

# ISSUES

IN SCIENCE AND TECHNOLOGY

NATIONAL ACADEMIES OF SCIENCES,  
ENGINEERING, AND MEDICINE  
THE UNIVERSITY OF TEXAS AT DALLAS  
ARIZONA STATE UNIVERSITY  
SPRING 2016

## Summit on Human Gene Editing

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Daniel J. Kevles,  
Ruha Benjamin

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# The Rise of the Platform Economy

The application of big data, new algorithms, and cloud computing will change the nature of work and the structure of the economy. But the exact nature of that change will be determined by the social, political, and business choices we make.

**A** digital platform economy is emerging. Companies such as Amazon, Etsy, Facebook, Google, Salesforce, and Uber are creating online structures that enable a wide range of human activities. This opens the way for radical changes in how we work, socialize, create value in the economy, and compete for the resulting profits. Their effects are distinct and identifiable, though certainly not the only part of the rapidly reorganizing global economy. As the work by Michael Cusumano, Annabelle Gawer, and Peter Evans has shown, these digital platforms are multisided digital frameworks that shape the terms on which participants interact with one another. The initial powerful information technology (IT) transformation of services emerged with the Internet and was, in part, a strategy response to intense price-based competition among producers of relatively similar products. IT-enabled services transformation, as our colleagues Stuart Feldman, Kenji Kushida, Jonathan Murray, and Niels Christian Nielsen have argued in other venues, was based on the application of an array of computable algorithms to myriad activities, from consumption and leisure

to services and manufacturing. The movement of these algorithms to the cloud, where they can be easily accessed, created the infrastructure on which, and out of which, entire platform-based markets and ecosystems operate. Platforms and the cloud, an essential part of what has been called the “third globalization,” reconfigure globalization itself.

These digital platforms are diverse in function and structure. Google and Facebook are digital platforms that offer search and social media, but they also provide an infrastructure on which other platforms are built. Amazon is a marketplace, as are Etsy and eBay. Amazon Web Services provides infrastructure and tools with which others can build yet more platforms. Airbnb and Uber use these newly available cloud tools to force deep changes in a variety of incumbent businesses. Together they are provoking reorganization of a wide variety of markets, work arrangements, and ultimately value creation and capture.

This digitally based new economy has been given a variety of names derived from some of its perceived attributes. How we label this transfor-

mation matters because the labels influence how we study, use, and regulate these digital platforms. Its boosters have called it the Creative Economy or the Sharing Economy, whereas those less convinced of its beneficence have dubbed it the Gig Economy, the Precariat, or the 1099 Economy, focusing on its impact on workers and how they are compensated. And there are wide variations within these labels. Consider the Shared Economy. Examples include Uber and Airbnb, which are very distant from the visions of Wikipedia, with its communal construction of knowledge; from Napster, which shared music regardless of whether it was legal; or from open source software creations such as Linux and Apache. Despite the attractive label and the entrepreneurial successes, Uber, Airbnb, and Facebook are not based on “sharing”; rather, they monetize human effort and consumer assets. Indeed, the advantage of platform-based companies often rests on an arbitrage between the practices adopted by platform firms and the rules by which established companies operate, which are intended to protect customers, communities, workers, and markets. Lyft and Airbnb are entrepreneurial initiatives that facilitate the conversion of consumption goods such as automobiles and apartments into goods that are monetized. This “sharing” has a more than passing resemblance to the putting-out economy that existed before factories, when companies would ship materials to people to assemble items such as shoes, clothing, or firearms in their homes. In the current manifestation of putting out, the platform operator has unprecedented control over the compensation for and organization of work, while still claiming to be only an intermediary. On the other hand, the rapidly growing mobile phone app stores and user-generated content platforms such as YouTube and Instagram are structured as digital consignment industries, borrowing from the way artists sell their work through galleries.

We prefer the term “platform economy,” or “digital platform economy,” a more neutral term that encompasses a growing number of digitally enabled activities in business, politics, and social interaction. If the industrial revolution was organized around the factory, today’s changes are organized around these digital platforms, loosely defined. Indeed, we are in the midst of a reorganization of our economy in which the platform owners are seemingly developing power that may be even more formidable than was that of the factory owners in the early industrial revolution. The proliferation of labels is simply a reflection of the recognition that platforms are

## **We are in the midst of a reorganization of our economy in which the platform owners are seemingly developing power that may be even more formidable than was that of the factory owners in the early industrial revolution.**

already having powerful consequences for society, markets, and firms, and that we are unclear about their dynamics and directions. Whatever we call the transformation, the consequences are dramatic.

