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Racism Pays: How Racial Exploitation Gets Innovation Off the Ground

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ABSTRACT

Recent work on the history of capitalism documents the key role that racial exploitation played in the launch of the global cotton economy and the construction of the transcontinental railroad. But racial exploitation is not a thing of the past. Drawing on three case studies, this Paper argues that some of our most celebrated innovations in the digital economy have gotten off the ground by racially exploiting workers of color, paying them less than the marginal revenue product of their labor for their essential contributions. Innovators like Apple and Uber have been able to racially exploit workers of color because they have monopsony power to do so. Workers of color have far fewer outside options than white workers, owing to intentional and structural discrimination against workers on the basis of their race. In the emerging digital economy, racial exploitation has paid off by giving innovators a workforce that is cheap, easy to scale, flexible, and productive—the kind of workforce that is especially useful in digital markets, where a first-mover advantage often translates to winner-take-all. This Paper argues that these workers should be paid the marginal revenue product of their labor, and it proposes a number of potential ways to do so: by increasing worker compensation or worker power. More generally, I argue that we should value the essential contributions of workers of color and immigrant workers who make innovation possible.

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[*] Richard J. and Antoinette L. Kirtland Professor of Law, University of Southern California Gould School of Law. Special thanks for commentary and engagement to Scott Altman, Guy Uriel Charles, Veena Dubal, Suresh Naidu, Eric Posner, Michael Reich, Matt Spitzer, and participants at The University of Chicago Law School Legal Theory Workshop, The Yale Law School Public Law workshop, and Brown University Economics Department theory workshop.

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I. INTRODUCTION

Al Castillo, age 33, lives in New York, one of the most expensive cities in the country if not the world. Castillo doesn't have a traditional job. Instead, he works out of his Honda Pilot, driving full time for ridehail companies like Uber, Lyft, and Juno. Castillo works six days a week, nine to eleven hours a day, and brings $250 home on a typical day.[1] Over the course of a typical year, he gets paid $72,000 from rides before taxes. He pays about $17,000 of that towards maintenance on his car and other job-related expenses. That amount doesn't include the car payment on his $40,000 new car. He also pays taxes on his earnings.

The more rides he completes, the more he gets paid. "You want to be busy all the time," he says. "Our time is money." Castillo rarely takes a break during his day. He takes bathroom breaks once or twice a day and might pull over once more to stretch his legs. Castillo often doesn't stop for a meal or eat during his entire shift. Breakfast today was filling.[2]

Al Castillo and other immigrant, Black, and brown drivers like him make up around 70% of full-time drivers (and over 50% of part-time drivers).[3] This full-time driver group is the ridehail industry's secret weapon—they are the glue that holds the driver network together.[4] Though they make up a relatively small share of all drivers, they make up a larger fraction of drivers who are actively driving and supply over 50-

1. Kathleen Elkins, *A Day in the Life of an Uber, Lyft and Juno Driver*, CNBC (Jan. 31, 2019), https://www.cnbc.com/2019/01/30/a-day-in-the-life-of-a-full-time-uber-lyft-and-juno-driver-in-nyc.html.

2. *Id*.

3. TIME Magazine, Burston Marsteller and Aspen Institute Future of Work Initiative, *The On-Demand Economy Survey*, ASPEN INST. (June 21, 2016), https://www.aspeninstitute.org/publications/demand-economy-survey/(full slides on file with the author). Racial minorities make up 55% of digital economy workers and 67% of motivated workers, who are far more likely (44% vs 11%) to supply ridesharing services. Racial minorities make up 49% of casual workers. *Id*. at 7, 18.

4. A study conducted by researchers at UC Santa Cruz found, from a representative cross-sample of drivers actually working, 71% of digital platform ridehail and delivery drivers worked more than 30 hours a week, 50% worked more than 40 hours, and 30% worked more than 50 hours a week. Chris Benner, *On Demand and On the Edge: Ridehailing and Delivery Workers in San Francisco*, S.F. LOC. AGENCY FORMATION COMM'N 21 (May 2020), https://transform.ucsc.edu/wp-content/uploads/2020/05/OnDemand-n-OntheEdge_MAY2020.pdf. 78% of these drivers are racial minorities and 56% are immigrants. *Id*. at 8, 11, 14. Uber's own research estimates full time drivers at around 50%. Jonathan V. Hall & Alan B. Krueger, *An Analysis of the Labor Market for Uber's Driver-Partners in the United States*, 71 ILR REV. 705 (2018). According to a Seattle study, the 33% of drivers who worked more than 32 hours per week accounted for 55% of trips; JAMES A. PARROT & MICHAEL REICH, A MINIMUM COMPENSATION STANDARD FOR SEATTLE TNC DRIVERS, REPORT FOR THE CITY OF SEATTLE (July 2020), https://irle.berkeley.edu/files/2020/07/Parrott-Reich-Seattle-Report_July-2020.pdf.

55% of the ride volume and industry revenue.[5] Without drivers like Al, the driver network would collapse, and passengers would have to wait for hours to secure an off-period ride.[6] These workers are the network hubs that make the driver network hang together.

But even though they are the beating heart of the ridehail business model, these drivers make little money once expenses are factored in. In a study of Uber data from 2015-2017, the Economic Policy Institute concluded that Uber drivers earned on average $9.21 per hour, which falls below the minimum wage in thirteen of the twenty major urban markets where Uber makes most of its money.[7] Low wages lead to other dire consequences. One out of five drivers have no health insurance. Almost half of drivers could not handle a $400 emergency expense.[8]

Once these drivers figure out how low their earnings are, they exit quickly—more than 60% of drivers are no longer driving within six months.[9] Unhappily for drivers, ridehailing firms respond to these high quit rates not by increasing wages but by replacing drivers with an always-growing pool of replacement drivers. As I will discuss below, the ease with which ridehails churn through workers is part of their business model. Ridehail firms treat drivers as expendable.

Al Castillo says he might look for another job soon because his wages have been dropping, but he hasn't had much luck in the traditional labor market. The only jobs he's been able to find don't earn enough money to pay the rent.[10] State and local minimum wages don't apply to Castillo because he is an independent contractor, which means he doesn't have the same legal protections as an employee.

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5. PARROT & REICH, *supra* note 4, Exhibits 13, 17 (drivers of color make up 55% of drivers in Seattle; full-time drivers provide 55% of trips).

6. Michelle Cheng, *Can Uber Lure Back its US Drivers without Making Them Full-time Employees?*, QUARTZ (May 15, 2021), https://qz.com/2013562/uber-wants-more-full-time-workers-as-it-faces-a-driver-shortage/. As of May 2021, Uber had begun to prioritize the recruitment of full-time drivers, recognizing their central contribution to the driver network.

7. LAWRENCE MISHEL, UBER DRIVERS' COMPENSATION, WAGES, AND THE SCALE OF UBER AND THE GIG ECONOMY, ECONOMIC POLICY INSTITUTE 2, 15 (2018), https://www.epi.org/publication/uber-and-the-labor-market-uber-drivers-compensation-wages-and-the-scale-of-uber-and-the-gig-economy/. EPI calculated this rate by taking Uber data on earnings before expenses and then subtracting Uber's fees and commissions, drivers' vehicle expenses, and a benefits package (nonwage benefits and social insurance payroll taxes) that drivers would have to purchase on their own to secure the average benefits received by other workers.

8. Benner, *supra* note 4, at 16.

9. Cody Cook, Rebecca Diamond, Jonathan Hall, John A. List & Paul Oyer, *The Gender Earnings Gap in the Gig Economy: Evidence from over a Million Rideshare Drivers*, 88 REV. ECON. STUD. 2210, 2218 (2021).

10. Elkins, *supra* note 1.

This Paper argues that racial exploitation pays off handsomely for innovators in the emerging digital economy like Uber and DoorDash. Workers like Al Castillo are vulnerable to a modernized form of racial exploitation that provides distinctive payoffs to innovators in the digital economy. Many of today's innovators have gotten their projects off the ground in large part because they have monopsony power to pay workers of color less than their marginal revenue product. These innovators use that power to exploit workers of color, paying them less than a competitive market wage to work full time, on demand, in onerous working conditions, and for no benefits.

The idea that racial exploitation has made innovation possible is not a new one. Building on earlier work by W.E.B. Dubois and Cedric Robinson, recent work by economic historians documents the key role that racial exploitation played in the launch of the global cotton economy and the construction of the transcontinental railroad.[11] Cotton growers and railroad owners were able to launch one of the earliest industrialized economies on the backs of enslaved African workers.[12] The transcontinental railroad was completed in record time because railroad owners indentured Chinese workers.[13] Even earlier, the production of sugar in British colonies, which helped to finance the American colonies, depended on a growing trans-Atlantic slave trade.[14]

Historically, racial exploitation worked through brutal restriction of people's lives. Violence and the rule of law ensured that workers were not free. Slaves were chattel property and under the complete control of their masters.[15] Indentured workers were legally bound through contract

11. *See* SLAVERY'S CAPITALISM: A NEW HISTORY OF AMERICAN ECONOMIC DEVELOPMENT (Sven Beckert & Seth Rockman eds., 2016); HISTORIES OF RACIAL CAPITALISM (Destin Jenkins & Justin Leroy eds., 2021).

12. *See* SVEN BECKERT, THE EMPIRE OF COTTON: A NEW HISTORY OF GLOBAL CAPITALISM (2015).

13. *See* DAVID HAWARD BAIN, EMPIRE EXPRESS: BUILDING THE FIRST TRANSCONTINENTAL RAILROAD (1999); *see* GORDON CHANG, GHOSTS OF GOLD MOUNTAIN: THE EPIC STORY OF THE CHINESE WHO BUILT THE TRANSCONTINENTAL RAILROAD (2019); *see* Barbara Voss, *The Historical Experience of Labor: Archaeological Contributions to Interdisciplinary Research on Chinese Railroad Workers*, 49 Hist. Archaeology 4 (2015).

14. *See* WALTER JOHNSON, SOUL BY SOUL: LIFE INSIDE THE ANTEBELLUM SLAVE MARKET (2001); *see also* MARC ARONSON & MARINA BUDHOS, SUGAR CHANGED THE WORLD: A STORY OF MAGIC, SPICE, SLAVERY, FREEDOM, AND SCIENCE (2010).

15. *See* Beckert, *supra* note 12; *see* EDWARD BAPTIST, THE HALF HAS NEVER BEEN TOLD: SLAVERY AND THE MAKING OF AMERICAN CAPITALISM (2016); *see* WALTER JOHNSON, RIVER OF DARK DREAMS: SLAVERY AND EMPIRE IN THE COTTON KINGDOM (2013).

to work to repay the often-inflated cost of transport to their employer or middleman.[16]

But even though those legal rules are long gone, racial exploitation is not a thing of the past. Workers of color are still not free, certainly not as free as whites, to move to other jobs and other employers. This Paper makes an original contribution by proposing a very specific definition of racial exploitation, one that links an employer's coercive power to the absence of options that would otherwise enable workers to switch jobs in a competitive labor market. As this Paper will discuss, racial discrimination distinctively restricts the outside options of immigrant workers and workers of color. Individuals are less likely to be recruited or hired because of intentional or subconscious racial or ethnic discrimination. Job search networks are likewise restricted, containing fewer contacts employed in high-wage jobs with opportunity for advancement. The Paper will review empirical research suggesting that, owing to individual and structural discrimination, workers of color have fewer outside employment options because of their race, and that they are vulnerable to exploitation as a result.[17]

The digital economy stands as the economic answer to the slow but inexorable decline in manufacturing profitability in the United States. Data and information have become the "new oil," the way to jump start economic growth.[18] As the Paper will show, innovators in this space rely on a particular kind of workforce to get their innovations off the ground. In digital markets, firms engage in a different kind of competition: for example, owing to the self-reinforcing dynamics of network markets, capturing the first-mover advantage becomes key, as early success translates to later success in a winner-take-all campaign. To that end, digital economy innovators often engage in explosive growth early on, even in the face of uncertain demand.[19]

Such competition requires a different kind of workforce—one that is expendable and expandable, easy to scale up (and down) at a moment's notice, and at very low cost.[20] The case studies described below suggest that racial exploitation may have played an important role in fielding the kind of workforce tailor-made for digital innovation.[21] Innovators were able to exploit workers of color and immigrant workers because they had fewer outside options owing to intentional and structural discrimination, as described above.

16. *See* Voss, *supra* note 13.

17. *Infra* Part IIA.

18. NICK SRNICEK, PLATFORM CAPITALISM (THEORY REDUX) 6 (2017).

19. *Infra* Part IVC.

20. *Infra* Part IV.

21. *Infra* Part III.

- In the 70s and 80s, as Apple developed the Mac, it exploited Asian and Latine immigrant women by paying them (and often their family members) pennies per piece to assemble electronic circuit boards in vendor sweatshops or in their home kitchens. These women suffered long-term effects of exposure to toxic chemicals, but firms disclaimed responsibility because the women were contract piece-workers. These workers had few options other than lower-paying agriculture work in the region.
- In 2010, Uber and Lyft developed the digital ridehail model by exploiting immigrant and drivers of color, relying on them to drive full-time but paying them subminimum wages and no benefits. In an effort to capture a first-mover advantage, ridehails used these drivers to fuel dramatic growth and then slashed prices as they engaged in a price-war with each other to maintain (or capture) market share.
- Most recently, the ImageNet object recognition project racially exploited "ghost workers" from the Global South to advance the artificial intelligence and machine learning that make self-driving cars possible. Unable to use expensive U.S. workers, ImageNet exploited ghost workers from India to work full time labeling the data used to train AI and machine learning algorithms to recognize objects. Having no other local options, workers were willing to work for a dollar an hour or less on Amazon's Mechanical Turk ("MTurk"), an electronic piecework job board run by Amazon.

Drawing from these case studies, I argue that racial exploitation produces distinctive payoffs for today's digital innovators. Exploiting immigrant workers and workers of color produces the kind of workforce that generates competitive advantage for digital startups:

- Advantages in scale and time. Innovators could scale up a workforce at a moment's notice, given the large reserve of workers of color. "Blitzscaling"—explosive growth to capture the first-mover advantage—has become a key strategy for digital innovation, and workers of color facilitate this rapid and flexible growth. Innovators have also completed their innovations in record time, owing to the availability of workers of color at low cost.
- Higher productivity for lower costs. Given the lack of outside options for workers of color, innovators were able to avail themselves of a full-time workforce for part-

time pay and non-existent benefits; when workers quit, innovators could quickly replace them rather than improving wages or conditions. Innovators like Uber and Lyft could engage in price-wars by slashing wages without risking a major loss of workers.

- An up-and-running system of exploitation. Workers of color have already been rendered vulnerable to exploitation by past discrimination and structural discrimination. This system has become self-reinforcing over time, in part because past exploitation begets future exploitation. Digital innovators don't need to invent a functioning system from scratch.

These payoffs from racial exploitation are not incidental to the digital innovation business model—they are the business model. As CrowdFlower's CEO Lukas Biewald has explained:

> Before the Internet, it would be really difficult to find someone, sit them down for ten minutes and get them to work for you, and then fire them after those ten minutes. But with technology, you can actually find them, pay them a tiny amount of money, and then get rid of them when you don't need them anymore.[22]

This Paper argues that racial exploitation has made Biewald's ideal workforce possible. Because workers of color have fewer outside options, they are less likely to quit, and more likely to sign up for the kinds of jobs Biewald describes.

This Paper concludes by arguing that workers of color should be compensated at a wage equal to the marginal revenue product of their labor: the wage that would be paid if the labor market were competitive. Mindful of the need for more research on both racial exploitation and the conditions in which we find it, I explore categories of remedies that might ensure workers get paid the value of their labor. Here, I investigate a range of proposals by other scholars, with an eye towards tailoring them to remedy racial exploitation.

Given that exploited labor plays a key role in innovation, some of the categories I explore include deferred compensation or equity options so as to enable both continuing innovation and compensation. Given

22. Moshe Marvit, *How Crowdworkers Became Ghosts in the Digital Machine*, THE NATION (Feb. 5, 2014), https://www.thenation.com/article/how-crowdworkers-became-ghosts-digital-machine/; Commonwealth Club of California, *Crowdsourcing,* YOUTUBE (Mar. 11, 2010), https://www.youtube.com/watch?v=lxyUaWSblaA (discussing, starting at 3:14, the internet's role in facilitating rapid hiring and firing).

workers' investment of labor and suppressed wages, compensation and equity proposals are not redistributive proposals—they are restitutionary. More generally, the core idea is that society ought to properly value the essential contributions of immigrant workers and workers of color to the digital economy.

Part 2 explores the definition of racial exploitation that this Paper adopts: workers are exploited when employers fail to pay them the marginal revenue product of their labor. This Part reviews recent theoretical and empirical work by economists that links the opportunity for worker exploitation to worker outside options. Part 3 lays out the three case studies described above, narrating the stories of innovators who switched to (or started with) workers of color in order to gain a competitive advantage in the emerging digital economy.

In Part 4, drawing from the case studies described above, I identify the way in which racism pays off for innovators in the digital economy space. Here, I argue that racial exploitation offers innovators a reserve workforce that meets the need for flexibility (easy to hire and fire) in early-stage innovation. In Part 5, I explore three general categories of intervention that focus on paying workers the value of their contributions to innovation and giving them choices about how they are compensated. Here, I discuss wage subsidies financed via tax and transfer, wage boards, and equity-focused forms of deferred compensation. Part 6 concludes.

II. RACIAL EXPLOITATION

Recently, academics have witnessed a dramatic revival of interest in studying the power of employers to exploit workers.[23] These scholars conduct high quality experiments and analyze extensive data, now newly available from a wealth of sources, to assess the degree of power that employers in real-world markets have to exploit workers.

When modern labor economists talk about exploitation, they adopt the neoclassical concept of exploitation that can be traced to British economist Arthur Pigou: workers are exploited when their real wages do not equal the marginal revenue product of their labor—the value of the work in terms of the additional revenue that an additional worker will make for the employer.[24] This Paper adopts the same definition: an em-

23. Alan Manning, *Monopsony in Labor Markets: A Review*, 74 ILR 3, 3 (2021); Orley Ashenfelter, Henry Farber & Michael Ransom, *Labor Market Monopsony* 28 J. LAB. ECON. 203 (2010).

24. ARTHUR C. PIGOU, THE ECONOMICS OF WELFARE 555, 555-60, 883-84 (1924) (some have criticized this definition because the gap between wage and marginal revenue product might not be traceable to deliberate actions by the employer). *See* ALLAN M. CARTTER, THEORY OF WAGES AND EMPLOYMENT 65-70 (1969). Pigou himself separated

ployer exploits a workforce if the employer does not pay the workforce the marginal revenue product of their labor.[25]

The following discussion first outlines this emerging body of literature on worker exploitation that empirically investigates mechanisms of worker exploitation. I then extend that analysis to argue that workers of color and immigrant workers are vulnerable to exploitation for distinctive reasons associated with race and racism.

A. *Exploitation and Suppressed Wages*

Wages and working conditions depend on the competitiveness of the market and the supply of workers, and worker outside options. In a perfectly competitive labor market, wage rates will converge towards the value to an employer in terms of additional revenue of hiring one more worker (the "marginal revenue product of labor").[26] Joan Robinson explains why the competitive market reaches an equilibrium wage that is equal to marginal revenue product. When the wage is higher than the marginal revenue product of labor, employers won't hire, and workers will offer themselves for lower wages. When the wage is lower than the marginal revenue product, in a competitive market, workers won't offer their labor and employers will offer higher wages. Thus "the wage settles at the level corresponding to the marginal productivity of the available labor force . . . ."[27]

We can measure the power of an employer to exploit workers ("monopsony power") by investigating quit elasticities: measurements of the likelihood that workers will quit their jobs when their wages change. Imagine that an employer drops wages 1% below the market level of the marginal revenue product of labor. In the world of theory, where the labor market is perfectly competitive, the market is infinitely elastic: any drop in wages will produce an instantaneous loss of all workers as they move freely to other higher-paying competitors or quit.[28] Lower rates of

out the technical definition of exploitation from notions of unfairness, and did not conflate the two; Joseph Perksy & Herbert Tsang, *Pigouvian Exploitation*, 56 REV. ECON & STATS. 52, 52 n.1 (1974).

25. Joan Robinson, *Marginal Productivity*, 2 INDIAN ECON. REV. 75, 77 (1967).

26. ALAN MANNING, MONOPSONY IN MOTION: IMPERFECT COMPETITION IN LABOR MARKETS (2003); Robinson, *supra* note 25, at 77; Sydnee Caldwell & Oren Danieli, *Outside Options in the Labor Market* (2022), https://sydneec.github.io/Website/Caldwell_Danieli.pdf. Note that Manning and other modern scholars refer to the power to exploit as monopsony power, even when the labor market is thick. *See* Suresh Naidu & Eric Posner, *Labor Monopsony and the Limits of the Law*, 57 J. HUM. RES. S284 (2022).

27. Robinson, *supra* note 25, at 77.

28. MANNING, *supra* note 26, at 3 (in Manning's thought experiment, wages drop by only one cent); *see also* Naidu & Posner, *supra* note 26.

separation show a relatively inelastic market, in which workers will not respond to reductions in wages. Scholars can experimentally or observationally measure this rate of responsiveness to wage changes, called the quit elasticity.

