 Schiller, "You Are Being Exploited By The Opaque, Algorithm-Driven Economy."

20 Marco Briziarelli. "Spatial Politics in the Digital Realm: The Logistics/Precarity Dialectics and Deliveroo's Tertiary Space Struggles." *Cultural Studies*, forthcoming. <https://doi.org/10.1080/09502386.2018.1519583>. Alex Rosenblat and Luke Stark. "Algorithmic Labor and Information Asymmetries: A Case Study of Uber's Drivers." *International Journal of Communication* 10 (2016): 3758–3784. Aaron Shapiro. "Between Autonomy and Control: Strategies of Arbitrage in the 'on-Demand' Economy." *New Media & Society*, 2017. <https://doi.org/10.1177/1461444817738236>.

Much of this modeling and simulation is attuned to the hidden logistical costs that flexible employment incurs for the on-demand firm. System inputs translate as “control levers” that companies can pull to mitigate those hidden costs.²¹ Rarely do the analyses consider how workers themselves might maximize their benefit: optimization is defined either from the perspective of the firm or of the customer. This literature, then, is likely targeted specifically to on-demand platform managers—to inform and optimize management strategies. At the very least, it can provide insights into how companies manage their workforces and information to which most workers would otherwise not have access.

Before detailing the types of worker-control strategies that this literature promotes, it will first be necessary to review some basic tenets of dynamic pricing—the most important control technique available to firms—and consider how dynamic pricing is currently used in the on-demand economy.

3. Dynamic pricing

Dynamic pricing (also called “surge,” “demand,” or “time-based pricing”) is the most commonly used technique to influence worker decision-making. Dynamic pricing involves the manipulation of a product or service’s commercial value based on perceived changes in market conditions.²² In general, the idea is to charge more when or where demand is high (peak business hours, central business districts, holiday weekends, etc.), and to charge less when or where demand is low—although there are notable exceptions to this approximation. The practice has a relatively long history in certain industries, most notably hospitality²³ and air travel.²⁴

Although dynamic pricing predates computing, automation and data generation make dynamic pricing more powerful. Digitized environments provide key data for modeling and predicting consumers’ preferences, including their willingness to pay at different price thresholds. This information can then be used to modulate prices according to statistical forecasts of supply and demand and to maximize profit. As such, in the years since the internet has been commercialized, dynamic pricing has proliferated, especially in online marketplaces including the on-demand economy.

21 Itai Gurvich, Martin Lariviere, and Antonio Moreno. “Operations in the On-Demand Economy: Staffing Services with Self-Scheduling Capacity.” *Social Science Research Network*, 2016. <https://papers.ssrn.com/abstract=2336514>.

22 Wedad Elmaghraby and Pinar Keskinocak. “Dynamic Pricing in the Presence of Inventory Considerations: Research Overview, Current Practices, and Future Directions.” *Management Science*. 49, no. 10 (October 2003): 1287–1309.

Arnoud Van den Boer. “Dynamic Pricing and Learning: Historical Origins, Current Research, and New Directions.” *Surveys in Operations Research and Management Science* 20, no. 1 (2015): 1–18.

23 Graziano Abrate, Giovanni Fraquelli, and Giampaolo Viglia. “Dynamic Pricing Strategies: Evidence from European Hotels.” *International Journal of Hospitality Management* 31, no. 1 (2012): 160–68.

24 R. Preston McAfee and Vera te Velde. “Dynamic Pricing in the Airline Industry.” Working paper, California Institute of Technology, Pasadena, CA, 2005. <http://www.academia.edu/download/40283826/DynamicPriceDiscrimination.pdf>

3.1 Dynamic pricing in the on-demand economy

In the on-demand economy, commerce takes place on platforms.²⁵ Platforms are digitized environments—automated and data-rich. Platforms reflexively produce and record information about the transactions that they facilitate, a capacity that organizational sociologist Shoshana Zuboff described in the 1980s as *informating*. Zuboff observed that as computers and information technologies were integrated to automate workflow processes in manufacturing and other sectors, managers learned how to capitalize on the data and information that computers generated about those processes.²⁶ “The devices that automate by translating information into action also register data about those automated activities, thus generating new streams of information”²⁷ that managers could use to streamline and optimize production. On-demand service platforms likewise generate streams of valuable data and information, which platform managers use to facilitate dynamic pricing.

For example, when future demand levels are uncertain, on-demand companies can mine the data and use statistical models to make predictions. These might be based on any number of factors that the firm identifies to be useful as a predictor of demand shifts, such as weather patterns, seasonal changes, or geographical differences. If a firm can anticipate and prepare for future demand shifts, then they can gain a significant competitive advantage over their rivals. Crucially, firms have exclusive access to this data and information; workers never see it.