### **Utopia or dystopia**

The debate about the impact of the platform economy is an extension of a discussion that began in the early days of the IT revolution, when figures such as Robert Noyce, Bill Gates, and Steve Jobs claimed that they were creating a future that would open the world to new possibilities and prospects. Optimists still abound, and San Francisco is now experiencing what may be its biggest gold rush yet, with investors, entrepreneurs, and data scientists working furiously to create “disruptive” new businesses. For investors, inherently optimists, the question is how to build platforms, attract users, and then capture the value that is generated from the emerging ecosystem. Regardless of the platform, all of them are based on mobilizing human beings to contribute. Whether it is Google monetizing our searches, Facebook monetizing our social networks, LinkedIn monetizing our professional networks, or Uber monetizing our cars, they all depend on the digitization of value-creating human activities.

The optimistic version of the emerging techno-economic system suggests that society can be reconstituted with producers becoming proto-entrepreneurs able to work on flexible schedules and benefit from these platforms. And this certainly will be the case for many. Similarly, the utopians argue that platforms, such as the car-sharing services Uber and Lyft, can unlock the commercial value in underused personal assets; other platforms, such as Airbnb, promote the notion that vacant rooms in one’s house or apartment can become sources of income whether technically hotel rooms or not. Advocates believe that all of this can occur for the greater social good without negative consequences. But can we really foresee all the repercussions of

these new economic arrangements? For example, platform businesses matching workers and tasks may make labor markets more efficient, but if they become pervasive and organize a significant portion of the work, they are at the same time likely to generate fragmented work schedules and increasing levels of part-time work without the employment-related benefits that previously characterized much employer-based full-time work. For now, it is not clear whether these digital platforms are simply introducing digital intermediaries or actually increasing the extent of gig or contract work.

Even as the digital era unfolded in its utopian phase in the 1970s, there were skeptics who feared that the new technologies would result in unanticipated and undesirable consequences. Perhaps most prescient was Kurt Vonnegut's 1952 novel *Player Piano*, which even gave a bit part to the great mathematician Norbert Wiener. Vonnegut envisioned a digital future of material abundance—albeit a digital future of machines built with tubes, not semiconductors—with a radical social division between a highly credentialed and creatively employed elite and an underclass. His dystopian vision is now finding full expression in the fear that digital machines, artificial intelligence, robots, and the like will displace work for a vast swath of the population. Bill Davidow, once at Intel and then at his own Silicon Valley venture capital firm, expressed this in his *Harvard Business Review* article “What Happens to Society When Robots Replace Workers?” The MIT economists Erik Brynjolfsson and Andrew McAfee explore this trend in more detail in their book *The Second Machine Age*.

The impact on employment and the character of work is certainly one element in assessing whether we will have a utopia or dystopia. In our view, that outcome is yet to be determined. As a society we will have to make choices about how to deploy new technologies, choices that will be critical in shaping the ultimate impact. The questions are really: what balance will there be among jobs created as the digital wave flows through our economy and society, and which workers will be displaced? Certainly it is feasible to catalogue existing work, particularly work that is routine, as likely to be replaced or reconfigured by digital tools, and perhaps, as some have tried, to estimate the numbers of such existing jobs that will be digitized away. By contrast, the new kinds of work that are now being created and the existing jobs that will be redefined and reorganized in the future are more difficult to forecast, so we can only speculate. Algorithms and databases are automating

some kinds of work, but even as this occurs other value-creating opportunities are appearing. There will be new products and services as well as new production and service processes, which are likely to be design and creativity intensive, as well as algorithm-enabled. Some of the early indicators of the new or transformed work can be enumerated, but certainly not exhaustively counted.