Burdett and Mortenson were the first to show that quit elasticities are a measure of an employer's power to exploit workers by setting wages below the marginal revenue product.[29] On their view, the neoclassical model with its infinitely large quit elasticity indicates a competitive market in which employers are wage-takers, because they do not have the power to exploit. Conversely, smaller numbers (typically <10) indicate employers who are wage setters, because they have the power to set wages lower than the marginal revenue product in order to maximize profits.

A number of recent empirical investigations of quit elasticities show that in fact, in the real-world, labor markets are not perfectly competitive, and most labor markets are not infinitely elastic. Experimental research suggests that frictions in worker search and worker mobility may confer on employers the power to set wages below market levels.[30] Likewise, observational analyses show that market restraints and idiosyncratic worker preferences enable employers to routinely set wages from 20 to 60% below the marginal product revenue of worker labor.[31]

Market restraints can come from many sources. The local labor market might have a limited number of employers, or the market might be concentrated nationally because only a few employers dominate the market. Workers might not be able to effectively search for outside jobs or might face discrimination even when they do locate such jobs. If workers lack outside options, they may remain at their jobs even when wages drop and/or when the workforce is paid less than the marginal revenue product of its labor.

In the presence of these market frictions, an employer can maximize profits by paying only the wage that workers (at that quantity level) are willing to work for, as opposed to the marginal revenue product of workforce labor. When workers are less likely to leave jobs, employers have the power to exploit workers by suppressing wages without triggering worker exit.

The following discussion explores in more detail a range of market frictions that can confer the power to exploit. Market concentration means that workers have fewer employers to whom they can flee to if

29. Kenneth Burdett & Dale T. Mortensen, *Wage Differentials, Employer Size and Unemployment*, 39 INT'L ECON. REV. 257, 258 (1998).

30. *Id.* at 257 (reviewing earlier empirical work).

31. Suresh Naidu & Michael Carr, *If You Don't Like Your Job, Can You Always Quit? Pervasive Monopsony Power and Freedom in the Labor Market*, 3(1) J. L. POL. ECON. 131, 136 (2022).

their wages drop below the marginal revenue product of labor. Market restraints like the inability to efficiently search for other jobs also limit worker mobility and give employers power. Increasing returns in digital platform labor markets lock workers into the most popular platform, which limits workers' ability to switch platforms if their wages are cut. The following discussion considers each in turn.

1. Market Concentration and the Power to Exploit

Market concentration can confer on employers the power to exploit.[32] If a pool of workers has only one potential employer or a limited number of employers, employers have more power to suppress wages because workers have fewer employers from which to choose, limiting their outside options.

This power from market concentration bears a resemblance to monopoly power, when buyers must buy from only one seller or a limited number of sellers and end up paying higher prices. In a monopoly, the monopolist faces a downward sloping demand curve and can set the price. In concentrated labor markets, the employer faces an upward sloping supply curve, and likewise can be a wage-setter rather than a wage-taker.[33]

Recent research suggests that markets are much more concentrated than previously thought. Azar et al. find that an average labor market defined by a relatively narrowly defined occupation and commuting area has the equivalent of 2.3 firms engaged in recruiting labor for the defined market.[34] The impact of such concentration on wages is significant—another study by some of the same scholars shows that moving from the twenty-fifth to seventy-fifth percentile in labor market concentration is associated with a 5% (OLS) to 17% (IV) decline in wages.[35] Just as sellers with monopoly power can charge above-market prices, employers with monopsony power can suppress wages.

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32. The most recent generation of scholars on the power to exploit refers to this power as monopsony power, whether or not it comes from market concentration and a limited number of employers. Because this use of the term engenders confusion among an older generation of scholars (as I discovered in a talk I gave to the Economics Department at Brown University), I restrict the term to its traditional use, and describe everything else as the power to exploit.

33. Ashenfelter et al., *supra* note 23, at 204; Benmelech et al., *Strong Employers and Weak Employees: How Does Employer Concentration Affect Wages?* 57 J. HUM. RES. 200, 201 (2020); *see also* Azar et al., *Labor Market Concentration* 57 J. HUM. RES. 67, 170 (2020).

34. Jose Azar, Ioana Marinescu, Marshall Steinbaum & Bledi Taska, *Concentration in U.S. Labor Markets: Evidence from Online Vacancy Data*, 66 LAB. ECON. 101886, 101886 (2020).

35. *Id.*

2. Market Restraints and the Power to Exploit

Much of recent empirical research on the power to exploit shows that market frictions are an important source of employer power to set wages. As far back as the 1930s, scholars like Joan Robinson and Lloyd Reynolds argued that frictions like worker lack of information about better jobs, worker preferences for particular jobs, and commuting costs could hinder workers from moving easily to a higher-wage job.[36] As the discussion below will show, in the modern framework, scholars argue these market restraints offer employers the same kind of monopsony power to set wages below market-levels.

Some of the most important wage-suppressing frictions relate to job search. Analysis of data on worker search strategies suggests that limits on worker search are associated with lower wages. Recent empirical work by Caldwell and Harmon shows that greater worker access to information about outside options from their professional network is associated with both job mobility and higher wages.[37]

This study measured a worker's outside options by reconstructing a worker's network of former co-workers and identifying the open positions at those co-workers' current firms (these are jobs that our worker is more likely to hear about). Researchers then evaluated the effect of variation in these "open position" outside options on worker movement to another job and on worker renegotiation for higher wages at the same job. Caldwell and Harmon found that an increase in the number of open positions in worker networks is associated with (i) greater job mobility to higher-paying jobs at a former co-worker's new firm and (ii) higher retention wages at the existing job.[38]

Other wage-suppressing frictions have to do with worker preferences for certain kinds of non-wage features of a job. In addition to wages, workers value jobs with regard to the type of work, the commute times, health care and retirement benefits, job safety, and personal relationships with colleagues. All constitute dimensions on which workers differentiate between jobs.[39] Joan Robinson and others have noted that women are more likely to reject jobs that involve significant commutes

36. Joan Robinson, *The Economics of Imperfect Competition* 269 (ed. 1933); Lloyd Reynolds, *The Supply of Labor to the Firm*, 60 Q. J. ECON. 390, 393 (1946).

37. Sydnee Caldwell & Nikolaj Harmon, *Outside Options, Bargaining, and Wages: Evidence from Coworker Networks in Essays on Imperfect Competition Lab. Mkt* (December 19, 2019) (Ph.D. dissertation, Massachusetts Institute of Technology) (Upjohn Inst. for Employment Research); Richard Rogerson, Robert Shimer & Randall Wright, *Search Theoretic Models of the Labor Market: A Survey*, 43 J. ECON. LITERATURE 959, 959 (2005) (reviewing research on monopsony power associated with limits on worker job search ability).

38. Caldwell & Harmon, *supra* note 37; Rogerson et al., *supra* note 37.

39. Naidu & Posner, *supra* note 26.

or extended travel, owing to the greater domestic obligations that women face in family care.[40]

3. Exploitation and Increasing Returns in Digital Markets

Some wage-suppressing market restraints are features of particular types of labor markets. Importantly for this Paper, digital platforms are more likely to be the site of significant inequality, racial and otherwise. Digital platform product markets are more likely to result in concentrated market power because product markets are frequently characterized by increasing returns, downward sloping demand curves, and winner-take-all dynamics.[41] Likewise, digital platform labor markets are potentially more likely to be characterized by upward sloping supply curves, enabling employers to set wages.[42]

Because they feature increasing returns, digital platforms lock drivers into the most popular digital platform and restrict their ability to switch platforms easily. To see why, consider the supply curve for a ridehail firm like Uber. The more drivers who work for Uber, the more customers are likely to choose Uber because they will wait less time for a ride. In turn, the more customers who choose Uber, the more likely drivers are to drive for the platform in order to increase their hours and profitability. Thus, each increase in drivers triggers an increase in customers, which in turn gives rise to a further increase in drivers, and so on. This upward sloping supply curve allows employers to set wages, in part because drivers won't want to lose access to the greater number of customers.

This intuition is consistent with recent empirical work on ridehails' power to exploit. Caldwell and Oehlsen studied ridehail drivers who had both Uber and Lyft apps on their phone. Uber drivers' wages were dropped by 10%, to observe what fraction of drivers would switch to Lyft. Although switching apps was very easy, only 20 to 40% of workers made the switch, far from what one would expect to see for a competitive market.[43]

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40. Robinson, *supra* note 25; MANNING, *supra* note 26, at 193; Sydnee Caldwell & Emily Oehlsen, Gender Differences in Labor Supply: Experimental Evidence From the Gig Economy (July 2022) (unpublished manuscript) (https://sydneec.github.io/Website/Caldwell_Oehlsen.pdf).

41. Dominique Guellec & Caroline Paunov, *Digital Innovation and the Distribution of Income*, (Nat'l Bureau of Econ. Rsch., Working Paper No. 2398, 2017), https://www.nber.org/system/files/working_papers/w23987/w23987.pdf.

42. Naidu & Posner, *supra* note 26.

43. Caldwell & Oehlsen, *supra* note 40; *see also* M. Keith Chen & Michael Sheldon, Dynamic Pricing in a Labor Market: Surge Pricing and Flexible Work (Dec. 11, 2015) (unpublished manuscript) (https://www.anderson.ucla.edu/faculty_pages/keith.chen

Dube et al. found similar results for workers on MTurk. Their study randomly varied the wages they offered for tasks on MTurk, both in the initial posting and in offers for additional work of the same type, to observe whether workers would quit in response to wage drops or low wages. This study found that workers were remarkably insensitive to wage differences.[44]

4. How Racism Increases Employer Power to Exploit Workers of Color

For the last forty-five years, Black job seekers have been about half as likely to secure employment during a consecutive four-week period as white job seekers, across all age cohorts, at every level of education, and for men and women alike.[45] Similar statistics show employment gaps among white and Latine workers.[46] As we will see, this gap in ability to secure employment has significant implications for the competitiveness of the labor market, and for employers' ability to exploit workers of color.

A small but important literature investigates employer power to exploit workers of color in ways that are distinctively associated with race. The theoretical idea here is a simple one: if workers of color are unlikely to quit or reduce hours in response to wage changes, then employers who hire workers of color can maximize their profits by paying workers less than their marginal revenue product without triggering worker exit.[47]

Available data supports this notion. Several studies from the 80s making use of national longitudinal survey data concluded that after controlling for personal and job characteristics, young Black workers are less

/papers/SurgeAndFlexibleWork_WorkingPaper.pdf) (reporting labor market supply elasticity of .15 based on data of changes in supply before and after surge pricing).

44. Arin Dube et al., *Monopsony in Online Labor Markets*, (Nat'l Bureau of Econ. Rsch., Working Paper No. 24416, 2018) (calculating an extremely low quit elasticity of .14 for MTurk, which indicates that workers are highly vulnerable to aggressive wage suppression on the platform).

45. Jhacova Williams & Valerie Wilson, *Black Workers Endure Persistent Racial Disparities in Employment Outcomes*, Economic Policy Institute Report (Aug. 27, 2019), https://www.epi.org/publication/labor-day-2019-racial-disparities-in-employment/(analyzing Current Population Survey microdata from the US Census Bureau).

46. Marie T. Mora & Alberto Dávila, *The Hispanic-white Wage Gap has Remained Wide and Relatively Steady*, Economic Policy Institute Report (July 2, 2018), https://www.epi.org/publication/the-hispanic-white-wage-gap-has-remained-wide-and-relatively-steady-examining-hispanic-white-gaps-in-wages-unemployment-labor-force-participation-and-education-by-gender-immigrant/ (controlling for education narrows the gap significantly for Hispanic men (to 14.9%) and white men but not for Hispanic women (33.1%)).

47. Naidu & Carr, *supra* note 31; MICHAEL REICH, RACIAL INEQUALITY: A POLITICAL-ECONOMIC ANALYSIS 210-12 (1981).

likely to quit in response to lowered wages than young white workers.[48] Similarly, historical research on Black and white workers at the Ford Motor Company found that Black workers were less likely to quit even though they were paid less and were disproportionately assigned to the least desirable and most dangerous jobs on the floor.[49]

More modern data analysis indicates both that employers have the power to exercise racial exploitation and that they use such power. One study found significant wage differences between Black and white nurses, even during periods in which the country has experienced significant nursing shortages. Importantly, observed racial wage gaps were largest among non-union nurses, and disappeared almost entirely among union nurses, suggesting that these racial differences can be traced to differences in worker ability to bargain.[50]

Most recently, data on quit elasticities suggest that employers have more power to exploit workers of color and immigrant workers than white workers. Research shows that quit rates and quit elasticities are, on average, 75% to 80% lower for workers of color.[51] A recent study by Carr and Naidu uses national data from the Survey of Income and Program Participation to investigate racial and gender variation in quit elasticities. This study estimates the probability of quitting each month in response to a 1% increase in wages, for a given residual wage level measured during the previous month (and controlling for human capital, age, education, and geographic factors).[52]

The authors find that historically disadvantaged groups, including women, Latines, and African-Americans, are less likely to quit in response to changes in wages or job conditions.

Black workers are half as likely to quit relative to white workers, and Latine workers roughly 25% less likely to quit relative to white workers. Carr and Naidu conclude from these smaller quit elasticities associated with race and gender that employers have significantly more

48. Francine D. Blau & Lawrence M. Kahn, *Race and Sex Differences in Quits by Young Workers*, 34 INDUS. & LAB. REL. REV. 563, 564-65 (1981) (finding differences in quits among workers and reviewing earlier research); Warren C. Whatley & Stan Sedo, *Quit Behavior as a Measure of Worker Opportunity: Black Workers in the Interwar Industrial North*, 88 AM. ECON. ASS'N. 363 (1998) (finding racial differences in quit behavior).

49. *See* Christopher L. Foote et al., *Discriminatory Labor Market: Black Workers at the Ford Motor Company, 1918-1947*, 21 J. LAB. ECON. 493 (2003) (finding that Black workers were less likely to quit foundry work, even without the additional compensation offered to white workers).

50. Richard Carey McGregory Jr., *An Analysis of Black-White Wage Differences in Nursing: Wage Gap or Wage Premium?*, 40 REV. BLACK POL. ECON. 31, 35 (2013) (finding that differences in union membership could explain the differences).

51. Blau & Kahn, *supra* note 48, at 572 (Black men (women) have 78% (86%) of quits of white men (women)); Whatley & Sedo, *supra* note 48, at 366 fig.1.

52. Naidu & Carr, *supra* note 31.

monopsony power to exploit women and people of color, with Black workers facing the most potential exploitation.[53]

So where do these racial differences in quit elasticity come from? The Sections below explore three potential sources of racial difference, all involving worker access to outside options. First, racial differences in the architecture and content of worker search networks limits workers of color in finding outside options, restricting their search ability relative to white workers. Second, workers of color may be less likely to locate or secure outside options because of racial discrimination, both intentional and subconscious. Third, racial segregation in access to human capital—to schooling and to experience in the labor market—also limits access of workers of color to outside options relative to white workers. The following discussion considers each in turn.

a. Racial Differences in Job Search Networks

For labor markets to be competitive, workers must be able to move to other jobs—outside options—that pay higher wages or have better working conditions.[54] Market structures and frictions that interfere with job mobility for workers of color make it more likely that they will remain in jobs where they are not being paid the marginal revenue product of their labor. This Section argues that racial discrimination—intentional, institutional, and structural—inhibits the move to outside options for workers of color and immigrant workers.

One such impediment has to do with racial differences in job search networks. Job referral networks, made up mostly of worker's personal and professional contacts, play a key role in mediating worker job search.[55] Job opportunities are often filled without any formal hiring process[56] and, even when such a process exists, the influence of social connections can still be strong, as network contacts steer candidates towards jobs and endorse them to those with hiring power.[57]

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53. *Id.*

54. Ashenfelter et al., *supra* note 23.

55. Mark S. Granovetter, *The Strength of Weak Ties*, 78 AM. J. SOCIO. 1360, 1360 (1973); James D. Montgomery, *Social Networks and Labor-Market Outcomes: Toward an Economic Analysis*, 81 AM. ECON. REV. 1408, 1408-10 (1991).

56. James R. Elliott, *Referral Hiring and Ethnically Homogenous Jobs: How Prevalent is the Connection and for Whom?*, 30 SOCIAL SCIENCE 401, 401 (2001) ("[M]any employment opportunities become detached from the open market, becoming rationed instead on the basis of insider referrals.").

57. Roberto M. Fernandez et al., *Social Capital at Work: Networks and Employment at a Phone Center*, 105 AM. J. SOCIO. 1288, 1291 (2000) (detailing mechanisms by which social networks direct and promote candidates to hiring decisionmakers).

But as the following discussion illuminates, key racial differences in search networks reduce the ability of workers of color to search for jobs as easily as whites. Race shapes several important structural features of these networks that will help to determine the network's effectiveness, like the racial identity of a candidate's network contacts, and in turn, the wages of jobs that those network contacts have connection to, as well as the willingness of contacts to endorse a candidate for the job.

Job search networks are racially segregated owing to homophily: people are more likely to be connected socially (and professionally) to others who share their racial identity.[58] Racial segregation of networks occurs even in the absence of racial animus but is exacerbated in the presence of negative attitudes towards people of color.[59]

The fact that job search networks are racially segregated has important implications for labor segregation. First, there are structural differences among racial job search networks that affect worker ability to locate or secure other jobs. Compared to white workers, immigrant, Black, and Latine job seekers have networks that are smaller in size and have fewer links per person to network contacts.[60] Relative to whites, the contacts that workers of color have are more likely to be unemployed or under employed.[61]

Race also affects the distance from contacts with hiring influence. In job referral networks, the job candidate must build a bridge of network contacts to the key influencers, for example, the recruiting coordinator. If there aren't enough ties to create the bridge from worker to decider, the referral network can fall apart, leaving workers cut off from job opportunities. Likewise, if the job candidate's network contacts are located too far from the decisionmaker, it becomes significantly less likely that the candidate can find a pathway through.[62]

Owing to historical discrimination, race shapes the network distance between a job seeker and a hiring influencer. New immigrants and workers of color are far more likely to reside in the layers of hierarchy at the bottom, far from direct access to employment, so they will have to work harder to use their network to contact decisionmakers.[63] In particu-

58. Miller McPherson, Lynn Smith-Lovin & James M. Cook, *Birds of a Feather: Homophily in Social Networks*, 27 ANN. REV. SOC. 415, 420-22 (2001).

59. *Id*. at 421.

60. *See* DARIA ROITHMAYR, REPRODUCING RACISM: HOW EVERYDAY CHOICES LOCK IN WHITE ADVANTAGE 89-92 (2014).

61. *See* David S. Pedulla & Devah Pager, *Race and Networks in the Job Search Process*, 84 AMER. SOC. REV. 983, 988 (2019) (Black workers are less well represented in formal employment, clustered in less desirable jobs and are more likely to be unemployed).

62. *Id*. at 988 (discussing placement).

63. Lisa Finneran & Morgan Kelly, *Social Networks and Inequality*, 53 J. URBAN ECON. 282, 292 (2003).

lar, workers of color will have to bridge far more ties to connect to well-placed contacts.[64] This is because workers of color are far less likely to have contacts in their networks who are well-connected or in positions of power.[65]

Race also shapes access to certain kinds of information. Individual nodes in the network vary in terms of how much access they have to information. White male-dominated networks provide access to more job-seeking information because white men have access to more information, controlling for individual and employment characteristics.[66] Race also shapes access to information because race can shape the architecture of the networks. For example, racial differences in the average number of ties contained in Black and white social networks can explain as much as 15 to 20% of unexplained gaps in wages.[67] These differences may affect immigrant workers as well: for example, ethnic differences in outside options associated with a worker's professional networks can account for as much as 88% of the wage gap between immigrants and non-immigrants in Germany.[68]

Second, some evidence suggests that the network contacts of color are also less likely to mobilize on behalf of a candidate. Network contacts are less likely to endorse the candidate, perhaps fearing that if the endorsed job candidate doesn't work out, the network contacts will lose political capital with the firm to whom they endorse. As a result, job candidates are less likely to obtain job leads or ultimately jobs from their social networks.[69] Even for those networks of color in which contacts are more likely to endorse candidates to each other, the structural differences in these "ethnic economy" networks end up restricting opportunity more than they expand it.[70]

Drawing on extensive and rich national data on jobseekers, Mark Pedulla and Devah Pager tested whether racial differences in network ac-

64. *Id*. at 292 (finding that a small difference in the number of contacts can make the difference between failing and success in contacting the decisionmaker).

65. Julie A. Kmec, *Ties That Bind? Race and Networks in Job Turnover*, 54 SOC. PROBS. 483, 487 (2007).

66. Steve McDonald, *What's in the "Old Boys" Network? Accessing Social Capital in Gendered and Racialized Networks*, 33 SOC. NETWORKS 317, 324-25 (2011).

67. Kenneth Arrow & Ron Borzekowski, *Limited Network Connections and the Distribution of Wages*, Social Science Research Network (Dec. 20, 2004), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=632321; *see also* Marc-David L. Seidel et al., *Friends in High Places: The Effects of Social Networks on Discrimination in Salary Negotiations*, 45 ADMIN. SCI. Q. 1 (2000).