Despite the advantages of on-demand platforms as digitized environments, they also differ from traditional commerce settings in important ways, and these differences have implications for dynamic pricing. Unlike traditional applications of dynamic pricing, in which *sellers* adjust prices in response to changing market conditions, on-demand firms do not operate as *sellers per se*. Rather, they position themselves as facilitators

of transactions between service providers (independent contractor-workers) and customers.²⁸ On-demand firms, in other words, operate “two-sided markets.” Consequently, if prices are adjusted for customers, then workers’ pay rates will also be affected.

On-demand firms thus exploit dynamic pricing not only to capitalize on demand shifts and capture a greater share of consumer surplus. *They also use dynamic pricing to manage worker supply*—and they do so by translating the logic of dynamic pricing to wage manipulations.

The basis for this managerial application of dynamic pricing hinges on a translation. On-demand firms do not conceive of their workers as sellers, but rather a peculiar type of *buyer*—one that trades his or her time, labor, and equipment for the privilege of access to platform-based transactions and income. In other words, to the firm, on-demand workers are not selling their labor, as classic Marxist political economists would have it. Instead, they too are consuming the platform: workers have a demand for work on the platform, just as customers have a need for the services those workers provide. And it is this dual demand that companies exploit with dynamically priced wages.²⁹

This reframing of workers as consumers is central to on-demand firms’ control. It operationalizes what the historian and philosopher Michel Foucault identified as a key tenet of neoliberal economic thought, wherein work is re-conceptualized as “an economic conduct practiced, implemented, rationalized, and calculated by the person who works.” Neoliberal economists consider “how the

25 On-demand platforms typically take the form of location-based smartphone apps, but some also operate as websites (for example, food delivery companies often offer website interfaces in addition to apps).

26 Shoshana Zuboff. “Automate/Informate: The Two Faces of Intelligent Technology.” *Organizational Dynamics*, Vol. 14, no. 2 (1985), 5-18.

27 Shoshana Zuboff. *In the Age of the Smart Machine: The Future of Work And Power*. New York, NY: Basic Books, 1988.

28 Recent work has also made the case that platforms function as monopsonistic buyers; see Arindrajit Dube, Jeff Jacobs, Suresh Naidu, and Siddharth Suri. “Monopsony in Online Labor Markets.” Working Paper. National Bureau of Economic Research, March 2018, available at <https://www.nber.org/papers/w24416>.

29 See Alex Rosenblat. *Uberland: How Algorithms Are Rewriting the Rules of Work*. First edition. Oakland, California: University of California Press, 2018. Rosenblat shows that Uber and other on-demand companies not only re-conceptualize workers as platform consumers; they have also developed a massive and dysfunctional management regime in which worker communication with platform managers mimics “customer service.”

person who works uses the means available to him.”³⁰ From this perspective, workers’ demand for access to work is analogous to consumers’ demand for market goods.³¹ Accordingly, “[f]rom the point of view of the worker, the wage is an income, not the price at which he sells his labor power... [but] quite simply the product or return on capital.”³² In the context of the on-demand economy, this means that platform managers seek to account for the costs (or capital) that workers face when they work: the value of their time, the value of the energy consumed or expended, etc., in exchange for which they receive payments—the income. Platform managers attempt to account for workers’ rationales to better predict the factors that prevent or encourage workers to “log on.” In other words, although workers may continue to see themselves as selling their labor in exchange for wages, to the firms and platform managers, this is almost irrelevant: what matters is how and why workers choose to work, when, and for how long.

In this inverted consumer market, dynamic pricing enables on-demand firms to tweak and manipulate worker incentives with the goal of influencing workers’ decision-making. Dynamically raising wages during periods of high demand is used to incentivize workers to log on, just as lowering prices during periods of low demand incentivizes customers to buy. And by observing how workers respond to these tweaks and manipulations through the “informed” data collected from the platform, companies can then identify the specific wage hikes that best incentivize workers to log on during periods of high demand—and, conversely, exactly how low they can set wages during periods of low demand.

3.2 On-demand labor elasticity

On-demand firms strive for a balance with dynamically priced wages. As business and operations and management science scholars Gérard Cachon, Kaitlin Daniels, and Ruben Lobel put it:

the platform’s primary goal with the design of its [payment] contract [with independent contractors] is to maximize its profit. Doing so requires a contract that assures providers [receive] sufficient expected profit. However, the contract must not give providers too much of an incentive to participate, which could lead to an excess of providers, nor too little incentive, which could entice too little participation from providers to satisfy demand.³³

This balance is difficult to strike. According to Cachon et al., firms must determine the exact rates at which service providers can be assured to receive “sufficient expected profit” while avoiding “an excess of providers” or “too little incentive.”