Moreover, existing jobs will be redefined and reorganized in the future. The character of some existing work—how much or how little, we cannot know—will be reframed but not eliminated by digital technology. Uber, Airbnb, TaskRabbit, Handy, and other platform firms are transforming industries by connecting “producers” with customers in new ways. In some cases, this is displacing or threatening existing, often regulated, service providers, such as taxis and hotels. In other cases, it is formalizing previously less organized or locally organized work. Still other platforms, such as app stores and YouTube, are creating entirely new value-creating activities that are formalizing into what can be seen as precarious careers, such as a YouTube producer or smartphone app developer. Finally, existing organizations are creating new digital and social media marketing departments and jobs. The question in these cases is what system of control and value capture will be in place. Our sense is not necessarily that there will be less work, but that for a growing number of jobs, the relationship with an employer will be more tenuous than ever. These changes are not likely to result in the workerless society. One possibility is a society in which the preponderance of the work and value creation is more dispersed than ever before, even as the platform owners centralize the transactions and capture their value.

Indeed, we may, unless policy rules lock in the position of the emerging incumbent, see another round of innovation and job creation. The use of digital automation presents a classic dilemma: anything that can be characterized sufficiently to become computable can be copied, as our colleague Niels Christian Nielsen has argued elsewhere. At that point, another round of innovation and imagination will be required. Can automation innovate itself? More likely, teams of people and digital tools working together will be required to be competitive. The Turing test might be able to establish that a digital machine can imitate intelligence, but the test does not establish consciousness or consider whether human consciousness in all its diversity differs in fundamental ways from current algorithmic tools.

The debate over jobs created or destroyed is useful

and worth continuing, but we should be clear that it has no end, and there will be no definitive answer. For now, there are only indicators and traces to suggest an outcome. And that outcome, we emphasize and repeat, will be shaped by choices about technology deployment that turn on entrepreneurial initiative, corporate strategies, and public policies. As in the discussion of what is being called the Internet of Things or the digitally based reorganization of manufacturing, in our research with colleagues at the Research Institute for the Finnish Economy, we find significant differences among national emphasis and investments. German policy is directed toward maintaining its competitive position in manufacturing built on a base of skills and with a fabric of small and mid-sized companies even as the foundations of production evolve. The U.S. emphasis seems to be on developing and applying high-end sophisticated tooling for aerospace and military applications. On the consumer side, some communities have simply banned Uber and Lyft, whereas others welcomed it. Which communities, this leads us to ask, are most likely to be the sources and beneficiaries of the emerging platform economy? Which are most likely to be discomfited?

Although technologies may not dictate our future, they frame the choices to be made and the questions to be answered. Will the platform economy, and the reorganization it portends, catalyze economic growth and a surge in productivity driven by a new generation of entrepreneurs? Or will the algorithmically driven reorganization concentrate substantially all of the gains in the hands of those who build the platforms? Will it spark a wave of entrepreneurial possibilities, unleash unimagined creativity, free workers from oppressive work schedules, or unleash an avalanche of dispossessed workers who are trying to make a living with gigs and temporary contracts? If we do not interrogate these technological trajectories, we risk becoming unwitting victims of their outcomes. What questions should we be asking?

### **The key technologies**

The algorithmic revolution and cloud computing are the foundations of the platform economy. But computing power is only the beginning of the story. That computing power is converted into economic tools using algorithms operating on the raw material of data. The software layer that stretches across and is interwoven with the economy is a fabric of algorithms. That software

layer, that algorithmic fabric, is being extended to cover manufacturing, giving birth to the Internet of Things, the Internet of Everything, or the Industrial Internet, with its implied webs of sensor networks. It is no exaggeration to say that software was formerly embedded in things, but now things—services as well as physical objects—are woven into software-based network fabrics. This software layer extends the availability and lowers the cost of access to digital tools and traditional tools accessed by and controlled by digital processes. Moreover, costs drop through the use of open-source software, cloud storage and computing, and physical spaces such as those provided by TechShops that enable individuals to work with advanced industrial-scale equipment. Among other consequences, this certainly lowers the cost of entry for newcomers.

Cloud computing rests on the virtualization and abstraction of computing processes. One of us (Zysman) has examined the character, emergence, and deployment of cloud computing in work with Jonathan Murray, Kenji Kushida, Patrick Scaglia, and Rick McGeer. Although the details of how it works do not matter for this essay, the consequences do. For the providers of cloud services, scale matters enormously. For users—individuals, small- and mid-size enterprises, startups, and corporations—the consequence is a radical reduction in the cost of computing resources and information and communication technology tools, a radical reduction in barriers to usage. Users can rent resources as they require them rather than having to own or build entire computing systems. Computing and the applications and platforms it facilitates are now available as an operating expense rather than a capital expense.