68. Caldwell & Danieli, *supra* note 26, at 3.

69. McDonald, *supra* note 66, at 326; Pedulla & Pager, *supra* note 61, at 989, 1000.

70. *See* Yannis M. Ioannides & Linda Datcher Loury, *Job Information Networks, Neighborhood Effects, and Inequality*, 42 J. ECON. LITERATURE 1056, 1066 (2004).

cess and network returns were associated with differences in jobseeking success. Their study found that although workers of color used their networks as often as white workers did, the positive returns for network search for white workers was twice the size of the returns for Black workers.[71] This parallels other research by Pager, who found that Black jobseekers must apply to twice the number of jobs as white seekers to net the same number of interviews.[72]

b. Racial Discrimination

Beyond differences in the ability to search for other jobs, workers of color are also less able to move to other jobs in response to dropped wages because they face racial discrimination in the job search process. Following Gary Becker, economists define discrimination as a situation in which workers who are equally productive receive different rewards, like wages and benefits. Discrimination can also exist when workers of color are treated differently than white workers, in terms of working conditions, for example.[73]

A robust body of work confirms that for decades, racial discrimination has consistently shaped the ability of workers of color to find jobs and the wages they are offered when they find those jobs.[74] Sometimes, racial discrimination is subtle and hard to detect; applicants of color often don't get the benefit of the doubt in the job evaluation process.[75] Other times, racial discrimination in hiring is easily detectable in experimental data.

For example, a now-famous study by Bertrand and Mullainathan that sent out identical resumes with racially differentiated names found that white names received 50% more callbacks. More recent research has found the same response rate but lower salary offers for applicants with Black-identified names with an elite college degree and white applicants with a less selective college degree.[76] Likewise, studies comparing white

71. Pedulla & Pager, *supra* note 61, at 996-1003.

72. Devah Pager, Bruce Western & Bart Bonikowski, *Discrimination in a Low-Wage Labor Market: A Field Experiment*, 74 AM. SOCIO. REV. 777, 785 (2009).

73. ROBERT S. RYCROFT, THE ECONOMICS OF INEQUALITY, DISCRIMINATION, POVERTY, AND MOBILITY 178 (2017).

74. *See* Lincoln Quillian, Devah Pager, Ole Hexel & Arnfinn H. Midtbøen, *Meta-analysis of Field Experiments Shows No Change in Racial Discrimination in Hiring Over Time*, 114 PROC. NAT'L ACAD. SCI. 10870 (2017); Cordelia W. Reimers, *Labor Market Discrimination against Hispanic and Black Men*, 65 REV. ECON. & STAT. 570 (1983).

75. *See* Deborah B. McBrier & George Wilson, *Going Down? Race and Downward Occupational Mobility for Workers in the 1990s*, 31 WORK & OCCUPATIONS 283, 285 (2004).

76. S. Michael Gaddis, *Discrimination in the Credential Society: An Audit Study of Race and College Selectivity in the Labor Market*, 93 SOC. FORCES 1451, 1467, 1469 (2015).

"testers" (confederates sent in to observe employer responses) with Black and Latine testers with the same credentials find that white testers who have a criminal record for cocaine possession received positive responses at the same rates as applicants of color with no criminal records.[77]

In addition, occupational segregation also lowers wages for workers of color by affecting their distribution in occupations—the fact that workers of color are disproportionately employed in low-wage jobs, and blocked from outside options in higher-wage jobs, explains between 39 and 49% of racial wage gaps among white, Black, and Latine workers.[78] By some estimates, the impact of racial discrimination in the job search process is responsible for at least one third of the raw wage gap between whites and African-Americans.[79]

Importantly, employers are able to discriminate when the labor market is not competitive. Economist Gary Becker has famously argued that competition in the long run undercuts employers who discriminate: employers who decline to hire or disfavor hiring workers of color end up restricting their worker supply, and discriminating employers can then be outcompeted by employers who do not impose racial restrictions on their labor supply.[80] But Becker concedes that when the labor market is not competitive—for example, when the employer is one of a limited number of employers (monopsony)—then employers can discriminate against workers of color without threat of being outcompeted by employers who do not discriminate.[81]

Market frictions also create space for discrimination under Becker's analysis. If, for example, workers of color face job search difficulties locating those employers who do not discriminate, then non-discriminating employers would be less likely to outcompete those who do discriminate. Likewise, if employer discrimination is regionally clustered, and workers differentiate among jobs on the basis of commute time or geographic proximity to residence, discriminating employers (say, in the southern United States) face less competitive threat from non-discriminating employers (say, in the northern United States).[82]

When it comes to immigration status, both immigrants and undocumented workers are peculiarly exploitable given their lack of outside

77. Pager et al., *supra* note 72, at 785.

78. Kim Weeden, *Occupational Segregation*, PATHWAYS: STATE OF THE UNION 35 (2019); *see also* GARY BECKER, THE ECONOMICS OF DISCRIMINATION 4-5 (1971).

79. Roland Fryer, Devah Pager & Jörg L. Spenkuch, *Racial Disparities in Job Finding and Offered Wages*, 56 J. L. & ECON. 633 (2013).

80. Becker, *supra* note 78, at 21-22.

81. *Id*.

82. *See* Eric Posner, Glen Weyl & Suresh Naidu, *Antitrust Remedies for Labor Market Power*, 132 HARV. L. REV. 537, 538, 555 (2018) (discussing geographic constraints and employer power to exploit).

options. Undocumented workers can be identified on the basis of a particular trait—their immigration status—as having limited outside options for employment. Studies that estimate labor supply elasticities for undocumented vs. documented workers find evidence that undocumented workers are less likely to move jobs or reduce work in response to wage differences. This suggests that employers have the power to exploit undocumented workers.[83]

Likewise, immigrants exhibit lower labor supply elasticity than non-immigrant workers.[84] If workers of color and immigrant workers have lower mobility owing to racial discrimination, employers can maximize profits by paying their workers less than their marginal revenue product.[85]

More generally, the country's long history of structural discrimination has concentrated Black, Latine, and immigrant workers at the lower end of the wage scale. As a result, any widespread wage suppression from other sources—monopsony power owing to market concentration, limited job mobility because of outsourcing, undercutting of collective bargaining, the fissuring of the workplace to increase informal gig jobs, or restructuring of the economy away from manufacturing and non-college educated workers—inflicts disproportionate harm on workers of color.[86]

Beyond race, gender discrimination also affects employer power to exploit workers. Researchers have noted, for example, that women in heterosexual relationships are far less mobile than men because heterosexual couples are less likely to move for the woman's job than for the man's.[87] As a result, employers may be able to pay women less without risking their departure for higher-paying jobs.

More recent empirical research finds that in fact, women's disproportionate domestic obligations impose greater geographic restrictions on their job choices, and women must worry more than men about non-wage components of the job, such as commute time and proximity to the

83. *See* Julie L. Hotchkiss & Myriam Quispe-Agnoli, *Employer Monopsony Power in the Labor Market for Undocumented Workers* (Fed. Rsrv. Bank of Atlanta Working Paper no. 2009-14d, 2012), https://www.econstor.eu/bitstream/10419/70649/1/599536837.pdf; *see also* J. D. Brown, Julie L. Hotchkiss & Myriam Quispe-Agnoli, *Does Employing Undocumented Workers Give Firms a Competitive Advantage?*, 53 J. REG'L SCI. 158 (2013).

84. Boris Hirsch & Elke J. Jahn, *Is There Monopsonistic Discrimination against Immigrants?*, 68 ILR REV. 501, 590 (2015).

85. Naidu & Carr, *supra* note 31, at 140; *see also* Whatley & Sedo, *supra* note 48.

86. Lawrence Mishel & Josh Bivens, *Identifying the Policy Levers Generating Wage Suppression and Wage Inequality*, ECON. POL'Y INST. (2021), https://www.epi.org/unequalpower/publications/wage-suppression-inequality/.

87. *See* Thomas Le Barbanchon et al., *Gender Differences in Job Search: Trading Off Commute Against Wage*, 136 Q. J. ECON. 381 (2021); *see also* Robinson, *supra* note 36.

family home.[88] Data shows that women's relatively lower firm-level elasticity of labor supply—their lower willingness to exit in response to reduced wages—is associated with lower wages for women compared to men.[89]

c. Exploitation and Schooling, Experience and Training

Finally, workers of color are vulnerable to exploitation because persistent institutional discrimination segregates access to human capital by race and class. People of color and immigrants have less access to education and training, both of which can help job applicants to move to higher wage outside options.

Critics of research on monopsony power and the power to exploit often argue that racial wage gaps more likely reflect racial differences in human capital. They argue that workers of color and immigrant workers are occupationally segregated and earn lower wages than whites because they have relatively fewer skills and lower levels of education than do whites.[90]

Two points are worth making in response. First, racial wage and employment gaps often appear even among workers in the same occupation with the same levels of skill and education.[91] Back in 1979, Black men working full-time in the United States earned 83% of the wages of white men after controlling for occupation, education, experience, and location; Latines earned 83% of white wages, controlling for occupation, education, experience, and location.[92] In 2015, Black men's relative wag-

88. Boris Hirsch, Thorsten Schank & Claus Schnabel, *Differences in Labor Supply to Monopsonistic Firms and the Gender Pay Gap: An Empirical Analysis Using Linked Employer-Employee Data from Germany*, 28 J. LAB. ECON. 291, 293 (2010); Michael R. Ransom & Ronald L. Oaxaca, *New Market Power Models and Sex Differences in Pay*, 28 J. LAB. ECON. 267 (2010); *see also* Erling Barth & Harald Dale-Olsen, *Monopsonistic Discrimination, Worker Turnover, and the Gender Wage Gap*, 16 J. LAB. ECON. 589, 589 n.3 (2009).

89. Using census data on households and employers, one study found that women have lower labor supply elasticity across firms in the United States relative to men, in part because they face mobility restrictions associated with marriage and children that men do not face. The study concluded that these lower across-firm elasticities reduce women's earnings by 3.3%, all else equal. Douglas Webber, *Firm Level Monopsony and the Gender Pay Gap* (IZA Discussion Paper 7343, 2013).

90. *See, e.g.*, James J. Heckman, *Detecting Discrimination*, 12 J. ECON. PERSPS. 101,(1998); Abigail Thernstrom & Stephan Thernstrom, *The Real Story of Black Progress*, WALL ST. J., Sept. 3, 1997.

91. Elise Gould, *Black-White Wage Gaps are Worse Today than in 2000*, ECON. POL'Y INST. (Feb. 27, 2020, 5:34 PM), https://www.epi.org/blog/black-white-wage-gaps-are-worse-today-than-in-2000/.

92. Mark Stelzner & Kate Bahn, *Discrimination and Monopsony Power*, 49 REV. BLACK POL. ECON. 152, 152 (2021) (citing U.S. Census Bureau data).

es were 78% of white men, and Latine wages were 85.1%, even after controlling for education, experience, and location.[93] The racial wage gap is widest for women of color even though they attain significantly higher levels of education than do men of color.[94]

Second, racial differences in education, skills training, and experience can be traced to structural disparities in race and class. Persistent institutional disparities limit access to education and training for people of color. Specifically, racial segregation shapes access to education, which is stratified along race-class dimensions. Public schools are racially and economically segregated; research finds that districts with high concentrations of Latine and Black students are far more likely to be underfunded (by more than $5,000 per student on average) than majority-white districts.[95] In addition, returns to schooling are systematically lower for Black and Latine people (by as much as 23%) compared to whites.[96] Racial wage suppression also affects access to education, skills training, and job experience. When wages are suppressed on the basis of racial exploitation, workers are less able to afford schooling and job training.[97]

Beyond schooling, racial discrimination shapes access to experience. Because job seekers of color on the labor market experience racial discrimination, this discrimination also means that these workers get less experience. This limitation has compounding effects over the course of a worker's career, as experience helps a worker get the next job, which then translates into additional experience.[98]

Some scholars have argued that when wages are suppressed, people who are underpaid will rationally invest less in skills, education, and ex-

93. *Id.* Researchers controlled for education, experience, and location by examining wage gaps among research subjects who shared the same level of education and experience and were located in the same place.

94. Bruce Baker, *Closing America's Education Funding Gap*, THE CENTURY FOUND. (July 22, 2020), https://tcf.org/content/report/closing-americas-education-funding/.

95. *Id.*

96. Shervin Assari, *Understanding America: Unequal Economic Returns of Years of Schooling in Whites and Blacks*, 7 WORLD J. EDUC. RES. 78 (2020) (returns for African-Americans systematically less); *see also* Gabriela Sánchez-Soto, Andrea Bautista-León & Joachim Singelmann, *The Return-on-Education Gap Between Hispanics and Non-Hispanic Whites*, 24 PAPELES DE POBLACIÓN 245 (2018).

97. *See* U.S. DEP'T OF EDUC., NCES, THE CONDITION OF EDUCATION 2019 (2019), https://files.eric.ed.gov/fulltext/ED594978.pdf; *see also* Erica Blom & Tom Monarrez, *Understanding Equity Gaps in College Graduation* (Jan. 2020), https://www.urban.org/sites/default/files/publication/101638/understanding_equity_gaps_in_college_graduation_1.pdf (controlling for family income reduces many racial gaps on these human capital metrics, sometimes by more than half).

98. *See* Donald Tomaskovic-Devey et al., *Race and the Accumulation of Human Capital Across the Career: A Theoretical Model and Fixed Effects Application*, 111 AM. J. SOCIO. 58, 60 (2005).

perience.[99] Given the above analysis, the better argument might be framed as a claim about the link between racially suppressed wages and reduced institutional access for communities of color. Human capital is almost never solely an individual choice; far more often, it is shaped by individual, structural, and institutional discrimination.[100]

d. Neocolonial Differences Wages and Unemployment

This Section discusses the theory of racial exploitation in a global context. As before, the lack of outside options explains why employers can pay workers from the Global South far less than the marginal revenue product value of their labor. As is true for more established firms, start-ups diligently seek to cut costs by searching for global labor "arbitrage" opportunities: labor forces with relatively lower labor costs, meaning workers who will accept relatively lower wages in exchange for equal or higher levels of productivity.[101]

For artificial intelligence researchers and firms, online workers in many countries from the Global South offer arbitrage opportunities, particularly from those countries that were formerly colonized by Britain, in which workers speak English but can be paid a fraction of what workers in the U.S. would cost.[102] Others have written about the link between the drain of wealth from India to Britain during the colonial era and the persistent underdevelopment of the colony as a result of things like oppressive land taxes, diversion of resources to civil administration and the imperial army, and perhaps most importantly, the extractive export of commodities from India to Britain.[103]

Against the backdrop of that colonial history, modern day global labor arbitrage by the West relies on both underpayment of immigrant workers "on-shore" and the deployment of workers from the same countries "off-shore." Such arbitrage drives down wages on-shore and off-shore as well, by increasing the labor supply and adding workers will-

99. *See, e.g.*, Shelly J. Lundberg & Richard Startz, *Private Discrimination and Social Intervention in Competitive Labor Markets*, 73 AM. ECON. REV. 340 (1983); *see also* ERIC POSNER, HOW ANTITRUST FAILED WORKERS (2021).

100. *See* Tomaskovic-Devey et al., *supra* note 98.

101. *See* RAUL D. WISE & DAVID MARTIN, HANDBOOK OF THE INTERNATIONAL POLITICAL ECONOMY OF PRODUCTION 59 (2015).

102. MARY GRAY & SIDDHARTH SURI, GHOST WORK: HOW TO STOP SILICON VALLEY FROM BUILDING A NEW GLOBAL UNDERCLASS 160 (2019).

103. *See e.g.*, Pilar Nogues-Marco, *Measuring Colonial Extraction: The East India Company's Rule and the Drain of Wealth (1757-1858)*, (CEPR Discussion Paper No. DP15431 2020), https://ssrn.com/abstract=3737564; *see also* Amiya Kumar Bagchi, *Colonialism and the Nature of Capitalist Enterprise in India*, 23 ECON. & POL. WKLY. PE38 (1988) (focusing on the link between colonialism and persistent retardation of labor processes).

ing to accept low wages, owing to wage and unemployment differences among countries.[104]

The key question remains: why would digital microtask workers from the Global South accept wages that are a fraction of the wages paid in the Global North? Why wouldn't they quit and move to another job? The simple answer is that owing to persistent disparities, workers in countries like India have few outside options. The countries of the Global South in which these workers live are plagued with high levels of unemployment and very low wages. More importantly, immigration restrictions prevent mass migration of impoverished workers into Global North to take jobs in those countries.[105]

So, when an employer offers wages that are higher than other jobs in the region, workers have little choice. Again, we say that these wages are exploitative if they are less than the marginal revenue produce value of their labor—the value of the work in terms of the additional revenue that the worker's labor supplies to the employer, revenue that is usually generated in the employer's country. Employers are able to pay lower wages because workers in India have very few jobs at this wage level or higher to which workers could flee in response to exploitation.

Citing to those wage differences, some have argued that global labor arbitrageurs are not exploiting workers but are expanding employment opportunities. Moreover, they argue, the digital economy could in theory offer a way to reverse old colonial/imperial patterns of one-way flows of capital and technology from Global North to Global South. Rather than the old model, where profits flow from the periphery to the core, production is decentralized. Owing to the digital economy, entrepreneurs in countries like India that have invested in higher education and skills training are able to build long-distance partnerships and decentralized value chains of production that link India with the United States.[106]

All of this is true, as far as it goes. An employer can be simultaneously expanding employment opportunities for workers and still paying them below the marginal revenue product value of their labor. Indeed, the ability to exploit workers of color and workers in the Global South—to pay them below competitive market rates—is responsible for these expanded opportunities. Global labor arbitrage enables employers to reallocate the gains of production to themselves and to reduce the gains to la-

104. WISE & MARTIN, *supra* note 101, at 9.

105. *Id*.

106. *See* AnnaLee Saxenian, *The New Argonauts*, IMF 99, 99-100, 108-09 (2007), https://fileadmin.cs.lth.se/luarchive/www.oresund.org/entrepreneurship/content/download/69615/403130/file/Anna%20Lee%20Saxenian%20-%20The%20New%20Argonauts.pdf.

bor.[107] Later parts of the Paper will propose to redistribute these profits: innovators should offer deferred payment mechanisms so that at the very least, workers are paid the marginal revenue product of their labor once the innovation pays off.

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As this Section on exploitation shows, workers of color and immigrant workers have fewer outside opportunities owing to specific factors related to race and location in the Global South. Workers of color are victims of intentional and unconscious discrimination. Their job search networks are structurally less able to point them to outside options. Racially segregated education and labor markets limit their access to human capital. And global labor arbitrage that pays workers less on the basis of the relative wage rates of countries in the Global South exploits workers on the basis of their national origin and location.

Importantly, these factors flow from the material realities of race in the United States and the persistent effects of colonialism globally: workers of color and digital workers from communities of color at home and abroad in the Global South have far fewer outside options to which they can move when an employer pays them less than the marginal revenue product of their labor. The following Section investigates the operation of racial exploitation in three case studies in digital innovation.

III. CASE STUDIES IN EXPLOITATION

This Section explores three case studies of racial exploitation in digital innovation: Apple racially exploited immigrant women circuit board workers to make the Mac cheaper; its price was crucial to its commercial success. Uber and Lyft exploited drivers of color to drive full-time for part-time pay in order to grow explosively in the early stages of innovation; these firms also slashed wages in order to engage in a price war in a bid to capture the coveted winner-take-all position in digital markets. Artificial intelligence racially exploited "ghost workers" in India on MTurk to label data crucial to object recognition.

The case studies are snapshots taken from different moments—early, middle, and most recent—in the history of the digital economy. In each case study, innovators exploited workers of color in order to avail themselves of a cheap (underpaid), easy-to-scale-up, and easy to hire and fire reserve workforce. In all of these cases, workers of color had fewer out-

107. *See* WISE & MARTIN, *supra* note 101, at 2; *see* GRAY & SURI, *supra* note 102, at 160.

side options in the local or regional economy, owing to discrimination, restricted job search networks, and/or racially segregated access to schooling or training.

All of these innovations went viral and project founders would go on to over-the-top commercial success. But exploited workers of color who were key to success were never paid the full value of their essential labor, let alone allowed to share in the profits of success.

A. *Racial Exploitation to Support Computer Innovation in Silicon Valley*

In the mid-1980s, the invention of computer microchips revolutionized the electronics involved in computer design, triggering the explosive growth of the computer industry in Silicon Valley. As we will see, the racial exploitation of immigrant women played a key role in getting the newly-emerging computer industry off the ground. Namely, exploiting immigrant workers, many of them undocumented, enabled companies like Apple to manufacture personal computers at a price consumers could actually afford. As the following discussion illuminates, these women could be exploited largely because the agricultural work in the region had dried up, and because their immigration status restricted their job mobility.

Computer chips are made from silicon, the main component found in sand.[108] Chips are important to computers because they contain the transistors—crucial on-off switches that control the flow of electricity—that make up the nervous system and brain of the computer.[109] Technology has enabled engineers to squeeze billions of transistors onto the same tiny silicon microchip. These transistors can be switched on or off individually, to store the billions of ones and zeros that are the foundation of computer logic.[110]

Computer chips must be assembled on circuit boards to serve as the foundation for computer operations. In this stage, the microchips are assembled in packages and wired with very fine wire leads onto the circuit board, together with other electronic components. The main part of the circuit board in a computer is called the motherboard. Importantly for our story, many of the electronic components are wired or soldered onto the board by hand. This labor, which requires relatively little training, is at the center of our story of racial exploitation.