Whatever those exact rates may be, they are viewed as successful only if they can elicit what in economics is called “labor supply elasticity.” Labor supply elasticity describes the extent to which changes to wage rates affect labor supply. When elasticity is *positive*, the direction of changes to wages is the same as the changes to the labor supply. In other words, if wages go up and more workers become available, or if wages go down and fewer workers log on, then the elasticity is positive. Elasticity is *negative* when the effect is in the opposite direction: if wages go up but fewer workers become available, or if wages go down and the labor supply increases, then the elasticity is negative. The relationship is *inelastic* when worker supply is unaffected by wage manipulations (see Table 1).

30 Michel Foucault, *The Birth of Biopolitics: Lectures at the Collège de France, 1978-1979*. Edited by Michel Senellart. Translated by Graham Burchell. New York, NY: Palgrave Macmillan, 2008: 223.

31 Michael, Robert T., and Gary S. Becker. “On the New Theory of Consumer Behavior.” *The Swedish Journal of Economics* 75, no. 4 (1973): 378–96.

32 Foucault, *Birth of Biopolitics*: 223–4.

33 Gérard P. Cachon, Kaitlin M. Daniels, and Ruben Lobel. “The Role of Surge Pricing on a Service Platform with Self-Scheduling Capacity.” *Manufacturing & Service Operations Management* 19, no. 3 (2017): 369

Table 1: Labor supply elasticity

	Wage increase	Wage decrease
Worker-supply increase	Positive elasticity	Negative elasticity
Worker-supply decrease	Negative elasticity	Positive elasticity
No change	Inelasticity	Inelasticity

It is in on-demand companies' interest for workers to exhibit positive elasticities. *When workers are positively elastic, it means that they respond in predictable and desirable ways to payment manipulations.* Workers that exhibit inelastic behavior or negative elasticities are deemed "irrational,"³⁴ and "irrational" workers do not make very much money. For example, workers report that logging on when "surge pricing" is not active (i.e., without wage-hikes for high demand) leads to significantly lower earnings.³⁵ Many workers therefore find working outside of predictably busy periods (such as the end of the workday or after the bars let out for ride-hailing workers, or at dinner time for food delivery workers) to be simply "not worth it."³⁶

If it is only profitable for workers to log on during the busiest periods, then it is also the case that baseline (or non-surge) wages are functioning well as a *disincentive*.

34 M. Keith Chen and Michael Sheldon. "Dynamic Pricing in a Labor Market: Surge Pricing and Flexible Work on the Uber Platform." Los Angeles, CA: Uber/UCLA, December 11, 2015. https://www.anderson.ucla.edu/faculty_pages/keith.chen/papers/SurgeAndFlexibleWork_WorkingPaper.pdf; Michael Sheldon. "Income Targeting and the Ride-sharing Market," 2016. <https://static1.squarespace.com/static/56500157e4b0cb706005352d/t/56da114e707ebbe8e963ffc/1457131797556/IncomeTargetingFeb16.pdf>.

35 Ridesharing Forum. "How To Increase Your Earnings In Slow Periods Driving For Uber And Lyft." *Uber Drivers Forum For Customer Service, Tips, Experience*, October 15, 2017. <https://www.ridesharingforum.com/t/how-to-increase-your-earnings-in-slow-periods-driving-for-uber-and-lyft/60>; Ridester. "The Best Time to Drive for Uber & Lyft: Monday & Friday Mornings." Ridester Training, n.d. <https://www.ridester.com/training/lessons/monday-friday-mornings/>.

36 Rosenblat and Stark, "Algorithmic Labor and Information Asymmetries"; Shapiro, "Between Autonomy and Control."

As Juan Castillo, Dan Knoepfle, and Glen Weyl put it, "despite the framing as 'surge prices' to make the platform attractive to drivers, in fact dynamic pricing is more similar to a discount" that firms offer to customers when demand is low—and that discount comes out of workers' wages. From this point of view, in a double-sided marketplace of worker-consumers and customer-consumers, workers' wage rates decrease to incentivize customers. In Cachon et al.'s terms, we would say that the contract is doing a good job of "not giv[ing] providers too much of an incentive to participate, which could lead to an excess of providers." An article for *Forbes* described this tendency for Uber drivers:

for those working just a few hours here and there, earnings are wildly varied. Some drivers took home an impressive \$60 an hour. Others earned less than \$10 an hour... Drivers are starting to figure this out. Expect to see more drivers working part-time on Uber, dropping in to work the highest-grossing hours but not wasting time on slow periods.³⁷

Such observations suggest that dynamic pricing is indeed used to ensure positive labor supply elasticity—wherein wages are sufficiently high during periods of high demand, and sufficiently low wages during slower periods.