Digital platforms are complicated mixtures of software, hardware, operations, and networks. The key aspect is that they provide a set of shared techniques, technologies, and interfaces to a broad set of users who can build what they want on a stable substrate. Android and IOS are platforms. Although they somewhat restrict the applications that one can build or sell, they are, in general, open to app builders. Android is also a platform for hardware (handset and other device makers) because the code is open, not just the interfaces. Indeed, platforms can grow on platforms. Many of the current Internet platform firms use Amazon Web Services. Many of these platforms attract a myriad of other contributors that, when sufficiently rich, can result in the formation of an ecosystem. For example, in the case of the apps stores, complementary businesses are emerging. AppAnnie is a firm that ranks the revenue generated

by apps; there are advertising agencies that analyze YouTube ad buying; TubeMogul classifies YouTube “stars” and measures their reach; and there has been a proliferation of agencies that cultivate new YouTubers. These “complementors” are powerful allies in building and maintaining the lock-in for the master platform. Of course, building a platform is work, but platforms themselves then generate or organize the work of others by providing the digital locations for the connections that organize work and other activities.

A looser definition of a platform, as noted previously, is one in which social and economic interactions are mediated online, often by apps. For example, Uber, so far as we know, does not yet provide a platform upon which others can establish businesses, such as organizing a pizza delivery fleet. Nevertheless, as an algorithmic structure providing a digital market and potentially an ecosystem, albeit one it controls, Uber should be considered as a firm operating a platform.

Digital platforms facilitated by key technologies such as the cloud, including digital marketplaces such as Amazon and Internet firms such as Google and Facebook, are restructuring ever more parts of the economy. The discussion is complicated because, as noted, there is not yet a clear definition of digital platforms that allows us to specify precisely what is in and out of the category. The term “platform” simply points to a set of online digital arrangements whose algorithms serve to organize and structure economic and social activity. In the IT world, the term means a set of shared techniques, technologies, and interfaces that are open to a broad set of users who can build what they want on a stable substrate. As used more widely, and by us in this essay, the term also points to a set of digital frameworks for social and marketplace interactions.

Speculations aside, while there is a rich and emerging literature, at the moment there is no real theory of the effect of these diverse platforms on the overall economy. To sense the scope of the market and regulatory impact of the loosely labeled platform economy, let us consider some of the most salient types of digital platforms.

- **Platforms for platforms.** In a sense, the Internet itself is the foundational platform, with Google as its cataloger. As we have shown with Bryan Pon and Timo Seppala, Apple’s iOS and Google’s Android are smartphone operating system platforms on which massive ecosystems have been built. In addition, there are businesses that

provide infrastructure and tools for the rest. For example, Amazon Web Services, Microsoft’s Azure, and Google Cloud Platform facilitate the construction of cloud services, the tools with which other platforms are built. In a sense, as Stuart Feldman remarks, “it is platforms all the way down.”

- **Platforms that make digital tools available online and support the creation of other platforms and market places.** GitHub, for example, is becoming the repository of open source software programs of all kinds. This dramatically reduces the cost of software tools and building blocks. Moreover, tools and software, such as sales support, human resources, and accounting, which previously were sold or leased by companies such as Oracle and ADP, are now available in the cloud from companies such as Zenefits, Job Rooster, and Wonolo. Zenefits offers an online marketplace of human resource tools free to small businesses and is thus disintermediating the local benefits insurance broker. Zenefits makes its money from commissions from the firms seeking to provide insurance to the small businesses using its service. Were Zenefits to become the dominant platform in the field of providing professional-grade, back-office tools to small businesses, the sheer amount of business data it would have to analyze would allow it to create yet other services. As a side effect, Zenefits, as it now acknowledges and is taking steps to correct, threatened the regulatory role of state insurance commissions. Finally, with the lock-in it could achieve, it will be able to alter the terms of service provision through its code, thereby providing it with enormous potential power.
- **Platforms mediating work.** Platforms mediate work in a variety of ways. Some platforms transform the work of previously independent professionals. For example, LinkedIn treads on the domain of headhunters and empowers the human resources department by selling access to the information freely provided by members. Other platforms such as Amazon Mechanical Turk, which enables companies to crowdsource the performance of specific tasks that require human judgment, is a modern form of the putting-out system. Other websites such as UpWork and Innocentives have created similar global virtual-labor exchanges. Importantly, it is uncertain whether these platforms will change the number of contract or gig workers; or only change the

mechanisms of intermediation and the operation of the labor market.