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108. Amanda Trudell, *From Sand to Silicon: The Making of a Chip*, INTEL CORP. (Feb. 28, 2012), https://community.intel.com/t5/Blogs/Intel/We-Are-Intel/From-Sand-to-Silicon-The-Making-of-a-Chip/post/1334092?wapkw=silicon%20sand.

109. *Id.*

110. *Id.*

1. Making a Cheaper Computer: The Mac

By the early 70s, computer manufacturers had realized that they could expand their market dramatically beyond the military-industrial computers by developing home computers for personal use, pitched to the mass consumer market.[111] In 1981, IBM introduced its PC, running an operating system developed by Bill Gates. The PC lacked a graphical user interface that allowed home users to easily operate the computer. Apple Computers surged ahead in the personal computer competition, introducing some of the earliest commercially available computers with a graphical user interface.[112]

The company introduced the Mac on January 24, 1984, heralding it as a revolutionary product that would change the way people interacted with their computers. The story of the Mac's launch followed the earlier standard narratives of genius innovators: two brilliant designers working into the wee hours of the morning to invent the next big thing.

But Steve Jobs and Steve Wozniak did not work alone. Though Jobs and Woz deserve credit as the primary builders of the Mac, contemporaneous documents show that the two founders also relied heavily on over 140 workers, mostly women (85-90%) and mostly immigrant (80%)[113] who helped to put together the Macintosh prototypes that would revolutionize the industry.[114]

These immigrant women workers showed up to work at the Fremont plant at 5:45AM, working through the day and far into the night assembling the nervous system of the MacIntosh.[115] The earliest version of the Mac used Motorola microchips, which immigrant workers wired in sequence onto the main circuit boards of the computers.[116] Immigrant women also provided the essential labor for later parts of the assembly line. Latina workers like Sara Trujillo inspected the circuit boards

111. Much of the narrative for the making of the Mac comes from the Fremont Flash, a newsletter circulated at Apple's Fremont plant, where the Mac was designed and launched. *See* LOUIS HYMAN, TEMP: THE REAL STORY OF WHAT HAPPENED TO YOUR SALARY, BENEFITS, AND JOB SECURITY (2018); Karen J. Hossfeld, Divisions of Labor, Divisions of Lives (1988) (Ph.D. dissertation, U.C. Santa Cruz) (on file with author).

112. HYMAN, *supra* note 111, at 262.

113. Hossfeld, *supra* note 111, at 46; *see also* Karen J. Hossfeld, *Hiring Immigrant Women*, *in* RACE AND ETHNIC CONFLICT: CONTENDING VIEWS ON PREJUDICE, DISCRIMINATION AND ETHNIC CONFLICT 162, 166 (1999).

114. HYMAN, *supra* note 111, at 237 (citing to reports from the Fremont Flash, the company newsletter published at the Fremont plant where the Mac was developed).

115. *Id*.

116. *Id*.

before they were put into the oven to remove moisture.[117] Asian women workers like Hung Troung put the computers into boxes.[118]

Immigrant workers would continue to play a key role in the evolution of the Mac in the mid-1980s and 90s. Though many circuit board jobs had gone overseas at that point, Apple still employed these workers for short-term projects linked to each new iteration of the Mac.[119] These workers weren't marginal players; roughly 40% of workers in Silicon Valley at the time were employed in production work.[120]

Cutting costs proved perhaps the feature of the Mac most central to its success. Apple had launched the "Lisa," the first commercially available home computer with a graphical interface, at a price point of $10,000 in 1983.[121] Retailers could not sell these personal computers at that price, and software developers (as a result) refused to write software for them as a result.[122] Apple set its sights on launching the Mac as a much lower-cost version of the Lisa.[123]

As a result, exploitation wasn't incidental to Apple's use of immigrant women and vendors who employed them; it was a key feature. To staff the Mac and its subsequent iterations, Apple turned to third-party vendors, who paid even less than Apple had paid in-house.[124] To keep costs as low as possible, Apple routinely pruned its vendor list, pushing its suppliers to cut costs even lower.[125] In turn, board shop owners operated on ever thinner margins, and low wages proved essential to remaining competitive. One shop owner explained that the low wages associated with an immigrant workforce were the factor most essential to cost competitiveness:

> If you take away the immigrant population – or whatever population is able to survive at the low end of the wage spectrum – then we're out of here. If we had to increase outlays for labor, there's no way we could remain afloat.[126]

Another owner made the same point: when the Immigration and Naturalization Service conducted immigration raids, it would reduce available labor and create uncertainty about the future of small shops. "If

117. *Id.*
118. *Id.*
119. Hossfeld, *supra* note 111, at 45.
120. *Id.* at 44.
121. HYMAN, *supra* note 111, at 235.
122. *Id.*
123. *Id.*
124. *Id.*
125. *Id.* at 240.
126. Hossfeld, *supra* note 111, at 98.

there's a labor shortage, that drives wages up, which means we close down."[127]

To keep pace with the uncertainty and volatility of production, the factories producing personal computers focused on giving the company the flexibility of "just-in-time production." This was a production strategy that involved keeping very little inventory on hand at the factory and boosting production "just in time" to match demand.[128] The pace of technological change dictated short production runs and product life cycles, as the Mac became easier for the home computer owner to use.[129]

To accomplish just-in-time production, Apple relied on three key strategies. First, the company moved much of its production line to places like Singapore, where the firm could more easily hire and fire workers and could pay workers a fraction of what they paid U.S. workers.[130] Second, Apple shifted from employees to in-house temps who could also be hired and fired at a moment's notice. By 1984, the Santa Clara area had 180 temp agencies and more temps than anywhere in the country.[131] Temps were the ideal flexible workforce—a group of workers that could be switched on or off as the need arose.[132] Third and finally, the company moved to third-party vendors for shorter-term prototype projects at the edge of innovation. Vendors paid even less than in-house jobs; they had to compete aggressively on cost.

Given the focus on costs, it comes as no surprise that Apple and its contractors relied almost exclusively on immigrant Asian and Latina women workers to supply the assembly labor. Immigrants and people of color comprised up to 75% of vendor production jobs, often more for smaller suppliers, where they were between 75 and 95% of the workforce.[133] As we will see, race, gender, and immigration status played an important role in structuring this all-important workforce.

2. Low Wages and Toxic Chemicals

In addition to low wages, exploitation enabled Apple and other innovators to offload the most dangerous work onto immigrant women. Asian and Latina workers on the production line worked with toxic chemicals like ethylene glycol, and they suffered reproductive injury from

127. *Id.*
128. HYMAN, supra note 111, at 234.
129. *Id.*
130. *Id.* at 235-38.
131. *Id.* at 240.
132. *Id.*
133. Hossfeld, *supra* note 111, at 166.

their exposure.[134] After complaints about spontaneous miscarriages multiplied, IBM organized a consortium of companies to study the issue.[135] All consortium studies confirmed that women who had been exposed to ethylene glycol suffered from disproportionately high rates of miscarriage.[136] One study in 1988 found that 38% of pregnant women suffered spontaneous miscarriages.[137] Although Valley companies undertook remedial efforts to limit exposure in the region, many of these fixes were ignored in overseas production facilities.[138]

It was not unusual for women to work at home. A San Jose Mercury News investigation in the 90s uncovered thirty electronic firm contractors who employed workers in their homes, paying them far below minimum wage.[139] These workers completed circuit boards in their kitchens or garages, enlisting their family members and underage children to assist in the work. Women often used their fingernails, which they grew strategically, as tools to manipulate the components onto the circuit board. The work often involved boiling the toxic chemicals on the stove in which to dip the circuit boards.[140]

3. Racial and Gendered Exploitation in Silicon Valley

In general, high-tech work in Silicon Valley in the mid-80s was then, as now, deeply segregated by race and gender. White men occupied the primary labor market for executives, engineers, and programmers. Asian and Latina immigrant women were at the bottom of the ladder in production jobs. About 25% of this workforce was undocumented.[141]

Apple and its vendors did not just take advantage of available cheap labor; they targeted immigrant women as cheap, expendable, and manageable. Managers described their women workers as more nimble-fingered, possessing better hand-eye coordination, more willing to do repetitive and mundane tasks, and able to sit or stand in one place for longer periods of time. Ethnographic studies of the emerging computer in-

134. LORA JO FOO, ASIAN AMERICAN WOMEN: ISSUES, CONCERNS, AND RESPONSIVE HUMAN AND CIVIL RIGHTS ADVOCACY 81-82 (2002).

135. *Id*. at 83.

136. *Id*.

137. *Id*. at 84.

138. Cam Simpson, *American Chipmakers Had a Toxic Problem. Then They Outsourced It*, BLOOMBERG (June 15, 2017), https://www.bloomberg.com/news/features/2017-06-15/american-chipmakers-had-a-toxic-problem-so-they-outsourced-it.

139. FOO, *supra* note 134, at 50.

140. HYMAN, *supra* note 111, at 241.

141. Hossfeld, *supra* note 113, at 165 (citing California Department of Development Report 1983).

dustry in Silicon Valley in the mid-80s reveal that employers relied on stereotypic traits (like the compliance of immigrant women and the unlikelihood of organizing) to steer the recruiting of their workforce.[142]

In a scholarly survey of electronics firm managers at the time, 75% of managers reported that immigrant women were better at assembly work than immigrant men.[143] A white male manager who supervised hiring at a Silicon Valley printed circuit board assembly shop described his hiring strategy explicitly in racial and gendered terms:

> I have a very simple formula for hiring. You hire right, and managing takes care of itself. Just three things I look for in hiring [entry-level, high-tech manufacturing production operatives]: small, foreign and female. You find those three things and you're pretty much automatically guaranteed the right kind of work force. These little foreign gals are grateful to be hired – very, very grateful – no matter what.[144]

Workers had few outside options other than working for local microelectronics firms or their vendors. In an ethnographic study of workers at the time, almost all of the immigrant women workers reported that they had very limited job and survival options outside their jobs in the electronics industry.[145] As the area's auto industry closed its plants in the mid-80s and agricultural work became more scarce, the Santa Clara area quickly became a "single industry boomtown," with the vast majority of low-wage workers working directly for the industry or in the service industry to support the electronics complex.[146]

Though workers had little choice among employers, employers had their pick of workers. As the demand for unskilled workers swelled, so too did the number of Mexican and Filipino workers who had been displaced from agricultural work in central and northern California, pushed out by machines that planted, tended, and harvested crops.[147] Undocumented workers had particularly few options other than agriculture, and even workers with green cards feared potential deportation if they complained about working conditions or wages.[148]

In sum, to manufacture commercially successful computers like the Mac, Apple and other high-tech firms relied heavily on immigrant wom-

142. *Id*. at 165-70.

143. *Id*. at 167.

144. *Id*. at 162.

145. Hossfeld, *supra* note 111, at 47.

146. ANNALEE SAXENIAN, REGIONAL ADVANTAGE: CULTURE AND COMPETITION IN SILICON VALLEY AND ROUTE 128 25 (1994).

147. *Id*. at 75.

148. Hossfeld, *supra* note 111, at 47.

en and undocumented workers to supply a low-cost workforce to which they could delegate the industry's dirty work. These workers had few other outside options in the area or even in the region. And though computers would earn Apple and its high-level executives billions of dollars, the workers who made their commercial success possible wouldn't even be paid the marginal revenue product value of their labor.

B. *Ridehailing and Racial Exploitation*

Ridehailing combines an old idea—getting a ride from someone else, and not someone necessarily licensed as a taxicab driver—with new technology. At the time ridehailing emerged, digital platforms like Amazon, eBay, and Airbnb had already been matching buyers and sellers of books, used items, and rooms to share. Ridehailing uses the same platform matching technology to connect people to car rides. Riders can summon a car on the phone, monitor the car as it makes its way, and coordinate the payment in a seamless transaction that avoids the delay of credit card or cash exchange.[149]

Like computer microprocessors, the story of ridehailing is traditionally told as the story of genius founders hitting on a singular idea and battling significant odds to bring the idea to fruition. But this narrative leaves out the contributions of the drivers who are at the very core of the business model. For ridehail firms, exploiting drivers of color would emerge as a key strategy at the very beginning of the innovation.

1. The Story of Uber

Uber launched in 2010 as a digital platform version of a black-car service, using licensed limousine drivers to pick up passengers willing to pay a premium for nice cars and reliable service.

Transportation network companies (TNCs) began to use unlicensed drivers in 2013, when two Uber competitors, Sidecar and Lyft, evaded regulator insistence that drivers be licensed. Eventually, Lyft negotiated a consent decree with the California Public Utilities Commission that let TNCs use unlicensed drivers but agreed to regulation for passenger safety. In the wake of the consent decree, Uber used unlicensed drivers to grow its labor force at lightning speed, adding 30,000 civilian drivers in just under a year, and 146,000 drivers over the next four years, in part by tapping into immigrant drivers who lacked four-year college degrees.[150]

149. ALEX ROSENBLAT, UBERLAND: HOW ALGORITHMS ARE REWRITING THE RULES OF WORK 21-25 (2018).

150. *See* PARROT & REICH, *supra* note 4, at 4.

Uber focused on making it easy for this group to sign up. Many of these would-be drivers had neither a car nor the credit credentials to buy or lease a new car. So Uber instituted a subprime leasing program, Uber Xchange, that enabled recruits to lease new vehicles from GM, Toyota, and Ford. Dealerships hired Spanish-speaking Uber and Lyft specialists to help recruits navigate the leasing process. Uber advertised the program on BET and other Black media outlets.[151]

Such help wasn't free, of course; the company diverted a percentage of the driver's earnings to pay off the loan.[152] In addition, Uber charged a premium for its riskiest drivers and repossessed cars when drivers were unable to make their payments.[153] In a repeat of the subprime mortgage debacle, many drivers of color were given subprime loan terms, illegal interest rates (some over 20%), and disproportionately had cars repossessed.[154]

As part of the race for market share, in June of 2013, Uber began a price war with Lyft, openly announcing its intention to do battle.[155] To gain a competitive advantage against Lyft, Uber first focused on speed, scale, and being first to market.[156] But by 2014, the price war required Uber to dramatically cut driver wages. In 2014, Uber dropped base fares by 30%, and again in 2015, by as much as 40% in Detroit and forty-seven other major metro areas. In 2016, fares dropped again by an average of

151. Leena Rao, *Uber now offers its own car leases to UberX drivers*, FORTUNE (July 29, 2015, 11:50PM), http://fortune.com/2015/07/29/uber-car-leases/.

152. *Id*.

153. Eric Newcomer & Olivia Zaleski, *Inside Uber's Auto-Lease Machine, Where Almost Anyone Can Get a Car,* BLOOMBERG (May 31, 2016, 11:00AM), http://www.bloomberg.com/news/articles/2016-05-31/inside-uber-s-auto-lease-machine-where-almost-anyone-can-get-a-car.

154. *Uber Agrees to Pay $20 Million to Settle FTC Charges That It Recruited Prospective Drivers with Exaggerated Earnings Claims*, FED. TRADE COMM'N (Jan. 19, 2017), https://www.ftc.gov/news-events/press-releases/2017/01/uber-agrees-pay-20-million-settle-ftc-charges-it-recruited; Deirdre Fernandes, *Santander Auto-Loan Unit to Pay Back $5.4m*, BOSTON GLOBE (Nov. 5, 2015 5:32PM), https://www.bostonglobe.com/business/2015/11/05/santander-agrees-million-settlement-over-high-auto-loan-rates/Nc1pZuFeh8WR18RpnLJjuI/story.html; *The Uber Workplace in D.C.*, GEO. UNIV. KALMANOVITZ INITIATIVE FOR LAB. AND THE WORKING POOR 9 (2019), https://lwp.georgetown.edu/wp-content/uploads/sites/319/uploads/Uber-Workplace.pdf.

155. BRAD STONE, THE UPSTARTS: HOW UBER, AIRBNB, AND THE KILLER COMPANIES OF THE NEW SILICON VALLEY ARE CHANGING THE WORLD 205 (2017) ("In the face of this challenge, Uber could have chosen to do nothing. We could have chosen to use regulation to thwart our competitors. Instead, we chose the path that reflects our company's core: we chose to compete.").

156. ADAM LASHINSKY, WILD RIDE: INSIDE UBER'S QUEST FOR WORLD DOMINATION 118 (2017).

15% in 100 cities. Neither surge pricing nor small reversals in cuts restored driver wages to their earlier levels.

To sell these fare reductions, Uber told drivers that lower fares would stimulate demand and drivers could offset the price differences with increased number of rides they would serve per hour.[157] But Uber knew this claim wasn't true. In internal communications, firm leaders acknowledged that in fact, many drivers would lose money, and that drivers would have to drive as much as 25% more trips to make up for the lost earnings from fare cuts.[158] The firm also acknowledged that its own projections "did not widely support" an increase in demand big enough to offset wage cuts.[159]

The price war with Lyft coincided with a period of unequaled growth for Uber. Despite price cuts, drivers kept signing up, kept turning on the app, and kept working, now having to increase their pace to offset the impact of the cuts.[160] The firm raised billions in venture capital in the next two and a half years, reaching over $17 billion by 2016.[161] The company used the money to dramatically expand its reach and size, hoovering up drivers and passengers to grow, clocking growth at a rate of 20% per month.[162] Ride volume doubled in some major metro areas in the space of just a year.

2. Drivers of Color at the Center of the Business Model

As recently as 2018, the vast majority of full-time ridehail drivers are workers of color and/or immigrant workers.[163] In Seattle, 70% of the full-time drivers who supply more than half of rider volume[164] are immi-

157. Neil Irwin, *Uber's Travis Kalanick Explains His Pricing Experiment*, N.Y. TIMES (July 12, 2014), https://www.nytimes.com/2014/07/12/upshot/ubers-travis-kalanick-explains-his-pricing-experiment.html; Rachel, *Beating the Winter Slump: Price Cuts for Riders and Guaranteed Earnings for Drivers*, UBER NEWSROOM (Jan. 9, 2016), https://www.uber.com/newsroom/beating-the-winter-slump-price-cuts-for-riders-and-guaranteed-earnings-for-drivers/.

158. Carolyn O'Donovan & Jeremy Singer-Vine, *Here's what Uber doesn't say about price cuts*, BUZZFEED NEWS (June 24, 2016) (reporting the leaking of internal memos and pricing spreadsheets to BuzzFeed).

159. *Id*.

160. Hall & Krueger, *supra* note 4, at 717-22.

161. LASHINSKY, *supra* note 156, at 151.

162. Stone, *supra* note 155, at 248.

163. A 2015 study by Krueger and Hall using proprietary data from Uber found that 60% of all drivers are some race other than white. *See* Krueger & Hall, *supra* note 4, at 710. *See also* TIME Magazine et. al, *supra* note 3 (motivated workers, defined as reporting 40% or more of their income from platform work, were 68% racial minorities, and casual workers were 49% minority).

164. PARROT & REICH, *supra* note 4, at 32.

grant workers or workers of color. Half of all ridehail drivers are Black, even though the city population is only 5% Black. Compared to other occupations in the area, drivers are three times as likely to be immigrants.[165]

Likewise, in San Francisco, 70% of the full-time group is minority, and 65% immigrant, with Latine and Asian drivers making up the biggest proportion.[166] In New York City, where 42% of drivers supply the majority of rides, the city's full-time (and part-time) work force is almost all immigrant—a whopping 86% of full-time drivers are immigrants, even though immigrants make up only 46% of the New York workforce for all other occupations overall.[167]

Relying on immigrant drivers and drivers of color has been part of the ridehail business model from the beginning. From mid-2012, (just before Uber began using unlicensed drivers) to the end of 2015, Uber grew to field 460,000 active drivers per month.[168] Research shows that Uber depended on immigrant drivers and drivers of color to fuel this growth.[169] In major metropolitan areas like Seattle and New York, Uber has depended heavily on immigrant drivers to staff their driver rosters.[170]

The ridehail industry transformed an evolving industry, in ways that further disadvantaged drivers. The taxicab industry had already reorganized earlier, moving drivers from employees to franchisees, and placing costs like insurance and benefits onto workers; the industry transformed at the same time from predominantly white to predominantly

165. A survey of Seattle drivers reveals that a third of all drivers have supplied more than half the ride volume. These drivers worked more than 32 hours a week and provided 55% of the completed rides. *See id*. at 23, 32.

166. Benner, *supra* note 4, at 8, 14.

167. James Parrot & Michael Reich, *An Earnings Standard for New York City's App-based Drivers: Economic Analysis and Policy Assessment*, THE NEW SCH. CENTER FOR N.Y. CITY AFFS. 15-16 (2018), https://static1.squarespace.com/static/53ee4f0be4b015b9c3690d84/t/5b3a3a946d2a73a677f855b9/1530542742060/Parrott-Reich+NYC+App+Drivers+TLC+Jul+2018jul1.pdf (report for the New York City Taxi and Limousine Commission).