Firms need this positive elasticity for dynamic pricing to be effective. For example, on-demand companies actively seek to mitigate a practice known as "income-targeting." Income targeting describes workers who choose to work only until they have earned a predetermined minimum, after which they log off, regardless of the possibility for higher wages in the near-term future.³⁸ Income targeting is negatively elastic (i.e., when payments go up, workers log off sooner because they hit their targets faster) and as such, it poses a challenge to on-demand companies' core assumptions about worker responses

37 Ellen Huet. "Uber Data Show How Wildly Driver Pay Can Vary." *Forbes*, December 1, 2014. <https://www.forbes.com/sites/ellenhuet/2014/12/01/uber-data-show-how-wildly-driver-pay-can-vary/>.

38 Colin Camerer, Linda Babcock, George Loewenstein, and Richard Thaler. "Labor Supply of New York City Cabdrivers: One Day at a Time." *The Quarterly Journal of Economics* 112, no. 2 (1997): 407–41.

to wage manipulations. Such negative elasticities can even affect company profits. As researchers at Uber wrote in an analysis of driver behaviors, if drivers were found to engage in income targeting, then they would be “undermin[ing] the benefits of emerging ‘sharing economy’ markets where tasks are dynamically priced,”³⁹ “significantly reduc[ing] [companies’] economic gains from dynamic pricing.”⁴⁰

It is thus in firms’ economic interest to promote positive labor supply elasticities while preventing income targeting and other “irrational,” negatively elastic or inelastic behaviors. The following section presents a critical review of the management science literature to better understand the strategies by which companies attempt to facilitate these elasticities. It provides (indirect) evidence of the information and payment manipulation techniques that companies use to align workers’ decisions with their own interests.

4. The Science of Control

Management science draws on the fields of economics, engineering, computer science, and business to develop a “scientific approach to solving management problems in order to help managers make better decisions.”⁴¹ This scientific approach involves several mediations. Problems are formalized as mathematical relationships between variables within a model. Models provide “abstract representations” of a problem and can be resolved by identifying “optimal solutions.” Optimal solutions determine the values necessary to maximize a key variable or set of variables that are determined to be the root of the formalized problem—typically, how to increase profit or revenue.⁴² When applied to the platform or on-demand economy, then, management science formalizes problems based on the types of logistical challenges identified above—namely, how to strike a balance between labor supply and customer demand given the constraints of worker flexibility.

4.1 Taking on-demand firms’ claims at face value

The most salient and immediate rhetorical feature of the management science literature is that it takes on-demand firms’ claims at face value. Researchers generally agree, either implicitly or explicitly, with companies’ claims to be platform managers facilitating a two-sided market of customers and independent service providers.⁴³ The firm’s perspective thus becomes naturalized as a set of model parameters and constraints. For example, in their article “Spatial Pricing in Ride-Sharing Networks,” management

41 Bernard W. Taylor III. *Introduction to Management Science*. 11th Edition. Boston: Pearson, 2012, 2.

42 I found one notable exception, which is a study focusing on how on-demand drivers can maximize their earnings. See Harshal A. Chaudhari, John W. Byers, and Evimaria Terzi. “Putting Data in the Driver’s Seat: Optimizing Earnings for On-Demand Ride-Hailing.” *Proceedings of the Eleventh ACM International Conference on Web Search and Data Mining*, 90–98. WSDM ’18. New York, NY, USA: ACM, 2018. <https://doi.org/10.1145/3159652.3159721>.

43 Even Chaudhari et al.’s study on earning maximization affirms company claims that workers are independent contractors: the very premise of the article is that workers make strategic decisions, which would not be possible if they were employees under firms’ direct control.

39 Chen and Sheldon, “Dynamic Pricing in a Labor Market,” 1.

40 Chen and Sheldon, “Dynamic Pricing in a Labor Market,” 13.

science researchers Kostas Bimpikis, Ozan Candogan, and Daniela Saban explain that on-demand ridesharing platforms “do not employ any drivers but rather operate as two-sided markets that aim to improve the matching between riders and drivers.”⁴⁴ This foundational premise is rarely, if ever, questioned, despite a growing number of lawsuits challenging the legitimacy of the independent contractor classification.⁴⁵

Affirming on-demand firms’ claims in a research context reifies the flexibility narrative that on-demand companies promote—as though the on-demand business model were the natural outcome of an evolution from traditional employment models to independent contractor work. Little, if any, of the management science literature addresses firms’ decisions to hire independent contractors.⁴⁶ Instead, the language gives a sense that both workers and firms are now freed from the rigidity of traditional business models.