- **Retail platforms.** Certainly, the most widely recognized online platforms—ones that have made the notion of a platform economy widely discussed—are Amazon, eBay, and Etsy, along with a host of others.
- **Service-providing platforms.** Airbnb and Lyft are the classic examples. There is also an endless array of financial platforms, from sites for project funding, such as Kickstarter or Indiegogo, to platforms that intend to displace traditional financial institutions, such as AngelsList for venture capital and Zopa and Rate Setter for peer-to-peer lending. Transfergo and Transferwise are building platforms to simplify global money transfers.

In all these examples, across all the categories, the algorithmic underpinnings of the online activity are most evident. For example, Lyft connects drivers with customers algorithmically. The algorithms integrate mapping software, real-time road conditions, and the availability of drivers to provide a price estimate. Drivers are vetted through online checks, which, of course, work only as well as the data they have. Payment is made by credit card information that is on file.

### **Economic consequences**

What we do know is that these platforms are in many cases disrupting the existing organization of economic activity by resetting entry barriers, changing the logic of value creation and value capture, playing regulatory arbitrage, repackaging work, or repositioning power in the economic system. As a starting place for discussion, we might ask the following questions about each platform or type of platform.

**How is value created?** The platform economy comprises a distinctly new set of economic relations that depend on the Internet, computation, and data. The ecosystem created by each platform is a source of value and sets the terms by which users can participate.

**Who captures the value?** Indeed, what is the distribution of risks and rewards for the platform users? There are a variety of mechanisms with various implications for gains distribution. Some platforms allow the owner to “tax” all transactions, whereas others monetize their services through advertising. Platforms can transform work previously done by traditional employees into tasks performed

by contractors, consigners, or quid pro quo workers—or create entirely new categories of work. There are also what Gina Neff calls “venture laborers,” that is, the people who work at the platform firms. They receive high wages, and if the firm is successful, the value of the platform is capitalized in the stock market, resulting in remarkable amounts of wealth for the firm’s direct employees and entrepreneurs. If the firm falters or fails, these individuals must find new employment.

There is also a growing cohort of what some call “mini-entrepreneurs” and others call “consignment workers,” who provide goods—usually but not necessarily “virtually”—for platforms such as app stores, YouTube, or Amazon Self-Publishing. Although the vast majority of them are unsuccessful or marginally profitable, some can be enormously successful, and despite the fact that this phenomenon is as yet unmeasured, it is clearly creating many new opportunities for entrepreneurship. In certain cases, particularly in apps, those in the consignment economy sometimes grow so large that venture capitalists will invest in the entrepreneur/firm, and the employees become venture labor. Some of these apps can become platforms themselves. Put differently, the consignment model has significant upside for participants, but it is accompanied by high risk.

**Who owns or controls the platform?** The answer varies by platform, and the differences are important. The distribution of benefits differs considerably, for example, at these platforms: Wikipedia, where the network is managed by a consensus set of rules; the Danish Agricultural Cooperative platform, in which participant owners know one another and there are clear boundaries between inside owners and others; and Uber, in which the platform is owned by a small group of entrepreneurs and their venture capitalists and where the value will eventually be capitalized by the sale of a controlling interest through either acquisition or a stock offering.

**How is work packaged and value created, and what percentage of work is now organized in these radically new ways?** What happens to the organizational forms of work? Certainly, some workers, such as those employed by Microsoft, Google, LinkedIn, and Facebook, retain traditional employment relationships. Although these firms expect long working hours, they also provide considerable scheduling flexibility as well as a variety of free food, drinks, transportation, and other benefits that can make them appear to be corporate paradises. By comparison, those who obtain work as gigs, consignments, or contracts through digital platforms

## Are we generating labor market flexibility, or a precariat that resembles a cyberized Downton Abbey replete with a small elite and a new and sizable underclass?

have radically different experiences. Although they have control of their work hours, they rarely receive any other employee benefits. Conceptually, if not literally, Uber converts taxi company employees or former medallion owners into contractors, whose access to income is through the Uber platform, while removing government from the rate-setting equation. Are these contractors mini-entrepreneurs, employees in all but name, or yet something else? Further, what is the proper employment category for individuals who hope to be one of the winners by producing apps, YouTube videos, or self-published books on Amazon? In these activities, there is a power law of returns by which a few big winners are remunerated by advertising, product placement payments, personal appearance fees, and even crowd-funding campaigns, while a very long tail of producers are creating the vast bulk of consigned content without monetary return.