168. Hall & Krueger, *supra* note 4, at 710 tbl.1.

169. In 1970, only 8% of taxi and limo drivers were immigrant drivers. By 2000, 38% of drivers were immigrants, and in 2014, the number rose to 42%. Susan Eckstein & Giovanni Peri, *Immigrant Niches and Immigrant Networks in the US Labor Market*, 4(1) RUSSELL SAGE FOUND. J. SOC. SCI. 1, 4 (2015); BRUCE SCHALLER, THE CHANGING FACE OF TAXI AND LIMOUSINE DRIVERS (2004), http://www.schallerconsult.com/taxi/taxidriver report.htm. In 2000, immigrant drivers made up more than 80% of some of the country's major metropolitan area driver workforces, and Black and Asian drivers together made up close to 55% in Chicago and New York. *Id*. at 19-22.

170. PARROT & REICH, *supra* note 4, at 23 (50% of Seattle Uber drivers are Black and are three times more likely to be immigrant compared to King County workers in general); Parrot & Reich, *supra* note 167, at 16 (NYC drivers are twice as likely to be immigrant as city workforce).

workers of color.[171] Similarly, ridehail firms displaced costs onto "independent contractors" and continued to disproportionately rely on drivers of color and immigrant drivers.

Importantly, there is no evidence that ridehail firms purposely targeted workers of color to exploit them. To be sure, Uber did start out focusing on immigrant-owned fleets and their predominantly North African and Muslim driver workforces, for purposes of identifying young and hungry operations and workers. The firm paid these core, original drivers to refer friends, and these informal networks of drivers of color and their friends disproportionately funneled more workers of color to the firm.[172] This kind of targeting had the effect of attracting immigrant drivers and drivers of color, even if the intent was to cut costs.

More importantly, even outside referral networks, drivers of color and immigrant drivers were disproportionately willing to drive for ridehail firms, even though these firms offered subminimum wages. This Paper argues that they did so because they had fewer outside options and were therefore willing to accept subminimum wages and positions for which they had to pay insurance, overtime, car maintenance, and health care benefits out of their own pockets.[173]

Second, Uber relied on drivers of color to retain its workforce even as the firm slashed its fares as much as 40% at one time (and more than 50% over a period of four years) during its price-war with Lyft. Data from the relevant periods shows that despite a short lull in recruiting after each fare reduction, drivers kept signing up, particularly full-time drivers, who were disproportionately drivers of color and immigrant drivers.[174] Finally, Uber needed a large group of casual drivers to keep down waiting times, even when the company risked fielding too many cars on the road to be efficient.[175]

Notwithstanding the key roles that Uber drivers of color played for the firm, the vast majority of them currently earn dramatically less than

171. Veena Dubal, *A Brief History of the Gig*, LOGIC MAG. 10 (May 4, 2020), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3649694; *see also* Eckstein & Peri, *supra* note 169, at 14.

172. In 2013, Uber offered payments of $700 for driver referrals, as long as the new driver completed a certain number of trips (typically forty). H.C. Robinson, Making a Digital Working Class: Uber Drivers in Boston, *2016-17* 27 (2017) (Ph.D. dissertation, Massachusetts Institute of Technology) (https://dspace.mit.edu/handle/1721.1/113946).

173. *See* Naidu & Carr, *supra* note 31, at 133 (arguing that firms need not engage in anticompetitive practices to have monopsony power over workers who have few outside options).

174. Jonathan V. Hall, John J. Horton & Daniel T. Knoepfle, *Pricing in Designed Markets: The Case of Ridesharing* 10 (Jan. 29, 2021), http://www.john-joseph-horton.com/papers/uber price.data.

175. Noah Zatz, *Is Uber Wagging the Dog With Its Moonlighting Drivers?* ON LAB. (Feb. 1, 2016), https://onlabor.org/is-uber-wagging-the-dog-with-its-moonlighting-drivers/.

the minimum wage in the city ($16.39 per hour in Seattle, and $15 in NY) once expenses are taken into account. Fig. 1 plots driver earnings in Seattle adjusted for expenses (ridehail fees, vehicle and licensing expenses, insurance, taxes). Only drivers in the 90th percentile earn above the minimum wage; and in the 10th percentile, they earned $10 an hour or less.[176]

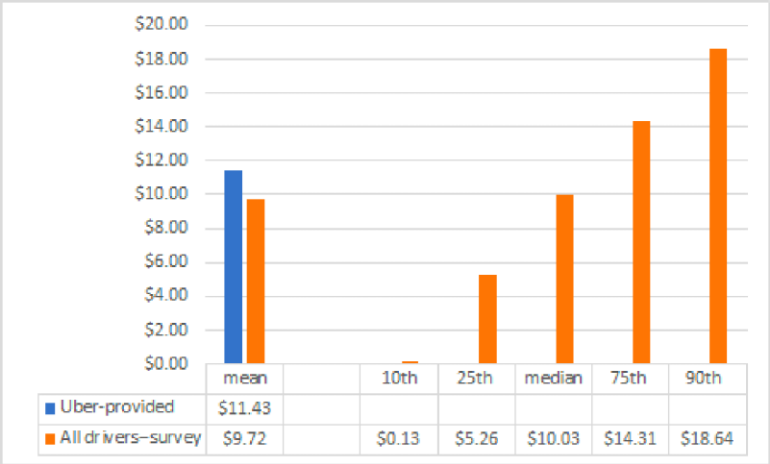

Fig. 1 After-expense TNC driver hourly earnings.[177]

Fig. 2 shows after-expense hourly earnings for New York, as of 2018. Median wages for Uber and Lyft are less than the minimum wage, and only workers at the 75th percentile for both companies exceed the minimum wage.

	Imputed hours				Net hourly earnings			
company	median	mean	total	share of total	25th percentile	median	mean	75th percentile
Juno	7.9	10.2	169,596	8.5%	$14.05	$15.68	$18.26	$18.77
Lyft	10.6	15.3	415,345	20.9%	$12.48	$13.85	$15.16	$15.62
Uber	21.5	23.8	1,320,961	66.4%	$13.31	$14.17	$16.03	$15.58
Via	15.6	23.8	84,737	4.3%	$17.70	$20.99	$21.73	$24.38
Combined	31.9	32.5	1,990,639	100.0%	$13.31	$14.25	$15.88	$15.77

Source: Authors' analysis of the universe of driver earnings for the week of October 15, 2017.

Fig. 2. Weekly Hours and Net Hourly Earnings by Company[178]

For San Francisco drivers as of 2018, before expenses, ridehailing drivers earned $900 a week, but after adjustments for expenses, earnings could drop as low as $360 a week. Researchers estimate that as many as

176. PARROT & REICH, *supra* note 4, at 55.
177. PARROT & REICH, *supra* note 4, at 55.
178. *Id.* at 29.

20% of drivers in San Francisco actually earn nothing once they factor in all expenses.[179]

Like the immigrant women who soldered circuit boards for Apple, the workers of color who drive for ridehailing companies had significantly limited options. As a general matter, digital ridesharing emerged at around the same time as the Great Recession of 2008. American workers suffered the effects of restructuring and outsourcing. Corporations had accelerated the pace of outsourcing, slashing American workforces by 2.9 million but boosting employment abroad by 2.4 million from 2000 to 2010.[180] Workers had far fewer outside options than they had had only a few years before.

If opportunities were restricted for working class and low-income workers in general, options were particularly restricted for workers of color and immigrant workers. Parrot and Reich investigated the state of the labor market in Seattle for immigrant workers without a four-year degree, the subpopulation on which ridehails relied heavily to launch in Seattle.[181] They found that less educated men of color and immigrant men were associated with significantly restricted opportunities and lower pay.[182]

> The five-year 2013-17 [American Community Survey] counted 91,000 immigrant males with less than a four-year college degree in King County. Only 10 percent of this cohort had a professional or managerial job; 50 percent of all workers in this group were in occupations with median annual earnings of $30,000 or less, and another 35 percent had median earnings between $30,000 and $40,000. Among this cohort, transportation occupations had median earnings of $26,900 and were the second-largest source of jobs, after construction. Even immigrant males with a four-year college degree or better had extremely low wages in transportation occupations – their median earnings were $27,000 versus $100,000 overall. Thus, many immigrant men likely were drawn into driving for TNCs by the promise of better pay than in alternative prospects in food services, building services, retail sales, and construction.[183]

179. Benner, *supra* note 4, at 28.

180. David Wessel, *Big U.S. Firms Shift Hiring Abroad: Work Forces Shrink at Home, Sharpening Debate on Economic Impact of Globalization*, WALL ST. J. (Apr. 19, 2011), http://www.wsj.com/articles/SB10001424052748704821704576270783611823972.

181. PARROT & REICH, *supra* note 4, at 25.

182. *Id*.

183. *Id*.

At present, drivers of color continue to dominate Uber's driver roster. According to Uber's own reports, at the beginning of 2015, people of color made up 60% of Uber drivers and a greater fraction of full-time drivers. 24% of all Uber drivers in 2015 were Black, 13% Asian, and 20% were Latine.[184] As wages drop each year, drivers like Jugal Hinwar feel compelled to drive even more to make up the fare cut deficits. "I have to work 16 hours a day to make enough money to support my family," reports Hinwar, who has been driving for Uber for two years. "Last week, I worked 19 hours in one day, and I slept in the car at JFK."[185]

C. *The Self-Driving Car: Exploiting Ghost Workers to Label Data for AI*

Princeton Professor Fei-Fei Li teaches computers to see. More specifically, she trains computer algorithms to recognize and name everyday objects in the world, from cats to casserole pans. Li has developed a massive data collection of images that she has drawn from the Internet, a dataset she calls ImageNet. These labeled images are the data on which computers are trained to recognize objects.[186]

In object-recognition, the computer is fed thousands of images, for example, of a cat. The computer uses these images to develop, by trial and error, a set of algorithmic rules or decision-tree models that enables the computer to recognize cats. The computer "learns," much as a child learns through her early years of exposure to both images and the labels that adults attach to the images. Does it have whiskers? Triangle ears? Fur? With what probability will it have a long tail? After the computer develops a set of rules, it applies them to new unlabeled images to predict whether the image is a cat.

As she developed ImageNet, Li found that labeling the images was no easy task. She needed human beings to identify and annotate the images from the internet, classifying them properly as cats for example. As Li moved to scale up the size of her dataset, she ran into a serious "web-scale" problem—she didn't have enough labelers.[187]

Li first tried student workers at Princeton, whom she paid $10 an hour. But the data annotation went too slowly; according to her projec-

184. These numbers could well be an underestimate; Uber did not release the underlying data for public distribution. *See* UBER REPORT, BENENSON STRATEGY GRP. (2015), https://ubernewsroomapi.10upcdn.com/wp-content/uploads/2015/01/BSG_Uber_Report.pdf.

185. Danielle Furfaro & Georgett Roberts, *Uber drivers working up to 19 hours a day just to get by*, N.Y. POST (Feb. 7, 2016), https://nypost.com/2016/02/07/uber-drivers-working-up-to-19-hours-a-day-just-to-get-by/.

186. Dave Gershgorn, *The Data that Transformed AI Research—and Possibly the World*, QUARTZ (July 17, 2017), https://qz.com/1034972/the-data-that-changed-the-direction-of-ai-research-and-possibly-the-world/.

187. *Id.*; *see also* Gray & Suri, *supra* note 102.

tions, given the limited number of student workers and their wage requirements, the Lab would have taken ninety years and millions of dollars to complete the project.[188]

In 2007, Li found the perfect solution. In a random conversation with a graduate student, she discovered tens of thousands of electronic pieceworkers available for hire on MTurk, which assigns digital piecework, often for one penny per task.[189] Li consulted a paper by Sorokin and Forsyth, who enthusiastically reported that paying workers on MTurk $1USD an hour produced high quality annotations at a rate of 300 an hour, though the work was perceived to be "fairly" priced at $3 USD.[190] Li was particularly struck by the fact that the userbase on AMT was global, making it suitable for large scale data annotation.[191]

Thanks to AMT, Li now had at her disposal tens of thousands of workers to work in parallel on the project for a few cents per label. Sometimes multiple workers worked on the same task, improving the quality of the labels. As the project went on, and she had more workers available, she began to use them to grade the quality of each other's work in order to identify "oracles," so-called expert data annotators or labelers. Towards the end, when she still needed more workers but was running out of money, she tried to attract workers by creating crowdsource games that pitted workers against each other to "compete."[192]

ImageNet transformed the industry almost immediately. Firms held competitions among algorithms using ImageNet, and the winner, an algorithm called a convolutional neural network (CNN), launched a period of explosive growth for the artificial intelligence industry. The CNN now makes fewer recognition errors even than human eyes and offers staggering possibility in new smart technology: doctors will have extra pairs of eyes to diagnose patients, cars will drive themselves on the road, and multiple drone robots will search for survivors after a natural disaster.[193]

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188. Gershgorn, *supra* note 186; GRAY & SURI, *supra* note 102, at 16.

189. GRAY & SURI, *supra* note 102, at 16; *see also* Jia Deng, Wei Dong, Richard Socher, Li-Jia Li, Kai Li & Li Fei-Fei, *ImageNet: A Large Scale, Hierarchical Image Database,* 2009 IEEE CONFERENCE ON COMPUTER VISION AND PATTERN RECOGNITION 4 (2009).

190. Deng et al., *supra* note 189, at 4 (citing to A. Sorokin and D. Forsyth, Utility data annotation with Amazon Mechanical Turk, InterNet08, pages 1–8, 2008).

191. *Id.*; *see also* Alexander Sorokin & David Forsyth, *Utility Annotation with Amazon Mechanical Turk*, 2008 IEEE CONFERENCE ON COMPUTER VISION AND PATTERN RECOGNITION WORKSHOPS (2008), https://vision.cs.uiuc.edu/annotation/papers/cvpr08_annotation.pdf.

192. Fei-Fei Li, *How We're Teaching Computers to Understand Pictures*, TED (Mar. 17, 2015), (https://www.ted.com/talks/fei_fei_li_how_we_re_teaching_computers_to_understand_pictures).

193. Gershgorn, *supra* note 186.

ImageNet was part of a new paradigm of economic growth that focused on information as the coin of the realm. In the launch phase of this new paradigm, ghost workers were crucial to the industry's success. Mary Gray and Siddharthi Suri write, "If customer data is the new oil, the people doing ghost work operate the rigs."[194] Both speed and scale were key to getting ImageNet off the ground. Thanks to the ghost workers on MTurk, ImageNet was able to create a dataset of five million images far more quickly than in ninety years—Li finished in an astonishing two and a half years and right on budget.[195]

Scholars call the workers who annotate data "ghost workers" to reflect that almost always they are nameless and faceless, working invisibly behind the scenes. So who were the workers on MTurk responsible for building ImageNet? Research suggests that a small core group of workers completed most of the ImageNet tasks: although the real number of active MTurkers was between 15,000 and 43,000, 80% of the tasks were carried out by the 20% most active (3000–9000) workers.[196]

Slightly more than half of these essential workers came from the Global South. A 2010 study showed that Indian workers made up the largest group—roughly 50%—of core "MTurkers," followed by workers from the United States and other former British colonies like Egypt.[197] As discussed more at length below, this high percentage could be explained by three key facts. First, as former colonies of Britain, India and Egypt's workers spoke English at a sufficiently high level to take MTurk tasks (MTurk is only in English). Second, India was the only other country aside from the United States that allowed workers to be paid in local currency via direct deposit or a paycheck (for a fee) rather than with gift cards.[198]

Third, and perhaps most importantly, Indian workers were willing to complete these tasks for a few cents per task. Their willingness to take such low wages reflected a lack of meaningful alternative work for much of India's college-educated population. During the time Li recruited MTurkers to complete ImageNet, around 2007, India's unemployment was high—between 7 and 8% for rural and urban areas, respectively.[199]

194. Gray & Suri, *supra* note 102, at 16.

195. Fei-Fei Li, *supra* note 192.

196. Joel Ross et al., *Who are the Crowdworkers? Shifting Demographics in Mechanical Turk*, CHI '10 EXTENDED ABSTRACTS ON HUM. FACTORS IN COMPUTING SYS. (Apr. 10, 2010), https://dl.acm.org/doi/10.1145/1753846.1753873.

197. Panagiotis Ipeirotis, *Demographics of Mechanical Turk* (N.Y.U. Working Paper No. CEDER-10-01, 2010), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1585030 (includes excel spreadsheet topline results of survey).

198. Ross et al., *supra* note 196.

199. U.N. Dep't of Econ. & Soc. Affairs & ILO, Labor Market Performance and the Challenge of Creating Employment in India, 3, 6 (June 24, 2011).

Only 39% of the population was employed in salaried/waged jobs in 2007, and very few in managerial jobs or professional jobs.

Although India's growth rate was quite robust during this period, economists called India's growth "jobless" because it did not translate to employment. This was particularly true for the country's "scheduled castes" and "scheduled tribes," who experienced unemployment rates of 10% and, for scheduled castes in rural areas, unemployment rates as high as 12%. Poverty rates were at 28%, suggesting that a large fraction of the population was earning below minimum wage.[200]

Most remarkably, India's unemployment rates are higher for the most educated. "Educated unemployment" rates—the rates for people who have graduated from institutions of higher learning—were (and remain) among the highest in the country.[201] Economic development has not generated jobs that can make use of a university education.[202]

In the absence of skilled work for India's college graduates, many turn to gig work in the United States in order to survive economically. As a survey conducted at the time revealed, more workers used MTurk as a primary source of income than in other countries, and they worked for economic reasons rather than for enjoyment or casual pay. For Indian MTurkers, close to 60% of them earned less than $10,000 a year. Wage rates for these workers were far lower than for U.S. MTurkers.[203] Wage rates for Indian workers in 2019 were half of what U.S. workers were paid ($1.41 per hour in India vs. $3.01 per hour in the United States).[204] Actual take-home earnings were likely lower—workers on MTurk did not get paid for additional work associated with the actual HIT tasks performed, namely the time spent checking to make sure that they've been paid.[205] Importantly, wage rate distributions in 2010 showed that the virtual market operated as a coherent market: while India's rates were at the

200. *Id*. at 3, 6.

201. Craig Jeffrey, *Generation Nowhere: Rethinking Youth through the Lens of Unemployed Young Men*, 32 PROGRESS IN HUM. GEOGRAPHY 739, 743 (2008) (noting "[t]he combination of a rapid increase in people's investment in education and a shortage of salaried employment for high-school and university matriculates has created a vast problem of educated unemployment among young people, which, while far from new, has become much more visible and intense in the 1990s and early 2000s in Asia.").

202. *Id*.

203. Kotaro Hara et al., *Worker Demographics and Earnings on Amazon Mechanical Turk: An Exploratory Analysis*, EXTENDED ABSTRACTS OF THE 2019 CHI CONF. ON HUM. FACTORS IN COMPUTING SYS. (2019).

204. *Id*.

205. Carlos Toxtli, Siddarth Suri & Saiph Savage, *Quantifying the Invisible Labor in Crowdwork*, 5 PROCEEDINGS ACM ON HUM.-COMPUT. INTERACTION 1–26 (2021).

bottom, wages did not skew or bunch to reflect differences in a given country's standard of living.[206]

In many ways, electronic piecework for platforms like MTurk followed the path carved by outsourcing service work to the Global South. In the mid-1990s, in the wake of improvement in standardization and technology, firms discovered that they could ship information-related tasks off-shore. Jobs were filled by workers who spoke English but accepted much lower pay. Large multinationals like British Airways shipped jobs to their English-speaking divisions located in former British colonies of the Global South, like India, Egypt, and the Philippines. Outsourcing provided multiple advantages: beyond cost cutting, firms were also able to avoid U.S. and British labor regulations by sending jobs overseas.[207]

As outsourcing increased, India took steps to boost its attractiveness to multinationals. Notably, the country developed the "Software Technology Parks of India" (STP) in every major city, as part of its program of economic liberalization. Cities installed high-speed broadband Internet infrastructure and power grids to feed technology parks, and intermediaries aggregated office space to offer technology for rent for the worker who couldn't afford to own.[208] As was true during eighteenth and nineteenth century colonialism of India, development in India skewed towards exported services.[209] Indeed, many states appear to have prioritized technology parks rather than water or sewer systems because the former boosted the country's ability to provide economic services and support to global customers.[210]

In the United States, outsourcing soon spread domestically, as firms shipped jobs off-site to third-party vendors in the United States, further

206. *See* Panos Ipeirotis, *Analyzing the Amazon Mechanical Turk Marketplace*, 17 XRDS: CROSSROADS 16–21 (2010) (showing value of HITS in U.S. dollars).

207. Gray & Suri, *supra* note 102, at 55.

208. *See* Geetha Vadyanathan, *Technology Parks in a Developing Country: The Case of India*, 33 J. TECH. TRANSFER 285, 290 (2008).

209. *See generally* Pravahar Sankoo & Ranjan Kuma Dash, *What Drives India's Surge in Service Exports?*, 40 WORLD ECON. 439, (2017) (analyzing the factors driving India's skewed export service economy). A range of literature establishes that British colonialism has had very long-lasting effects on measures of economic well-being for India. For example, one study compares areas under direct British rule with areas in the country under the rule of kings who reported to Britain. This study finds support for the idea that by putting in place institutions that were designed to extract resources for Britain, rather than foster domestic growth in India, colonialism explains much of India's poverty. Lakshmi Iyer, *Direct versus Indirect Colonial Rule in India: Long Term Consequences*, 4 REV. ECON. & STAT. 693, 706-08 (2010).