For example, in their article “The Role of Surge Pricing on a Service Platform with Self-Scheduling Capacity,” published in 2017 in *Manufacturing & Service Operations Management*, Cachon et al. explain how the on-demand economy “transforms” the way that firms deliver service to their consumers (with emphasis added):

The firm *no longer must* centrally schedule its capacity by assigning workers to shifts. Instead, workers *may* act as independent service providers *who determine their own work schedules*, and the firm’s role becomes that of a *platform that connects providers to consumers*. Although the platform has far less control over how many providers work at any

one time, providers *gain the freedom* to “self-schedule” the hours they work, presumably allowing them to better integrate their work with the other activities in their lives.⁴⁷

Such language conveys the sense that on-demand work is an inherently benevolent development. This is reinforced, for example, by discussions of changing customer desires and demands. According to Terry Taylor, Professor of Business Administration at the Haas School of Business at the University of California, Berkeley, the independent contractor classification is necessary to meet the demands of an increasingly impatient customer base—that is, the classification is decidedly not a reflection of firms’ attempts to offload labor-related costs onto the workers themselves. Taylor writes,

Recent years have witnessed the emergence and rapid growth of platforms for on-demand services... These services are on-demand in the sense that upon experiencing a need for service, a customer desires service immediately and is sensitive to delay... A platform connects customers seeking service with independent agents that provide the service... The agent is independent in the sense that she decides whether and when to work. The platform business model is distinct from the traditional firm-employee business model, wherein the firm determines when its employees work and pays them a salary or hourly rate rather than a piece rate.

In this framing, independent contractors’ flexibility is equated with customers’ impatience as defining features of the “platform business model.” On the one hand, this obscures how central the independent contractor classification is to firms’ profitability; on the other hand, it presumes that engaging employees rather than independent contractors is somehow detrimental to the quality of service. Given that the “customer is always right,” the independent contractor classification becomes an expected and accepted evolution in the service industry—the only means of satisfying an increasingly impatient customer base.

44 Kostas Bimpikis, Ozan Candogan, and Daniela Saban. “Spatial Pricing in Ride-Sharing Networks.” *Proceedings of the 12th Workshop on the Economics of Networks, Systems and Computation*. NetEcon ’17. New York, NY, USA: ACM, 2017. <https://doi.org/10.1145/3106723.3106728>, 1.

45 Maya Kosoff. “Why the ‘Sharing Economy’ Keeps Getting Sued.” *Vanity Fair*, November 9, 2017. <https://www.vanityfair.com/news/2017/11/postmates-worker-classification-lawsuit>.

46 One exception to this is Jing Dong and Rouba Ibrahim. “Flexible Workers or Full-Time Employees? On Staffing Systems with a Blended Workforce.” *SSRN Scholarly Paper*. Rochester, NY: Social Science Research Network, 2017. <https://papers.ssrn.com/abstract=297184>, which looks at optimal workforce “blending” of full-time workers and independent contractors.

47 Cachon et al., “The Role of Surge Pricing on a Service Platform with Self-Scheduling Capacity,” 368.

4.2 “Control Levers”

The management science literature thus tends to accept firms’ narratives about worker flexibility and freedom, without questioning these premises. But what kinds of “management problems” does this research formalize “in order to help managers make better decisions”? As noted above, the most salient problem for on-demand firms is logistical—how to strike a balance between labor supply and customer demand given the constraints of worker flexibility.

According to Gurvich et al., on-demand companies have several “control levers” at their disposal to mitigate these challenges. These are strategies for finding that delicate balance in terms of *coverage*—meaning, ensuring that workers are sufficiently available—both in time (i.e., in terms of scheduling) and in space (i.e., geographically).

4.2.1 Time tools: Pool size and caps

The three “control levers” that Gurvich et al. identify include “pool size,” “compensation,” and “capping.”⁴⁸ These variables are “control levers” insofar as firms can manipulate them to effect different outcomes. Pool size refers to the total number of agents that an on-demand firm recruits and qualifies to as service providers (e.g., the total number of Uber or Lyft drivers in a given market). Compensation describes wage rates. And capping refers to limits that a company can place on the number of workers active during a given period.

Because the compensation “lever” simply reiterates arguments around dynamic wages, this subsection discusses only pool size and capping in order to discern their implications for time-based forms of control.

As Gurvich et al. note, firms have an initial incentive to attract as large a pool of workers as possible. Having a large pool of workers allows on-demand companies to “offer relatively low wages in both high and low demand periods and still induce enough agents to work.”⁴⁹ This is an attractive option to firms: “while self-scheduling is less profitable [than central scheduling], a self-scheduling firm sacrifices little when it has a large pool of agents.”⁵⁰ To translate this abstract premise into practical terms: if Uber, Lyft, Caviar, or Postmates had a large enough pool

of drivers or couriers to draw from, it could offer lower wages because among that large pool, there would inevitably be enough workers willing to work for lower earnings.