210. *See* Nick Chism, *India Needs to Build More Infrastructure Fast. Here's How,* WORLD ECON. F. (Oct. 6, 2016), https://www.weforum.org/agenda/2016/10/india-infrastructure-investment-kpmg/ (describing the crossroads between engaging as a global services export provider and budgeting for internal development).

fissuring the workplace. This kind of outsourcing enabled firms to avoid bargaining with unions, as independent contractors who did not work in the same place, or employees of third-party vendors were far less likely to organize.[211]

Crowdsourcing followed much the same pathway. Electronic, paid crowdsourcing sites like MTurk first emerged in 2006, and scaled up in earnest in 2009, around the time Li went looking for workers. Now workers were virtually available and almost completely anonymous—on sites like MTurk and Crowdflower, they were assigned a number and were not allowed much contact with the requesting firms. At the same time, requesters could reject the work, and platforms like Amazon refused to mediate any conflicts over rejecting, maintaining that the dispute was between requester and worker.

Academic researchers and innovative firms began to depend heavily on these sites, lured by the seemingly endless supply of cheap workers to whom the innovator owed no allegiance.[212] As innovators relied more heavily on MTurk, the site in turn developed a special relationship with workers in India, who seemed particularly well-suited to jobs in the United States given their ability to speak English.

At the outset, Indian workers were eligible only to be paid through Amazon gift cards, and Indian workers only made up about 8% of workers in 2008. In 2010, responding to pressure from both workers and requesters, MTurk enabled workers from India to be paid in rupees, which dramatically increased the number of workers from India, from below 20% to over 35%, and then quickly to over 50%.[213]

Indian Turkers flooded into MTurk just as Li recognized ImageNet's need. The influx of extremely cheap workers gave ImageNet the ability to scale up very quickly, even as the demand for the dataset was highly uncertain. Perhaps just as important, MTurkers also gave ImageNet "just-in-time" production: the ability to scale up and down, as

211. *See* DAVID WEIL, THE FISSURED WORKPLACE: WHY WORK BECAME SO BAD FOR SO MANY, AND WHAT CAN BE DONE ABOUT IT 77 (2017) (outsourcing motivated in part by the desire to cut labor costs and avoid a unionized workforce).

212. *See* Gabriele Paolacci, Jesse Chandler & Panagiotis Ipeirotis, *Running Experiments on Amazon Turk*, 5 JUDGMENT & DECISION MAKING 411 (2010).

213. Ipeirotis, *supra* note 197. In 2012, in response to changes in payment systems regulation, Amazon required workers to provide social security numbers, names and addresses. New account applicants were also asked to provide such information on registration. The overwhelming majority of international workers and new applicants, including those from India, were unable to provide such verification, and the number of Indian workers dropped to around 17%. Kristy Milland, *The Unsupported Crowd: Exclusion of Indian Workers in Amazon Mechanical Turk Communities*, GLRC GRADUATE STUDENT SYMP. (2017). Recently, Amazon has again made changes enabling those Indian workers who were able to remain in the system to link to a U.S. bank account through an interface called "Hyperwallet" and to be paid in rupees. *Id*.

the need arose, at a moment's notice. The Indian workers waited in reserve on MTurk, invisible in another country except for their electronic I.D.s in another country; their services were on demand when needed, there when ImageNet needed them, and gone when the project was completed.

Academic research has come to depend heavily on MTurk for reliable and cheap workers for "human intelligence tasks": as research subjects, as data annotators and cleaners, and more.[214] Critics have argued that academic researchers' use of MTurk constitutes sweatshop labor, even taking into account the variation in labor market conditions among the countries from which workers come.[215] In addition, they point out that the anonymity of workers on MTurk and other microlabor markets contributes to the narrative of innovation as the work only of solo groundbreaking researchers and entrepreneurs.[216] By hiding workers behind user interfaces that require only numbers to identify the workers, the use of these workers allows researchers to see themselves as solo innovators and not researchers who are part of a team of workers.[217]

As these three case studies illustrate, some of the country's most high-profile innovators in the digital economy relied on exploiting workers of color to get their innovations off the ground. To cut costs and make the personal computer affordable, Apple exploited immigrant women to solder circuit boards in their kitchens for pennies a board. To successfully compete against Lyft in a price-war, Uber relied on full-time and part-time drivers of color and immigrant drivers, who continued to sign up to drive even after fares were cut in half. To complete the ImageNet project on time and on budget, Fei-Fei Li exploited MTurk workers from India to label dataset images for less than a dollar a day. The following Section explores in more detail the way that racial exploitation paid off for these innovators.

IV. PAYOFFS

This Section identifies the ways in which racial exploitation has paid off for innovators. In general, the innovators in our case studies racially exploited workers to secure the ideal workforce for launching a digital innovation: a workforce that is cheap, super productive, flexible

214. *See* Paolacci et al., *supra* note 212, at 413-14.

215. Lily Irani & M. Six Silberman, *Turkopticon: Interrupting Worker Invisiblity in Amazon Mechanical Turk*, CHI '13: PROCEEDINGS SIGCHI CONF. ON HUM. FACTORS COMPUTING SYS. 611, 612 (2013), https://dl.acm.org/doi/10.1145/2470654.2470742.

216. *Id*.

217. *Id*.

(easy to hire and fire), able to scale up explosively (or down) in record time, and easy to recruit.[218]

- Racial exploitation gave innovators access to workers of color that were cheaper than what innovators would have had to pay if they'd hired white workers. As we have seen, workers from India on MTurk cost ImageNet half of the wage that workers from the United States would have cost.[219] Apple would have struggled to make the Mac cheaply enough to be commercially successful if it had not underpaid immigrant women to wire circuit boards.
- Racial exploitation generated more work for less pay. As we will see, workers of color and immigrant workers are more willing to accept high demands on productivity even as innovators pay them low wages. Research suggests that employers see workers of color as more expendable and able to work harder for less.
- Racial exploitation gave innovators flexibility and scale, enabling them to blitzscale quickly to large and dramatic growth and then scale down again if necessary. MTurk made hundreds of thousands of Indian workers available to ImageNet at a moment's notice, available to work in parallel, and just as easily fire-able. Apple and its vendors saw immigrant women as expendable, there when the firm needed them, and easy to let go when they didn't.
- Racial exploitation gave innovators speed. Li would have taken nineteen years to complete ImageNet if she'd had to use her research assistants. Uber was able to scale up explosively in less than three years, thanks to immigrant drivers and drivers of color without a four-year degree.
- Racial exploitation was efficient because it was self-reinforcing. Because job search networks are racially segregated, they funnel even more workers into racially exploitative work. Innovators in our case studies could rely on word-of-mouth through job search networks to hire

218. REID HOFFMAN & CHRIS YEH, BLITZSCALING: THE LIGHTING FAST PATH TO BUILDING MASSIVELY VALUABLE COMPANIES 101-02 (2018). High gross margins have proved key to the kind of explosive growth that confers first-mover advantages for digital innovators.

219. Hara et al., *supra* note 203.

and exploit more immigrant workers and workers of color.

The following discussion elaborates on each of these in turn.

A. *Cheaper Workers and Lower Labor Costs*

The hallmark of racial exploitation is an employer who pays workers of color less than the marginal revenue product of their labor. This Section argues that racial exploitation created a class of workers who were available to do the work that innovators needed, at a wage that was lower than what employers would have had to pay if they had tried to recruit white workers.

These workforces were extremely occupationally segregated. For example, the vast majority of workers who wired circuit boards for Apple were immigrant women—at least 75% and up to 100% by one estimate.[220] Likewise, full-time drivers of color were and are 70-90% workers of color depending on location. Close to 40% of the MTurk workers who labeled data for ImageNet were from India.[221]

These workforces also exhibited racial gaps within occupational strata. Recall that workers in India made $1.41 an hour where U.S. workers made $3.01—still far less than minimum wage but well more than twice what workers in India made.[222] Likewise, similar evidence suggests that white drivers will not put a car on the road for the same fare that a driver of color will. The racial composition of the driver workforce provides strong evidence of different reserve wages. In addition, empirical research described above shows racial differences in quit elasticities (percentage of workers who will quit when wages are dropped) for ridehail driving. In addition, current wage differences shed some light on the subject: according to a 2017 industry survey, after expenses, Black Uber and Lyft drivers earned $13.96 for an hour of driving compared to the $16.08 average for all other drivers.[223]

220. Hossfeld, *Hiring Immigrant Women*, *supra* note 113, at 166.

221. TIME, The On-Demand Economy Survey, *supra* note 3 (drivers); Ipeirotis, *supra* note 197, at 2 (Turker survey shows 34% from India).

222. *See* Hara et al., *supra* note 203; *see also* Ipeirotis, *supra* note 206.

223. Harry Campbell, *2017 Driver Survey Results*, RIDE SHARE GUY (2017), https://therideshareguy.com/uber-driver-survey/. Though this study did not directly attribute the wage gap to the difference in the types of either driving (full-time driving puts more wear and tear on a driver's vehicle) or locations of rides based on where drivers live, other scholars have suggested that these factors can explain wage gaps for gender. Cook et al., *supra* note 9; Emma Hinchliffe, *Yes, There's a Wage Gap for Uber and Lyft Drivers Based on Age, Gender and Race*, MASHABLE (Jan. 18, 2017), https://mashable.com/article/uber-lyft-

This Section argues that racial exploitation created a large group of occupationally segregated workers of color whom innovators could pay less than what they would have had to pay whites to do those jobs. In some of these instances, occupational segregation operated partly as a function of the type of work being done: Apple and its vendors deliberately hired immigrant women because of stereotypes about their dexterity and passiveness.[224]

In addition, occupational segregation was also a function of the wages that employers offered. People of color were more likely to sign up for low-wage circuit board wiring, driving full-time for less than minimum wage, and labeling data for $1 an hour because they had fewer options.

Workers of color were also more likely to remain on the job when wages dropped. For example, Uber and Lyft dropped fares by as much as 40% from 2014 to 2019, which meant that drivers were earning subminimum wage in many metropolitan areas. Racial exploitation enabled the ridehail firms to drop wages while retaining a largely minority full-time workforce to keep cars on the road. Owing to their lack of outside options, immigrant drivers and drivers of color continued to drive and continued to sign up to drive, even as wages dropped.[225]

Racial exploitation also paid off because innovators could pay workers in these occupational strata less than what they would have had to pay whites to do the same job. Exploiting the Indian MTurk workers and other "independent contractor" ghost workers lowered costs for the AI innovators because these workers were being paid far less than what firms would have had to pay workers from the U.S. to complete these tasks. Li would have had to shut down the project if she had not located MTurk workers who could be paid pennies per label. Likewise, Uber and Lyft were able to put and keep cars on the road, and to put them in key places at key times, because workers of color made up their full-time driving workforce.

Finally, innovators saved on labor costs by employing these workers of color in fissured work arrangements. Because both full-time drivers and ghost workers were not directly employed by innovators in any of these case studies, firms were able to save costs associated with direct employment such as overtime, retirement, health care benefits, and occupational safety protections. Current estimates suggest that direct employment raises costs on average by one third.[226] Some recent research

wage-gap-rideshare#:~:text=Women%20drivers%20reported%20earning%20an,between%20ages%2018%20and%2030 (analyzing racial gaps in results of survey).

224. Hossfeld, *supra* note 111, at 162.

225. *See supra* Part IIIC.

226. Dubal, *supra* note 171, at 6.

suggests that racial exploitation has made fissured work arrangements possible—workers of color are more likely to sign up for full-time jobs that lack benefits and protections.[227] If true, racial exploitation also paid off for digital innovators in our three case studies because fissuring enabled them to save on direct employment costs.

B. *The Churn and Increased Productivity*

Racial exploitation also pays off because notions of racial expendability lead innovators to treat workers in a way that gets more work out of them for less pay. Full-time workers of color frequently work far harder and for longer hours than do white workers.[228] In general, ridehail drivers work hard. A survey of drivers in Los Angeles documents that 58% of surveyed drivers surveyed drove more than five days a week and 50% drove more than eight hours a day.[229] This sort of intensity may explain the high rates of quitting for drivers. Research shows that 60% of all drivers have quit within six months. A very high fraction quit after one month.[230]

Instead of improving pay or working conditions, Uber and Lyft simply replace workers when they quit, on average within months of starting, resulting in a high rate of churn. Churning practices emerged early in Uber's launch. Internal communications reveal that from the outset, Uber leadership chose to replace unhappy drivers rather than improve their pay or experience.[231] When Uber launched a carpooling product in New York, the firm sent around a survey of drivers to see how the launch had gone and to decide whether to continue. Drivers responded with anger and frustration at both the roll-out and rapidly fluctuating hourly rates. Tellingly, managers reacted by focusing on driver grammatical errors and spelling difficulties. "God, I can't believe these people's votes count the same as ours," one manager said.[232]

Because churning sees workers as replaceable and fungible, it is likely associated with racial bias. A recent body of literature demonstrates that

227. *See* Cara Brumfield, Adam Tessfaselassi, Chris Geary & Siddhartha Aneja, *Concentrated Power, Concentrated Harm: Market Power's Role in Creating and Amplifying Racial and Economic Inequality*, GEO. CTR. OF POVERTY AND INEQ. 8, 14-20 (2022), https://www.georgetownpoverty.org/wp-content/uploads/2022/03/Concentrated PowerConcentratedHarm-March2022.pdf.

228. *See, e.g.*, PARROT & REICH, *supra* note 4; Benner, *supra* note 4.

229. UCLA INSTITUTE FOR RESEARCH ON LABOR AND EMPLOYMENT, MORE THAN A GIG: A SURVEY OF RIDEHAILING DRIVERS IN LOS ANGELES (2018), https://www.labor.ucla.edu/wp-content/uploads/2018/06/Final-Report.-UCLA-More-than-a-Gig.pdf.

230. *Id*.

231. MIKE ISAAC, SUPERPUMPED: THE BATTLE FOR UBER 190 (2019).

232. *Id*.

people who are members of the racial majority dehumanize out-group members and consider them expendable.[233] Dehumanization is all the more likely when work practices strip workers of their identities and in-person interactions and mediate the interactions electronically. From the employer's perspective, it makes the humans seem interchangeable, as each worker is represented by a worker I.D.: everything that makes someone a person, such as their beliefs, attributes, and experiences, is stripped away from this identifier.[234] Free of meaningful interaction with labor, innovators can get projects up and running without having to negotiate labor terms or provide living wages for the people who make their projects possible.

Churning through workers considered expendable has a long history in slavery and Jim Crow, as well as Mexican and Asian agricultural workers.[235] But it's not just racial bias that explains the churn—churning pays off economically as well. In the case of ridehailing, for example, Uber and Lyft relied on being able to slash wages without fear of triggering massive driver exit, knowing that the company would continue to have an always-available pool of full-time drivers to handle the majority of rides. Fissured work arrangements also enable the churn; given the reduced commitment to workers, companies find it much easier (and less costly) to lose workers and replace them than to make the effort to retain them.

C. *Ability to (Blitz)Scale*

Racial exploitation has offered innovators racially-defined groups with millions of workers, which translates both to the ability to churn and the ability to scale. In the ghost workers story, access by digital innovators to thousands of Indian workers in cyberspace was key to scaling up the database to include millions of images. Professor Li's Imagenet project used 49,000 workers to complete the project in two and a half years, and the database contained 3.2 million images at the end of her effort.[236]

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233. Leticia Y. Florez & Julia Z. Deal, *Work-Related Pain in Mexican American Custodial Workers*, 25 HISP. J. BEHAV. SCI. 254, 259 (2003) (Latin workers' physical pain is understudied because low-income workers of color are dehumanized and seen as expendable); *see also* J. Corey Williams, Nientara Naderson, Terrell Holloway, Ezelle Samford III, Jeffrey Eugene & Jessica Isom, *Reopening the United States: Black and Hispanic Workers are Essential and Expendable Again*, 110 AM. J. PUB. HEALTH 1506 (2020).

234. GRAY & SURI, *supra* note 102, at 5.

235. *See e.g.*, David Roediger, The Production of Difference: Race and the Management of Labor in U.S. History 61 (2012) (documenting the construction industry's churn through Chinese workers who were considered expendable.).

236. Deng et al., *supra* note 193, at 4.

Digital job boards help to supply this kind of scale of workers from the Global South. At any one time, there are between two and five thousand workers on MTurk: in real terms, this number supplies a firm with the equivalent of between ten and twenty-five thousand full-time employees.[237] And like Uber, MTurk exhibits a fairly high degree of churn—on average, 50% of the worker population changes every year.[238] In any event, the access to workers who can complete tasks in parallel makes innovation faster, easier, and more cost-effective.

This kind of scale is key to the winner-take-all growth essential to succeeding in the digital space. Scale and speed together are powerful competitive advantages.[239] Blitzscaling is an essential strategy to navigate "two sided" markets like digital platforms that have positive network effects.

For example, in ridehailing platforms, the technology is valuable because it connects riders with a network of drivers, and drivers with a network of riders. Riders will choose the company with more drivers because their wait times will be lower. In turn, drivers will prefer to work for the company with more riders. Thus, an early explosive increase in drivers can generate a competitive "first mover" advantage that will snowball over time, securing exponentially more market share as more drivers attract more riders, and in turn more riders attract more drivers.[240]

Uber had its eye on this blitzscale strategy from the beginning. Bill Gurley, a Benchmark partner and early Uber investor, set the strategy out in a blog post entitled "All Markets Are Not Created Equal." As the company grew, it was able to put more cars on the road. Along with Uber's investment in route and load optimization, more cars translated to shorter pickup times, even at the risk of having too many cars on the road to be efficient.[241]

More generally, digital platforms are an innovation that relies on workers signing up for jobs with low or uncertain wages, no job security, and no benefits. Gates says that all of this blitzscaling is possible because

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237. Djellel Difallah, Elena Filatova & Panos Iperotis, *Demographics and Dynamics of Mechanical Turk Workers*, PROCEEDINGS OF THE 11TH ACM INTERNATIONAL CONFERENCE ON WEB SEARCH AND DATA MINING (2018), https://www.researchgate.net/publication/322969840_Demographics_and_Dynamics_of_Mechanical_Turk_Workers.

238. *Id*. at 140 (half of all workers leave the platform every year).

239. Bill Gates, *Foreword to* REID HOFFMAN AND CHRIS YEH, BLITZSCALING: THE LIGHTING FAST PATH TO BUILDING MASSIVELY VALUABLE COMPANIES ix-x (2018).

240. *Id*. at ix. For a discussion of network effects for ridehails, describing a five-minute wait time threshold, see D'Arcy Coolican & Li Jin, *The Dynamics of Network Effects in Practice*, ANDREESSEN HOROWITZ (Dec. 13, 2018), https://a16z.com/2018/12/13/network-effects-dynamics-in-practice/.

241. HOFFMAN & YEH, *supra* note 239, at 45.

of the thriving ecosystem of temp workers, sometimes in the United States, but often in other countries.[242]

D. *The Need for Speed*

Because racial exploitation lowers costs, increases productivity, and enables large scale, it enables innovators to speed up their launch to become an industry first-mover, with an emphasis on the word "first." Once Uber launched the ridehail component of its operations, racially exploiting full-time immigrant drivers and drivers of color enabled the firm to add around 460,000 new drivers in two to three years.[243]

Likewise, ImageNet was able to cut its launch time to a tenth of its original projections. Recall that Li had estimated it would take two decades to complete the project if she had paid her research assistants $10 to label data. Instead, after discovering that MTurk could give her access to hundreds and thousands of workers at pennies per label, she was able to finish the project in two and a half years.

E. *Self-Reinforcing Exploitation*

Finally, racism makes it easier for innovators to launch a new project because racial exploitation is self-reinforcing. Racial exploitation populates job search networks with underpaid and exploited job contacts. And, as argued earlier, these networks are likely to distribute exploitative jobs to people of color. Because firms in the digital economy tend to be racially segregated as one moves from top to bottom, job search networks for workers of color at the bottom will continually allocate exploited jobs to immigrant workers and workers of color, both in the short and long term.

Take the ridehail industry, for example. People of color and immigrants are at the bottom of each category of work at Lyft, while mostly whites (and some Asians) are at the top.[244] White workers dominate the group of workers that make up the leadership team and other high-skilled, well-paid positions. Workers of color dominate the group with

242. Gates, *supra* note 239, at ix-x.

243. Hall & Krueger, *supra* note 4, at 710 tbl.1.

244. On an eight-person board, all but one are white or Asian. Valerie Jarrett was appointed in July of 2017, after Lyft founder John Zimmer had made widely-derided comments in March 2017 that the company was "woke." Katy Steinmetz, *How Lyft is Capitalizing on Uber's Scandals*, TIME (Mar. 28, 2017), https://time.com/4712746/lyft-interview-uber/ (Zimmer woke comments); Faiz Siddiqui, *Former Obama Adviser Valerie Jarrett joins Lyft Board*, LA TIMES (July 31, 2017), https://www.latimes.com/business/technology/la-fi-hy-lyft-valerie-jarrett-20170731-story.html.

low-skilled, no-college, low-wage positions; almost all of Lyft's employees of color are found in this group.[245]

These workers are both the recipients of network referrals and, once they've secured a job, the referees for other people's networks. At the top, investors and board members will refer positions to their contacts in predominantly white and some Asian networks. At the bottom, ridehail drivers will refer driving positions to their contacts in predominantly Black, brown, and immigrant networks. Recognizing the value of these self-reinforcing networks, early on, Uber paid drivers for referrals. In 2013, Uber offered payments of $700 for driver referrals, as long as the new driver completed a certain number of trips (typically forty).[246]

Because exploitation operates through job search networks, and job applicants become sources of referral in their own network, digital innovators can develop exploitation pipelines in a sort of snowball sampling dynamic. Self-reinforcing exploitation is efficient, in a sense: innovators like Apple and Uber don't have to continually recreate the machinery to recruit people who will take low wages.