In reality, however, there is a “constraint on agent earnings,” i.e., a minimum wage threshold that must be met in order to attract a sufficient number of workers. As discussed above, firms use and monitor dynamic pricing and labor supply elasticities to determine the exact pay rates necessary to attract a sufficient volume of workers.

However, if on-demand companies have a large pool size with earnings constraints, then they will face a challenge that Cachon et al. describe as “capacity rationing”—when the number of workers available during a given period exceeds the customer demand during that period. This can lead to significant dissatisfaction amongst workers and an exodus from the platform. In response, the firm must pull another “control lever”—capping—which places a limit on the number of workers that can log on during a given period.

Capping contradicts the flexibility narrative that on-demand firms promote. In fact, Gurvich et al. highlight these contradictions in their paper. “Note that [capping] implies that agents must sacrifice some scheduling flexibility in order to guarantee a minimum compensation level.”⁵¹ More importantly, capping also violates independent contractors’ legal protections because capping dictates “how” the work is accomplished: capping tells an independent contractor that he or she cannot work during a specific period. As such, while firms may thus be prohibited from placing “hard” caps on worker schedules, in practice, they exploit their monopoly control of the platform to impose “soft” caps.

For example, through ethnographic research that I conducted while working as a courier on the on-demand food delivery platform Caviar,⁵² I learned that the company uses a scheduling system on its smartphone app. This system shows workers how many slots are available for each hour-long shift in a day. Workers also see bonuses allotted for slots that tend to be the busiest, such as during lunchtime and dinner (i.e., 11AM-1PM and 6PM-8PM, respectively). Although the Caviar managers promoted this development as granting workers better access to

48 Gurvich et al., “Operations in the On-Demand Economy,” 3.

49 Gurvich et al., “Operations in the On-Demand Economy,” 4.

50 Gurvich et al., “Operations in the On-Demand Economy,” 9.

51 Gurvich et al., “Operations in the On-Demand Economy,” 4.

52 Shapiro, “Between Autonomy and Control!”

information about time-based bonuses, the scheduling system also had a capping effect—it effectively limited the number of workers that could log on during a given period. Notably, this was not a “hard” cap—Caviar refrained from telling workers that they could not log on when they are not scheduled. Rather, the managers merely told workers that pre-scheduling yourself would guarantee that you are *prioritized* in the algorithmic queuing system. The inverse of this prioritization, however, is that workers that didn’t pre-schedule themselves were *de-prioritized*, and therefore made little in earnings. This series of incentives and disincentives illustrates what “soft” capping looks like in practice—a way for platform managers to ensure coverage when workers have the capacity to schedule themselves.

4.2.2 Space tools: Zones and surges

Whereas Caviar uses time-based scheduling to dynamically adjust pay rates, other platforms, such as Lyft, Uber, and Postmates, use geography to determine payments. These divide markets into geographical zones and modulate both customer prices and worker pay rates based on the ratio of supply to demand in the area. Firms broadcast this information to workers through the platform, typically as a map highlighting the surge areas, the goal being to attract more workers to zones with higher demand.

However, geographic dynamic pricing can have unintended effects. Because the information is presented to workers, it influences their decisions: workers may rush to get to the “surge” zone, thereby “diluting” the supply-to-demand ratio. Workers that “chase the surge”⁵³ by heading toward areas with higher wages may therefore actually earn less than if they had stayed put. A common refrain among experienced drivers is actually to avoid surge zones.

When demand is at its highest (for instance, after midnight on New Year’s Eve), the spatial distribution of workers can present new inefficiencies. In these scenarios, economists Castillo, Knoepfle, and Weyl describe a “wild goose chase” effect for ride-hailing platforms. When demand is at its most extreme, it can overwhelm worker

supply to the extent that the platform is forced to allocate rides to distant drivers. This leads to general systemic inefficiencies, including long waiting times for customers and reduced earnings for workers, who may have to travel long ways without compensation.⁵⁴

In response to these spatial inefficiencies, management science researchers have proposed alternative mechanisms for managing workers’ movements. For example, Bimpikis et al. suggest that rather than using surges to relocate drivers to higher-demand areas, they instead manipulate prices to induce what they call a “balanced” demand pattern. “A demand pattern,” they write,

is balanced if the potential demand for rides at each location is roughly the same as the number of riders with this location as their destination. For balanced networks, the price of a ride as well as the corresponding compensation for the drivers are the same irrespective of the location that it originated from. Furthermore, drivers that enter the platform remain busy throughout the time they provide service.