V. REMEDIES: REVALUING EXPLOITED LABOR

In each of the case studies discussed above, racial exploitation played an important role in launching the innovation. Outsourcing circuit board work to immigrant women, who were paid a few dollars per board, helped Apple to sell the Mac at a commercially successful price point, the key to its success. Hiring full-time drivers of color at subminimum wages helped Uber and Lyft to blitzscale their way towards market dominance, and then to slash prices on base fares in a price war between the two competitors. Paying full-time workers from India on MTurk $3 an hour or less to label images helped Fei-Fei Li to complete ImageNet in two and a half years and on budget instead of twenty years and hundreds of thousands of dollars more. These workers were racially exploited because employers were able to avoid paying their workforce the marginal revenue product of their labor.

This Section argues that we should value the labor of these essential workers as we do workers higher up the ladder. Innovators should pay these workers the marginal revenue product of their labor, either at the time they completed the work or, at the worker's choice, in some form of deferred compensation. In addition, workers should share control over their wages and working conditions, and they should share in the profits that come from start-ups' commercial success.

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245. EQUAL EMP. OPPORTUNITY COMM'N, 2017 EMPLOYER INFORMATION REPORT (2017), https://take.lyft.com/diversity/EEO1-Reports-2018.pdf.

246. Robinson, *supra* note 172, at 27.

As noted at the outset, this Section focuses more on sketching the outlines of types of interventions that might reduce racial exploitation. Until the problem is well-understood and empirically identified, programmatic policy prescriptions are premature. For example, more research is needed to determine the conditions in which racial exploitation pays off for innovators. Additional work is needed to determine the reason for racial differences in quit elasticities as well.

Nevertheless, four general categories of interventions are explored in the discussion below. The bulk of the discussion below takes up ways in which they might be tailored to address racial exploitation, either specifically or as part of a more general effort to build worker power. The categories of intervention include:

- Unions and sectoral bargaining to build worker power, particularly in industries that depend heavily on exploited workers of color.
- In a classic tax and transfer program, successful startups could be taxed in order to fund wage and benefit subsidies for racially exploited start-up workers.
- Wage setting bodies (wage boards, wage task forces) could set wages for digital economy start-ups, particularly in platform startups or in industries like ridehailing that disproportionately depend on the labor of workers of color. These bodies could potentially get wages closer to the marginal revenue product of workers' labor.
- Worker-focused institutions could build worker power and put workers (including workers of color) in the room when decisions about wages and working conditions get made. Equity funds and special classes of shares could share power and profit with workers. Governments could incentivize the creation of such equity funds by requiring startups who receive government funding (for example, small business loans or funding for technological development) to create such pro-worker institutions.

Before discussing these four categories of intervention, this Section begins by making the case that workers of color should be paid the market value of their labor, as a matter of fairness.

A. *Fair Pay*

An argument for paying digital workers the value of their marginal revenue product might focus on the material consequences of suppressed

wages to society at large (suppressed economic growth) and to communities of color. In general, power to suppress wages limits economic growth because it reduces consumer demand and underutilizes workers' productive power.[247]

Beyond general arguments about exploitation, which are not unique to workers of color, racial exploitation materially affects the well-being of workers of color. Evidence about this particular group of workers is difficult to come by, but recent data suggest that at least their current-day counterparts are the least likely to be able to absorb the impact of suppressed wages. Disproportionately minority workers who work full time for digital platform-based companies are more vulnerable to falling into poverty as the result of an unexpected financial shock: 58% of full-time gig workers said they would struggle to come up with $400 to cover an emergency bill, versus 38% of non-gig economy workers.[248] This group of workers cannot move up financially: they are less likely to be able to budget for the future because they consistently operate from paycheck to paycheck.

Suppressed wages may contribute to persistent and self-reinforcing poverty for this group. Scholars have written of the self-reinforcing poverty traps to which workers in the informal economy are far more vulnerable.[249] Above a particular threshold of income, families are upwardly mobile. Families have enough income to begin to save or invest in longer-term asset building to push the family's wealth upward on the ladder to success. Below the threshold, families' income levels put them in survival mode, and this disadvantage creates further disadvantage, pushing a family down the chute toward poverty. These are the chronically poor.[250] Racially exploited digital workers are more likely to be pushed into poverty because of, or at the very least in spite of, their work for the country's newest innovators.

Finally, fair pay today has far-reaching consequences for future generations. Today's racial exploitation helps to pave the way racial exploita-

247. Alan B. Kreuger & Eric A. Posner, *A Proposal for Protecting Low-Income Workers from Monopsony and Collusion*, THE HAMILTON PROJECT 6, 15 (Feb. 2018), https://www.hamiltonproject.org/assets/files/protecting_low_income_workers_from_monopsony_collusion_krueger_posner_pp.pdf.

248. Benner, *supra* note 4, at 19.

249. For an excellent overview of thresholds and poverty traps, see Michael R. Carter & Christopher B. Barrett, *The Economics of Poverty Traps and Persistent Poverty: An Asset-based Approach*, 42 J. DEV. STUD. 178 (2006). For more discussion of poverty traps, see also POVERTY TRAPS (Samuel Bowles, Steven Durlauf & Karla Hoff eds., 2006) (explaining the self-reinforcing dynamics of poverty traps); Costas Azariadis, *The Economics of Poverty Traps, Part One: Complete Markets*, 1 J. ECON. GROWTH 449 (1996) (exploring the theory behind poverty traps).

250. *See* POVERTY TRAPS, *supra* note 249; *see also* Azariadis, *supra* note 249.

tion for the next generation. As I have written elsewhere, racial income differences affect the next generation's access to schooling and training, which in turn fuels future racial income differences.[251] Exploited digital workers of color are less likely to be able to afford a neighborhood with good public schools or a college education, particularly in the major metropolitan areas associated with innovation (Seattle, New York, San Francisco) in which they work. They cannot give their kids a down payment on a house with which to build wealth. Conversely, paying workers of color the marginal revenue product of their labor today will build a family's ability to pay for education and training for future generations.[252]

Perhaps the best argument for paying racially exploited workers is the argument from fairness. Digital worker vulnerability in these three case studies was the product of the country's long history of racial discrimination. Innovators had the power to (and exercised the power to) set wages at drastically low levels—subminimum wage and below—because workers of color had fewer options. And these workers had fewer options in large part because of present discrimination and cumulative structural discrimination. The immigrant women who wired Apple's boards, the Black, brown, and immigrant drivers for Uber, and the workers in India for MTurk had fewer options because employers discriminated against them, because their job search networks were limited, and because colonialism and segregation limited their economic and human capital options.

On the other hand, their exploitation conferred benefits on a different group of people. The United States in general, and tech founders in particular, benefited greatly from the innovations that racially exploited workers' efforts made possible. In addition, shareholder investors and a select group of innovators who relied on these workers enjoyed dramatic profits that came with commercial success. As of 2022, the founder of Uber, Travis Kalanick, enjoys a net worth of 4 billion dollars.[253] Fairness dictates that society and the innovators themselves should have paid workers the value of their work, and that workers should have shared in the profits of the innovation's success.

B. *Unions*

Recent research shows that employer power to exploit workers is due in part to the dramatic loss of power by unions in the last several

251. *See* ROITHMAYR, *supra* note 60.

252. *See id.*

253. *The Forbes 400: The Definitive Ranking of the Wealthiest Americans in 2022*, FORBES (2022), https://www.forbes.com/forbes-400/.

decades.[254] Likewise, studies show that union membership historically benefited workers of color far more than it did white workers: as of 1962, the income boost from union membership for Black workers was five times that of white workers.[255] Notwithstanding the racist history of unions, scholars have argued extensively in favor of restoring union power as a way to reduce employer power to exploit workers by suppressing their wages.[256]

Research shows that employer power to exploit workers is blunted by unions.[257] Organizing in gig work is of course far more complicated, but workers have managed to organize, against the odds. On MTurk, workers have come together in a group called TurkOpticon, to organize and to rate employers by reliability, forcing these companies to pay attention to their reputations if they want to continue to use MTurk.[258] In advance of Uber's IPO, Rideshare Drivers United ("RDU") staged a global strike and picketed corporate gig company headquarters. In connection with the campaign over Prop 22 (the referendum to overturn Assembly Bill 5, California legislation that classified drivers and other gig workers as employees), organizations like RDU and the Gig Workers Collective organized to argue against the referendum (albeit unsuccessfully).[259]

Sectoral bargaining offers an alternative way of building worker power through unions. South Africa has had some limited success with bargaining councils in gig work: councils include management, labor and government representatives, and councils sometimes function as wage boards (discussed below).[260] Rideshare Drivers United and the Gig Workers Collective represent important sectoral bargaining efforts in the United States, but to date, they have been outgunned by Uber and Lyft in the fight over legislation to keep drivers classified as independent contractors, though the unions continue to fight.[261]

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254. *See* Henry Farber, Dan Herbst, Ilyana Kuzemko & Suresh Naidu, *Unions and Inequality Over the Twentieth Century*, (Nat'l Bureau of Econ. Rsch., Working Paper 24587, 2018), https://www.nber.org/papers/w24587.

255. *Id*. at 1, 52.

256. Dube et al., *supra* note 44, at 45.

257. Benmelech et al., *supra* note 33, at 28 (unionizing strengthens worker positions in bargaining for wages); McGregory, *supra* note 50, at 34 (unionized nurses earn a wage premium of 12.8%).

258. Russell Brandom, *Union 2.0: how a browser plug-in is organizing Amazon's micro-laborers*, THE VERGE (June 27, 2013), https://www.theverge.com/2013/6/27/4467296/turkopticon-a-labor-union-for-amazons-mechanical-turk.

259. Dubal, *supra* note 171, at 21; Veena Dubal, *The New Racial Wage Code*, 15 HARV. L. & POL'Y REV. 511, 541 n.142 (discussing the Gig Workers Collective).

260. Haroon Bhorat, Carlene Westhuizen & Suma Goga, *Analysing Wage Formation in the South African Labour Markets: The Role of Bargaining Councils*, (Dev. Pol'y Rsch. Unit, Working Paper 09, 2009).

261. Dubal, *supra* note 171, at 24-26.

An emerging literature documents digital worker efforts to organize.[262] Building worker power through conventional union organizing and sectoral organizing should be an important means to remedy racial exploitation of digital workers. Still, realistically speaking, union power has been dramatically undercut in recent decades. Unions are not likely to offer the same kind of opportunity to build worker power that they once did, either for exploited workers of color or in general, without radical changes in policy and labor law.[263] Accordingly, the following discussion offers three additional categories of remedies to consider, in addition to union organizing.

C. *Tax and Transfer Remedies: Wage and Benefit Subsidies*

Perhaps the simplest kind of approach to valuing worker labor for innovators would be a tax and transfer program that provides exploited digital workers with wage subsidies and benefits, mandated by the state and funded by taxes on commercially successful and emerging ventures (defined by some level of distribution to innovators and/or their investors) who racially exploit workers.[264] Alternatively, because society benefits from innovation (and because most start-ups fail), taxpayers could be taxed for contributions to a tax and transfer fund that financed wage subsidies.

To pay workers closer to the marginal revenue product of their labor, all racially exploited workers could be eligible for wage and benefit subsidies at the time of employment. Importantly, this category could cover all racially exploited workers, including those workers whose innovations (or the companies for whom they work) do not come to enjoy commercial success. I discuss the moral hazard issues with wage subsidies below, but those problems are in theory soluble.

The concept of tax and transfer is a theoretically appealing one because it enables targeting on both ends. Those firms who have benefited from the use of racially-exploited workers would finance the subsidies, via a tax on pure profits. Those workers who have been racially exploited (or are at risk of being racially exploited) could receive the subsidies. Also in theory, the wage and benefit subsidy would equal exactly the amount by which wages and benefits are suppressed owing to the firm's power to

262. *Id.*; Simon Joyce & Mark Stuart, *Trade Union Responses to Platform Work: An Evolving Tension between Mainstream and Grassroots Approaches*, *in* A MODERN GUIDE TO LABOR AND THE PLATFORM ECONOMY (2021).

263. Suresh Naidu, *Worker Collective Action in the 21st Century Labor Market* (2019), https://www.law.nyu.edu/sites/default/files/Naidu%20Suresh%20-%20Worker%20Collective%20Action%20in%20the%2021th%20Century%20Labor%20Market.pdf.

264. *See* Naidu & Posner, *supra* note 26.

racially exploit workers: the difference between the marginal revenue product of a group's labor and their real wage.[265] But calculating the marginal revenue product of a group's labor is notoriously elusive, which helps to explain why the Pigouvian theory of exploitation never took off until now.[266]

In reality, significant costs would be associated with quantifying the amount of wages suppressed by racial exploitation. Costs would also be associated with identifying the firms exercising such power to exploit and taxing them from the beginning of their operation. Perhaps most difficult, innovators who fail are not likely to contribute much. Given the failure rate for most digital innovators, and the speed with which they fail, it would be difficult to extract much money from these innovators. As noted above, this might argue for taxing generally—social welfare is enhanced by failed innovations as part of a broad program of exploration to identify promising areas *and* areas that are not so promising.

Policymakers would also find it costly to identify those workers who are in fact racially exploited or are at risk of racial exploitation. In addition, it would be costly to estimate the amount by which these firms are suppressing wages and benefits. Even with data on the elasticity of labor supply, the market is left to guess what wages racially exploited workers of color might have received had those workers enjoyed the same kinds of outside options that white workers enjoy.[267]

Tax and transfer programs might also be vulnerable to free-riding by firms who reduce wages even further with the knowledge that subsidies will pick up the slack. To sidestep this and other moral hazard problems, Suresh Naidu and Eric Posner have proposed a tax-and-transfer wage subsidy coupled with a requirement that a participating firm publish job descriptions, requirements, and wages in advance, and then commit to hiring the first person who is qualified for the job.[268]

The publication requirement might reduce the likelihood that firms will free-ride by reducing wages, though firms might be willing to openly free-ride. The first-come, first-hired feature reduces the firm's incentive to wage-discriminate among job candidates. As the authors note, the "take-all-comers" feature of this scheme would be even easier to institute in the digital gig economy, in which companies offer highly standardized

265. In his work on the economics of discrimination, Gary Becker calculated wage gaps by assuming that the whole of wage gaps were traceable to discrimination or exploitation, and then estimated the difference in wages to be equal to the wage gap between minority and white workers. Becker, *supra* note 78, at 4, 110.

266. *See supra* note 24.

267. *See* Joan Robinson, *supra* note 25, at 77-80.

268. Naidu & Posner, *supra* note 26, at 18.

jobs to workers who are hired based on their ability to meet a rigid set of specific qualifications.

In general, though, the difficulty of estimating subsidy amounts, identifying who should pay and who should receive subsidies, and avoiding free-riding and moral hazard, potentially make a tax and transfer program less useful in practice. Some of these problems might be solved by getting expert-driven estimates on subsidy amounts and criteria for who should pay from a wage-setting body, a category of intervention I discuss next.

D. *Sectoral Level Remedies: Wage-Setting Bodies*

Beyond solutions involving unions and tax and transfers, regulators could use wage-setting institutions to set industry-specific and region-specific wages for the bottom rung of digital economy workforces. Scholars like Kate Andrias argue that wage boards could reduce general economic inequality in the U.S. labor force.[269] She points to state wage boards in the United States (New York, California, and New Jersey)[270] which have successfully set wages for specific industries in specific regions or areas. State law in these states authorizes the governor to appoint wage boards, whose recommendations can become law if ratified properly.

In New York, for example, state law permitted the governor in 2015 to set wages for fast-food workers in the hospitality industry. The law required that the board include labor organizations representing the sector, as well as representatives for management and the public. This group of stakeholders sat as a wage board and collectively decided to phase in a $15 per hour minimum wage for fast-food workers.[271] Even earlier, in the 1990s, California's Industrial Welfare Commission adopted a set of wage orders that increased wages—twelve orders by industry, three by occupation and one general minimum wage order. The agency has been defunded since 2004 but could easily be reactivated.

Building on existing models, wage boards could set wages for digital economy startup workforces that disproportionately rely on workers of color and immigrant workers. The idea behind these boards is to require

269. Kate Andrias, *Social Bargaining in States and Cities: Toward a More Egalitarian and Democratic Workplace Law*, HARV. L. & POL'Y REV. ONLINE (2017), https://repository.law.umich.edu/articles/2000/.

270. *Id*. New Jersey requires a wage board to be empaneled if at least fifty workers in an occupation petition for a board. In all three states, wage board recommendations have the force of law if they are reviewed and approved by state authorities. Dylan Mathews, *Governors in these states can give workers raises with the stroke of a pen*, VOX (July 19, 2019), https://www.vox.com/future-perfect/2019/7/19/20698079/wage-boards-union-labor-movement-california-colorado-new-jersey.

271. Kate Andrias, *The New Labor Law*, 126 YALE L. J. 1, 53 (2017).

that workers be paid wages that are closer to the marginal revenue product of their labor, though as noted earlier, precise estimates are difficult and costly. Still, there are ways to estimate required wages, not just at the bottom as a minimum wage does, but further up the distribution.

While details can vary, wage boards could choose to peg the required wage to the median or mean wage of others doing work with the firm or in the profession. So, for example, driver wages could be set at 30% of the median wage of workers in the occupational category. More radically, for workers who support innovations that create new markets, wages could be pegged to the mean wage of *all* start-up workers in the newly emerging industry.

Practically speaking then, Uber and Lyft driver wages at the outset could have been pegged to the mean compensation for all ridehail workers, to include not just drivers but programmers and executives up the ladder. This reference strategy could enable wage boards to benchmark marginal revenue product estimates by looking at other occupational categories in the emerging industry. Wage boards could also adopt wage scales to adjust for experience and region of the country. Finally, wage boards could require that exploited workers be provided benefits, through employer benefit programs or less ideally, portable benefit funds to which the employers would be required to contribute.[272]

Of course, identifying the amount by which racial exploitation suppresses wages is difficult, particularly in new industries, where startups are disproportionately located. Setting wages for fast-food workers in a long-standing industry is not the same as setting wages for data labelers on MTurk or drivers in ridehail, though there are analogous occupations to use as benchmarks.

To deal with the "new occupation/market" problem, and to provide more cash for startups to enable continuing innovation, wage boards could make use of deferred compensation methods that startups routinely use to compensate other less-exploited workers in emerging markets. Recently launched digital firms often prefer to invest the cash they have on hand into growth initiatives and choose equity compensation to attract employees.[273] Wage boards could require that firms allow workers to negotiate this as well. Wages could be paid via deferred cash or stock appreciation rights, which entitle recipients to the cash dividend benefits

272. For an extended discussion of portable benefit funds, and the need for regulation to require contributions for gig workers, see Liya Palagashvili, *Barriers to Portable Benefits Solutions for Gig Economy Workers*, CTR. FOR GROWTH & OPPORTUNITY (Oct. 21, 2020), https://www.thecgo.org/research/barriers-to-portable-benefits-solutions-for-gig-economy-workers/.

273. HERBERT KRAUS, EXECUTIVE STOCK OPTIONS AND STOCK APPRECIATION RIGHTS (2021).

of stock appreciation during the period between the date of the grant and date of receipt of compensation payment.

Questions remain about whether to give workers the choice of whether to accept deferred compensation, for fear of reducing innovation. In theory at least, workers might choose deferred compensation if demanding the wage-board set wage would cause the firm to shut its doors. In practice, owing to need, low-income workers are more likely to choose cash in hand over deferred compensation.[274]

Still, these are the kinds of choices that executives and programmers regularly are given. Giving workers control over such a decision could acknowledge the lack of freedom that workers face owing to their lack of options. Given the high failure rate of startups, deferred compensation is a risky choice that workers might do well to avoid. And startups with greater chances of success are more likely to be able to attract investor capital to finance present-value wages.

Among other important advantages, wage boards allow for sectoral decision-making rather than at the level of the firm, as is common with union bargaining. Wage boards can set wages for all sectoral workers, not on the basis of the worker's status as employee or independent contractor, but on the type of work and skills involved.[275] In this way, wage boards could help to reduce startup's incentives to cut costs by contracting out work to third party vendors or independent contractors.

A common criticism of proposals to require industry to increase wages is that raising wages reduces the number of jobs available and increases unemployment. A robust body of research on the link between wage increases and employment levels suggests that concerns about job loss from wage raises are potentially overblown.[276] In a meta-analysis of over 200 scholarly studies, researchers concluded that modest minimum wage increases raise wages for the working poor without substantially affecting employment or work hours.[277] Likewise, more recent research

274. *See* Anuj K. Shah, Sendhil Mullainathan & Eldar Shafir*, Some Consequences of Having Too Little*, 338 SCI. 682, 683 (poor people choose in order to be able to meet today's needs) (2012).