This optimal scenario can be induced, Bimpikis et al. argue, by “subsidizing” (i.e., lowering prices for) rides from locations that are attractive destinations and “taxing” (i.e., charging more for) those starting at locations with low demand. Computer scientists Mohammed Asghari and Cyrus Shahabi likewise propose a demand-forecasting system that prices rides according to origin-destination pairs.⁵⁵ In both cases, worker payments are adjusted according to demand patterns for the entire geographic market, rather than a localized zone.

While these strategies appear relatively benign and may even benefit workers by mitigating the “wild goose chase” scenario or “surge-chasing,” other researchers suggest more insidious approaches.

53 Harry Campbell. “Advice For New Uber Drivers: Don’t Chase The Surge!” *Maximum Ridesharing Profits* (blog), May 10, 2016. <https://maximumridesharingprofits.com/advice-new-uber-drivers-dont-chase-surge/>

54 Juan Camilo Castillo, Daniel T. Knoepfle, and E. Glen Weyl. “Surge Pricing Solves the Wild Goose Chase.” *SSRN Scholarly Paper*. Rochester, NY: Social Science Research Network, March 20, 2018. <https://papers.ssrn.com/abstract=2890666>.

55 Asghari, Mohammad, and Cyrus Shahabi. “ADAPT-Pricing: A Dynamic and Predictive Technique for Pricing to Maximize Revenue in Ridesharing Platforms,” 189–98. ACM, 2018. <https://doi.org/10.1145/3274895.3274928>.

For example, in their article for the journal *Management Science*, “Your Uber is Arriving: Managing On-Demand Workers through Surge Pricing, Forecast Communication and Worker Incentives,” Harish Guda and Upender Subramanian propose to “misreport” demand information to workers to force movement out of over-supplied zones.⁵⁶ By building on workers’ learned experience that “chasing the surge” is counterproductive and unprofitable, the researchers suggest that firms use dynamic pricing not to attract workers to particular places, but to *nudge workers out of surge zones*. Specifically, Guda and Subramanian argue that as workers learn that “chasing the surge” is futile, they become suspicious of platform information, and recommend that firms exploit this suspicion by “**misreport[ing] market forecasts to exaggerate the need for workers to move**”⁵⁷—in other words, misleading workers about the supply-to-demand ratio to get them to move where platform managers want.

This cynical approach rests on the information asymmetries between platform manager and worker. Because workers do not have access to information about market conditions, including where other workers are in relation to their present location, workers unknowingly impose a “competitive externality” on each other, which affects their likelihood of receiving a job:

Because individual workers do not internalize the competitive externality that they impose on other workers in their market zone, too few workers may leave a zone with an excess supply of workers to serve an adjacent zone that requires additional workers. The platform can make more workers move by distorting the price in the market zone with excess supply through surge pricing to deliberately choke demand. Doing so improves total platform profit across zones if the need for additional workers to move is sufficiently high.⁵⁸

The researchers thus propose to use misreporting and dynamic pricing to suppress demand—a practice that they call “demand throttling.” Demand throttling generates high wages that workers will never see. It raises prices to the point at which customers decline to request service and a more manageable supply-to-demand balance is restored. In other words, in this strategy, because the platform managers operate a two-sided market of worker-consumers and customer-consumers, firms’ desire to control worker decision-making starts to affect customer prices: both sides of the market are being manipulated, throttled, and distorted. Workers, presumably, are left to infer for themselves that it is not worth their time to be in that “surge” zone and subsequently decide to move based on their own calculations. Because workers distrust the information that the platform provides,

the platform may use a surge price to [more] credibly communicate a greater need for workers to move. Importantly, a surge price in the market zone that the workers should leave is a less costly means for credible communication (than a surge price in the zone that workers should move to).⁵⁹

This rationale is extremely disingenuous and may even be fraudulent. It suggests that, rather than communicating market conditions transparently, firms should instead manipulate—and indeed, misreport—the information available to both customers and workers to maximize their revenue. Although this may be an extreme case, it nonetheless reflects a significant lack of ethical accountability and oversight, not just in the management science literature, but also among platform managers. When the “optimal solutions” to management problems betray worker and customer trust, it is clearly time for regulatory intervention in the platform economy to ensure that both workers and customers are treated fairly and decently.

56 Harish Guda and Upender Subramanian. “Strategic Surge Pricing on On-Demand Service Platforms.” SSRN Scholarly Paper. Rochester, NY: Social Science Research Network, 2017.

57 Guda and Subramanian, “Strategic Surge Pricing”: 4.

58 Harish Guda and Upender Subramanian. “Strategic Pricing and Forecast Communication on On-Demand Service Platforms.” SSRN Report: 2895227, 2017. Available at <https://pdfs.semanticscholar.org/3e78/6efc79184c0ce6eb756c06ab4b4ca49e1e2c.pdf>.

59 Guda and Subramanian, “Strategic Surge Pricing”: 5.

5. Discussion and Conclusion

The management science literature reveals that the “control levers” available to on-demand companies are market mechanisms, while at the same time illustrating just how uneven a playing field this “market” is. Information access is wholly asymmetrical. Firms not only impose constraints and limitations that undermine the independent contractor classification; they also exclude workers from vital information. For example, if workers had access to information on the number and location of other workers in the field in real-time, this would likely alter their decisions about where or when to work. It is true that workers can impose a competitive externality on each other. However, rather than helping workers to mitigate those effects, on-demand companies instead operate in bad faith and use those externalities to pit workers against one another in a perverse blind duel. Price and payment manipulations are particularly pernicious: they impose an artificial notion of “rationality” on the worker that, in reality, corresponds better with company profits than with workers’ well-being. Just when workers become savvy to rookie mistakes like “chasing the surge,” their experience is used against them.

These asymmetries and inequities hinder workers’ efforts to improve their working conditions. To rectify this baseline inequity, workers need to organize. Only with a critical mass will workers be able to get the attention of platform managers. There are now several successful examples of on-demand worker organizing. In October 2016, Italian workers on the Germany-based Foodora platform mobilized a strike outside the company’s Italian headquarters; in September 2018, UberEats couriers protested pay rates in Central London and drew traffic to a halt.⁶⁰

In future actions, workers should demand significantly greater access to information. Every “control lever” that firms have at their disposal hinges on workers’ exclusion from information. By targeting those “control levers” as sites of intervention, workers may be able to, first, demonstrate that the platform’s exclusions constitute unfair trade practices, and second, make demands on firms that significantly improve their earnings and quality of work.

5.1 Tactical Recommendations

- **Wage rates and elasticity**

Workers should demand access to information about on-demand companies’ payment policies and procedures and even hire independent experts to evaluate and audit platforms. The goal is to gain access to how firms set their baseline wage-rates, how those rates are affected by demand fluctuations, and whether the baseline wage is being suppressed to make “surge” prices more attractive.⁶¹

- **Pool size**

Workers should demand that companies decrease the size of the worker pool. With enough workers, companies become immune to worker protests because they have replacements “on standby” to fill in. Large pools can also lead to wage suppression.

60 Arianna Tassinari and Vincenzo Maccarrone. “Striking the Startups.” *Jacobin*, January 23, 2017. <https://jacobinmag.com/2017/01/foodora-strike-turin-gig-economy-startups-uber>; Haroon Siddique. “Uber Eats Couriers’ Pay Protest Brings Traffic to a Halt in Central London.” *The Guardian*, September 20, 2018, sec. Technology. <https://www.theguardian.com/technology/2018/sep/20/uber-eats-couriers-pay-protest-brings-traffic-to-a-halt-in-central-london>.

61 If demanding changes to payment policies, workers should refer to Jiaru Bai, Kut C. So, Christopher S. Tang, Xiqun Chen, and Hai Wang. “Coordinating Supply and Demand on an On-Demand Service Platform with Impatient Customers.” *SSRN Scholarly Paper*. Rochester, NY: Social Science Research Network, 2017. <https://papers.ssrn.com/abstract=2831794>, in addition to Bimpikis et al., “Spatial Pricing in Ride-Sharing Networks” and Cachon et al., “The Role of Surge Pricing on a Service Platform with Self-Scheduling Capacity.” Each of these papers discusses *dynamic commission rates*, i.e., firms adjusting their fees collected from transactions. In practice, it appears that most on-demand firms use a fixed commission rate (e.g., 10-20% of what workers are paid). Workers could demand either that companies modulate the commission rate to ensure that workers get a greater share of revenue during slow periods or that companies lower the commission rate altogether.

- **Caps**

Workers should demand that companies disclose their worker caps, whether “hard” or “soft.” This information can be used to reverse engineer firms’ demand forecasts, which could be used strategically, for instance, by orchestrating an action to demand higher wage rates during those hours.

- **Geographies**

Workers should demand payment for the time and resources spent relocating to areas with higher concentrations of demand. Companies should compensate workers who travel to “surge zones” but do not receive a work order once they arrive. Rather than increasing opacity by “misreporting,” as Guda and Subramanian suggest, companies should instead increase transparency—for instance, by showing how many other workers are likely headed in the same direction.

5.2 Concluding remarks

Flexibility and autonomy are attractive to workers for good reason. But they can also be weaponized. The “science” of worker control exploits and proliferates already-precarious working conditions. On-demand companies dangle the possibility of flexibility to justify their exploitative classification of workers as independent contractors, at the same time manipulating pay rates and information access. Workers should appropriate the management science literature as a guide to these manipulations and use that knowledge to advocate for a more level playing field.