275. David Madland, *Wage Boards for American Workers*, CTR. FOR AM. PROGRESS (Apr. 9, 2018), https://www.americanprogress.org/article/wage-boards-american-workers/.

276. Most famously, Card and Krueger showed that an increase in the minimum wage from $4.25 to $5.05 in New Jersey and Pennsylvania did not change employment levels; while fewer workers were hired, fewer workers quit, offsetting the reductions in hiring. This study and other corroborating research is discussed at length in DAVID CARD & ALAN B. KRUEGER, MYTH AND MEASUREMENT: THE NEW ECONOMICS OF THE MINIMUM WAGE (2016).

277. DALE BELMAN & PAUL WOLFSON, WHAT DOES THE MINIMUM WAGE DO? 401 (2016) (meta-analysis). For other research concluding that minimum wage rules do not affect work hours or employment, see also Megan de Linde Leonard, T.D. Stanley & Hristos Doucouliagos, *Does the UK Minimum Wage Reduce Employment? A Meta-Regression*

confirms that mandatory wage increases in seven states have not reduced the number of jobs that pay below the minimum wage, but increase by approximately the same amount the number of jobs that pay above minimum wage, suggesting that firms have the capacity to absorb wage increases.[278]

Of course, this research surveys firms at all levels of maturity, not just start-ups, and modest increases in wages, not potentially larger increases. Extrapolating from such research may prove imprecise. To address this issue, pilot wage boards could experiment with gradual and temporary wage increases to observe possible effects on unemployment, and as well as other unintended consequences.

E. *Firm Level Remedies: Sharing Profits, Sharing Control*

At the level of the firm, workers should share ownership and control over their wages and working conditions, and to share in the profits of innovation as well. Traditionally, the power to control wage-setting and working conditions resides in a small group of decisionmakers in a start-up firm. Typically in start-ups, this group at the top of the pyramid is predominantly white, and workers at the bottom rung of the ladder are disproportionately workers of color and immigrant workers. Employees, who contain more of the company's workers of color, are rarely in the room. Workers of color who are independent contractors (so-called) and workers for third-party vendors typically have no voice whatsoever. As noted earlier, investors and executives at rideshares tend to be white, and drivers are almost 75% people of color and immigrants.[279]

Workers of color can build power to fight racial exploitation by acquiring equity in the firm and a voice in the room where wages are set.[280]

Analysis, 52 BRITISH J. INDUS. RELS. 499 (2015); Paul J. Wolfson & Dale Belman, *15 Years of Research on U.S. Employment and the Minimum Wage* (Tuck Sch. of Bus., Working Paper No. 2705499, 2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2705499.

278. In a comprehensive analysis, Cengiz et al. show that in the U.S., there is little evidence of either overall job loss or losses for lower skilled groups for minimum wages that are up to half the median wage for full time workers. *See* Doruk Cengiz, Arindrajit Dube, Atilla Lindner & Ben Zipperer, *The Effect of Minimum Wages on Low-Wage Jobs*, 134 Q. J. ECON. 1405 (2019). *See also* HER MAJESTY'S TREASURY, IMPACTS OF MINIMUM WAGES: REVIEW OF THE INTERNATIONAL EVIDENCE, 2019 (UK), https://www.gov.uk/government/publications/impacts-of-minimum-wages-reviewof-the-international-evidence (report by Arindrajit Dube for Her Majesty's Treasury) (increase in wages in seven states has not triggered job loss).

279. *See supra* notes 203-205 and accompanying text.

280. Lisa Fairfax argues that social justice issues, which would include the racial exploitation of workers of color, are appropriate subjects of shareholder activism. Lisa Fairfax, *Social Activism Through Shareholder Activism*, 76 WASH. LEE U. L. REV. 1129 (2019).

Scholars and shareholder activists have argued that worker stock ownership plans are a particularly useful way of sharing control (and profit) among workers in a labor-based digital platform economy.[281] In the United States, union pension funds and other shareholder activist groups have had some success in arguing for changes to corporate decision-making, focused mostly on proxy requirements and representation on corporate boards.[282]

Other countries have begun to turn to worker equity funds to tackle racial exploitation in particular. For example, in a radical attempt to shift power to workers, the African National Congress party in South Africa has recently targeted worker ownership as a cornerstone to a post-Covid rebuilding of the country's economy to redress persistent apartheid-created race and class inequalities.[283] The party has discussed plans for worker stock-ownership in which worker-co-ops are allowed to use unclaimed pensions to purchase worker shares, to be put in trust. (Alternatively, the co-op would take out a loan underwritten by the firm, and the firm would pay each worker a bonus to be used to pay for worker shares over time).[284] Shares would be nonalienable and kept within the co-op, and they would be repurchased after a set amount of time or on worker exit, to be reallocated to current workers. South African law makes room for worker ownership, allowing "other persons closely involved with the business" to participate in share plans.[285]

In addition to compensating workers for their essential contributions, a chief upside of worker ownership here in the United States (and in South Africa) is that workers (or their representatives) can wield power to actively argue for wages and working conditions favorable to workers. In South Africa, worker-shareholders have the power to block certain decisions (at 25% of shares) that have to do with those shareholders or call for court approval of certain resolutions (at 15%).[286] There is prece-

281. Naidu & Posner, *supra* note 26, at 24 (discussing shareholder activism and codetermination).

282. *See* EKREM SOLAK, SHAREHOLDER ACTIVISM AND THE LAW 66-78 (2020) (outlining the various players who have pressed successfully for ESG (Environmental, Social and Governance) priorities in investing).

283. AFRICAN NATIONAL CONGRESS, LET'S GROW SOUTH AFRICA TOGETHER (2019); Telephone Interview with Phillip Dexter, Chief Operating Officer, NEHAWU (Nat'l Educ. Health and Allied Workers' Union) Inv. Holdings (Oct. 23, 2020).

284. David Ellerman and Michelle Galloway, *Employee Stock Ownership Plans—A Viable Option for South Africa?* DAILY MAVERICK (Mar. 22, 2019), https://www.dailymaverick.co.za/article/2019-03-22-employee-stock-ownership-plans-a-viable-option-for-south-africa/.

285. Section 95(1)(c) Companies Act 2008.

286. MADELEIN VAN DER WALT ET AL., SHAREHOLDERS' RIGHTS IN PRIVATE AND PUBLIC COMPANIES IN SOUTH AFRICA: OVERVIEW, THOMSON REUTERS PRACTICAL LAW (2021), https://uk.practicallaw.thomsonreuters.com/w-012-0427?transitionType=

dent for workers and shareholder activists shaping corporate decisions about wages for non-employee workers; in 2001, workers and shareholder activists at several companies mounted a concerted campaign designed to raise third-party vendor maquiladora wages (by 10%) and working conditions.[287] For worker shareholders, wages are more than a question of corporate social responsibility; these shareholders or their representatives would be best positioned to advocate on their behalf regarding wages and working conditions.

Of course, the greatest challenge to such a proposal is that workers must create a governance structure that effectively represents a wide range of workers, who often have heterogeneous interests.[288] It might be possible to create well-defined worker co-ops that bring together workers who share interests—ridehail drivers, for example.

In addition, worker ownership funds likely would operate most effectively for innovator firms that are already quite well-developed and have already reached commercial success. Indeed, as mature companies, Apple, Uber, and Lyft recently implemented worker equity, the latter two as part of their IPOs. Apple recently extended worker shares to all its employees, though not to the workers for third-party vendors who supply circuit boards.[289] Implemented now, a worker equity fund proposal could require Apple to create a fund for those racially exploited workers who are employed by the third-party vendor.

Likewise, under pressure from driver organizers, Uber and Lyft extended worker shares to its full-time drivers in 2019. Drivers were furious about the new class of billionaires that ridehail IPOs would create. In response, both firms created equity for a select group of full-time drivers.

Default&contextData=(sc.Default)&firstPage=true; Interview with Dexter, *supra* note 283.

287. Religious activists seeking to improve conditions and wages for maquiladoras in Mexico mounted a shareholder campaign in 2001. The Center for Interfaith Corporate Responsibility released a study documenting the widening gap between maquiladora wages and the cost of living in fifteen Mexican cities. Joel Millman, *Shareholders Asked to Pressure U.S. Firms to Increase Salaries of Workers in Mexico*, WALL ST. J. (June 28, 2001), https://www.wsj.com/articles/SB993685178197617030. *See also* Harry J. Van Buren III, *An Insider View of Outsider Influence: Legitimacy and Shareholder Activism*, 7 PROCS. INT'L ASS'N BUS. & SOC'Y 315 (1996), https://www.pdcnet.org/iabsproc/content/iabsproc_1996_0007_0315_0326 (paper presented at the seventh annual meeting); Victoria Carty, *Transnational Labor Mobilizing in Two Mexican Maquiladoras: The Struggle for Democratic Globalization*, 9 MOBILIZATION: AN INT'L Q. 295, 300 (2004) (reporting the increase in wages and improvement in working conditions for two maquiladoras).

288. Henry Hansmann, *When Does Worker Ownership Work?* 99 YALE L.J. 1751, 1780-83 (1990).

289. Ananya Battacharya, *Apple Extends Stock Grants to All Employees*, CNN BUS. (Oct. 15, 2015), https://money.cnn.com/2015/10/15/technology/apple-stocks-free-for-all-employees/index.html.

More than 1.1 million drivers were eligible for a payout of $100, $500, $1,000, or $10,000 (totaling about $300 million). Drivers in good standing who had completed 2,500, 5,000, 10,000, or 20,000 lifetime trips as an Uber driver would receive the corresponding cash reward. Full-time drivers were also permitted to buy Uber stock at the IPO price with their cash award.[290] Lyft's program was less generous: Lyft gave $1,000 to drivers with at least 10,000 rides and 20,000 rides earned Lyft drivers $10,000. Drivers on Lyft's unique Driver Advisory Council were also rewarded up to $1,000, and certain drivers could buy IPO stock.[291] Ironically, ridehails were not able to give stock outright to their drivers because they were not classified as employees.

In all of these cases, the company had already begun to enjoy dramatic commercial success (even if the ridehails have yet to make a profit). But worker equity funds might have been less useful back in the 80s for the immigrant women who wired circuit boards or for the workers who drove for Uber and Lyft at the beginning. In addition, worker funds frequently face the problem that fund representatives are focused on maximizing the value of worker equity, frequently at the expense of the workers themselves.[292]

Another option that might sidestep some of these governance and maturity issues associated with worker equity funds involves requiring firms to issue workers a differentiated class of share offerings that gives workers a voice on worker issues. State law allows firms to adopt a wide variety of voting regimes. Firms have differentiated voting rights among several classes of shares and have created classes without votes at all or with multiple votes on particular issues.[293] More and more, shareholder voting rules have given shareholders a significant voice on important matters submitted for shareholder voting.

Accordingly, start-up firms could be required to create a particular class of share with voting rights on worker issues and perhaps some special voting/veto power over issues relating to wages and working conditions. Shares could be offered as additional compensation to top up below-market salaries. These shares could also be distributed through a worker co-op and trust mechanism as described above, to keep shares in-house.

290. Uber Technologies, Inc., IPO disclosure (Form S-1) (Apr. 11, 2019), https://www.sec.gov/Archives/edgar/data/1543151/000119312519103850/d647752ds1.htm.

291. Lyft, Inc., IPO disclosure (Form S-1) (Mar. 1, 2019), https://www.sec.gov/Archives/edgar/data/1759509/000119312519059849/d633517ds1.htm.

292. Naidu & Posner, *supra* note 26, at 25.

293. Lawrence A. Cunningham, *The Case for Empowering Quality Shareholders*, 46(1) BYU L. REV. 101, 161 (2022).

Although equity is one way to give workers a voice and a share in the profits, the voice that equity offers can actually be separated from stock. That is, even without the issuance of stock, firms could be required to offer workers a vote on wage and other worker issues through representative work councils. This happens in several European countries that use "codetermination" between management and workers to make collective decisions.[294] Although the United States would need to restructure corporate governance substantially in order to enable co-determination, the point that voice can be separated from equity is useful in thinking creatively about remedies that lift worker voices.[295] Candidates like Bernie Sanders and Elizabeth Warren proposed various forms of co-determination (like the Accountable Capitalism Act) on their campaign trails.[296]

F. *State Mandates*

Of course, firms are not likely to voluntarily pay their wage subsidy taxes, adopt worker equity funds, distribute dual class share offerings, or sign on to work council co-determination. This Paper argues in favor of an approach that appears to be a carrot but also involves a big stick. To incentivize participation in firm-level worker-focused institutions, government should tie participation to the receipt of the kind of government assistance that start-ups almost always apply for—grants, small-business loans, and all sorts of other public-private partnerships that have encouraged the development of digital technology.

Innovation scholars have recently pointed out that many of the digital economy's most successful ventures have relied heavily on government funding and government collaboration in technological development.[297] Tech firms often apply for small business loans or seed money

294. *Id. See also* Simon Jäger, Shakked Noy & Benjamin Schoefer, *What Does Co-Determination Do?* (Nat'l Bureau of Econ. Rsch., Working Paper No. 28921, 2021), https://www.nber.org/system/files/working_papers/w28921/w28921.pdf. Scholars have been critical of co-determination as it has operated in practice, particularly with regard to Germany. Gary Gorton & Frank Schmid, *Capitol, Labor and the Firm: A Study of German Co-Determination*, 2 J. EUR. ECON. ASSOC. 263 (2004).

295. *See generally* Leo E. Strine, Aneil Kovvali & Oluwatomi O. Williams, *Lifting Labor's Voice: A Principled Path Toward Greater Worker Voice and Power Within American Corporate Governance*, 106 MINN. L. REV. 1325 (2022) (proposing a broad set of reforms that promote worker voice via co-determination style structures.).

296. *See, e.g.*, Ryan Boyd, *Codetermination: Elizabeth Warren's Simple Plan to Transform Capitalism*, NW. BUS. REV. (2019).

297. *See* MARIANA MAZZUCATO, THE ENTREPRENEURIAL STATE: DEBUNKING PUBLIC AND PRIVATE MYTHS (2015) (arguing that, in contrast to conventional notions about

from the Small Business Innovation Research and Small Business Technology Transfer programs from the federal Small Business Administration, a federal agency created in 1953. All digital economy startups who use the Internet have benefited from technological breakthroughs that were the result of public-private partnerships among the Defense Advanced Research Projects Agency (DARPA), AT&T Bell Labs, Xerox PARC, Shockley, and Fairchild, to list just a few.[298]

More specifically, the firms discussed in the case studies above all relied on government assistance in their earliest stages and would have been subject to the kind of leverage described here. For example, before going public in 1980, Apple secured $500,000 as an early-stage equity investment from Continental Illinois Venture Corp. (CIVC), a Small Business Investment Company (SBIC) licensed by the SBA to invest in small firms.[299] Under the proposed approach, given the firm's reliance on undocumented immigrant women, Apple would have been required to adopt worker equity funds, work councils, or other worker-voice focused programs as a pre-requisite to receiving government assistance.

Most high-tech firms and start-ups have some form of profit-sharing with voting rights that they make available to higher-level employees.[300] These higher-level employees, who are disproportionately white, are more likely to be paid the marginal revenue product of their labor, if not more. This Paper argues that we should treat essential workers of color and immigrant workers at the bottom of the ladder as we treat those at the top. They should be paid the wages they would earn if they had the same kind of outside options as do other workers. Equity compensation should be extended to them, not just white employees. The myth of the lone digital platform innovator as a private actor is belied by the fact that platform innovators and digital entrepreneurs frequently rely on both the government for public funding and on racially exploited workers to cut costs and be able to blitzscale their innovations to success.

Startup firms who want to take advantage of public funding or public-private partnerships (but really all startup firms) should be forced to properly value the essential contributions of workers of color at the bottom. Scholars who think of corporations as having public responsibility might argue more aggressively that contributing to a tax-and-transfer fund or providing worker equity should be a prerequisite to receive the benefits of incorporating, like limited liability, corporate personhood, and

what is public and what is private, most entrepreneurs have relied on public funding at key moments in their innovations.).

298. *Id*. at 101.

299. *Id*. at 100-01.

300. *See* JOSEPH R. BLASI, RICHARD FREEMAN & DOUGLAS KRUSE, THE CITIZEN'S SHARE: PUTTING OWNERSHIP BACK INTO DEMOCRACY (2013).

many other benefits federal and state governments confer on corporations when incorporating.

VI. CONCLUSION

Racial exploitation is not just for early-stage innovations. Some of today's more mature digital firms continue to rely on racial exploitation strategies similar to those that firms used to launch the innovations and engineer early-stage blitzscale growth. Apple continues to racially exploit workers for circuit boards, though it has shifted almost all board assembly to overseas workers in India (who work for a Taiwanese vendor) for the new iPhone.[301] Uber and Lyft have become increasingly dependent on drivers of color to drive full-time and hold the driving network together.[302] Artificial intelligence has increased the expendability of digital workers who label data; these workers are now managed, hired, and fired by way of algorithm rather than human managers.[303]

Economist Suresh Naidu writes of the "powerlessness of forced labor," to describe the lack of meaningful choice that exploited workers have given their limited outside options.[304] This Paper has argued that some of our country's most celebrated digital innovations have relied on forced labor. Long after the end of slavery, workers of color are still not free. Racially exploited workers—the immigrant women who worked for Apple, the Black and Latine drivers who work for Uber, and the Indian ghost workers who labeled ImageNet data—all lacked power, not because they were enslaved or indentured by law, but because they had few outside options, owing to discrimination and structural issues with their job search networks and access to education and training.

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301. Ben Lovejoy, *Wistron iPhone production in India will include printed circuit board assembly*, 9TO5 MAC (Feb. 3, 2020), https://9to5mac.com/2020/02/03/iphone-production-in-india/.

302. PARROT & REICH, *supra* note 4, at 23; Tyler Sonnemaker, *Uber and Lyft Say the Battle over AB-5 is About Preserving Flexibility for Part-time Gig Workers. The Reality is Their Businesses have become Dependent on Full-time Drivers and they Can't Afford to Pay Them Like Employees*, BUSINESS INSIDER (Aug. 21, 2020), https://www.businessinsider.com/uber-lyft-ab5-fight-reveals-dependence-full-time-drivers-2020-8.

303. Mary L. Gray, Siddharth Suri, Syed S. Ali & Deepti Kulkarni, *The Crowd is a Collaborative Network*, CSCW '16: PROCEEDINGS OF THE 19TH ACM CONFERENCE ON COMPUTER-SUPPORTED COOPERATIVE WORK & SOCIAL COMPUTING 134 (2016), https://dl.acm.org/doi/10.1145/2818048.2819942.

304. Suresh Naidu, *Essential Workers' Are Just Forced Laborers*, WASH. POST (May 21, 2020), https://www.washingtonpost.com/outlook/2020/05/21/essential-workers-pay-wages-safety-unemployment/.

The Covid-19 pandemic has only highlighted the vulnerability of racially exploited workers.[305] Uber and Lyft drivers had no meaningful choice about whether to risk their health and drive. Rebecca and Cristina are a Latina couple in Los Angeles who had worked in craft service for the entertainment industry before the pandemic, supplementing their income with a day or two of driving for Uber and Lyft. At the beginning of the pandemic, all craft service jobs came to a halt as the industry shut down completely.[306] Rebecca and Cristina had no meaningful choice about whether to risk their health: Rebecca turned to driving full-time to be able to pay their bills, worrying as each passenger entered and exited about whether she would have to stop because of infection.[307] Even as other workers are exiting the workplace, many of them are turning to gig work to pave the transition to their next high-wage job; workers of color are far less likely to have that kind of choice.

This Paper proposes that racially exploited workers be paid the value of their labor. As innovators in the digital economy rake in profits and amass billions in personal wealth, fairness dictates that the workers who soldered the Mac circuit boards, who drove the early Uber and Lyft fleets full time, who labeled the hundreds of thousands of images that would enable computers to recognize objects be compensated for their central and essential contributions, at the very least with the competitive market value of their wages, and a share in the profit from their work.

Moreover, as valued contributors to some of the most high-profile innovations in the digital economy, workers should have some choice—choice about whether to earn the full value of their labor at the time they work or earn deferred compensation via stock or cash. Fairness dictates that the workers of color who enable innovators to enjoy great wealth and commercial success at the very least be paid the value of their labor. In addition, as workers essential to the innovation, it seems only fair these workers should share in the profits. In addition to their labor, they have invested their foregone wages and the uncertain risk of their economic precarity, all to create the kind of workforce—low cost, easy to scale, and quick to hire and fire—that enabled Apple, Uber, and ImageNet to get where they are today.

305. Patrick McGeehan, *They Risked Their Lives During Covid. They Still Don't Earn Minimum Wage*, N.Y. TIMES (July 20, 2021), https://www.nytimes.com/2021/07/15/nyregion/nyc-gig-workers-pay.html.

306. Interview with Rebecca Bracamontes & Cristina Gonzales, Los Angeles Uber/Lyft drivers (Nov. 17, 2020).

307. *Id.*