Many are now concerned that rather than creating a new source of productivity we are legitimating a new form of putting out. Can Uber drivers be self-supporting contractors in a 1099 economy rather than stable workers in an employment economy, or are they just extremely vulnerable gig workers? And, more broadly, as Ruth Collier asks, what will be the consequences for mass politics and political structures? Are we generating labor market flexibility, or a precariat that resembles a cyberized Downton Abbey replete with a small elite composed of the platform owners and a new and sizable underclass?

### Making choices

What sort of an economy and society will we create in the transition to digital platforms and the accompanying reorganization of significant portions of the global economy? And importantly, what choices will we have?

Before we turn to the long list of issues, with each issue opening an array of questions and debates, two points need to be made. First, Larry Lessig famously

claimed that code is law; that is, code represents binding restrictions on behavior. Algorithms and platforms structure and constrain behavior; the law in the books is often difficult to apply or enforce in the digital world where action is possible only if it conforms to frameworks expressed in the code that shapes and directs behavior. Consider the fight between the Justice Department and Apple; the warrant has no meaning if it cannot be executed in code; for the warrant to be implemented, the code would have to be modified.

Platform entrepreneurs increasingly believe that if they possess a first-mover advantage, they can, in fact, remake existing law by creating new practices on their platforms that essentially establish new norms of behavior. It is often said in Silicon Valley, “Don’t ask permission; ask forgiveness,” as, perhaps, was the case with Volkswagen’s “fix” for “clean” diesel engines. Of course, this forces two sets of questions. First, who writes the code, and whose values are expressed in code? The code writers, taking Uber as an example, have already reshaped social behavior. Government rules will influence how the new technologies are deployed and their consequences, but in a platform economy, government decisions may be constrained by the “facts” in the software.

Second, although public policies are obviously important, corporate strategies also have far-reaching effects. Do companies view workers only as costs to be contained or as assets—even in an era of algorithms, data, and robots—to be developed and promoted? And equally important, are those assets directly tied to the firm? Who should bear the costs of their retention and upgrading?

Acknowledging the constraints of code and the centrality of company choice in shaping outcomes, our platform future, the character of market, and the social logic established will depend on an array of policy choices. What market and social rules are appropriate for a platform economy and society?

Our old labels and categories, not just old rules, are being thrown into disarray. To begin sorting this out, let us start with the firm. In the late nineteenth century, the corporation emerged as a means of orchestrating economic activity and organizing markets. In the twenty-first century, we speculate that these functions will be taken on by the platform in the cloud. Take Google, the platform economy giant, which, despite its 2014 revenues of \$66 billion, has only 50,000 employees. Uber has only about 1,500 employees and is already a global business. What policy and political issues arise when the orchestrators of economic activity are relatively



small firms, rather than organizations as large as Ford Motor Company, General Electric, or General Motors—all of whom also require sophisticated supplier and distribution networks?

It is evident that platforms open up many entrepreneurial opportunities. Some entrepreneurs, such as Robin Chase at Zipcar, envisioned an alternative social, not just economic, model because digitally enabled car sharing could dramatically reduce the incentive to own a car. If that model spread widely, it might result in a drop in overall demand for auto production. This may or may not disrupt Hertz (Zipcar was sold to Avis), but it might dramatically affect automakers. Indeed, automakers responded by developing partnerships with Uber and Lyft. In other words, such “sharing” solutions could have unforeseen ripple effects on entire market ecosystems, as encyclopedia and book publishers are discovering to their dismay.

But many platforms by their very nature prove to be winner-take-all markets, in which only one or two companies survive, and the platform owner is able to appropriate a generous portion of the entire value created by all the users on the platform. More important, however, is that as the power is centralized, the platform owner can become a virtual monopolist. In that case, the platform owner can squeeze the platform community—the drivers or customers on Lyft or Uber, the content providers, the consigners, the customers, essentially any of the participants in the ecosystem who are instrumental in creating the value in the first place. Perhaps competition among platforms in a similar domain, Uber and Lyft for example, might mute the consequences of the power inside the platform. In any case, a monopoly position or even a strong oligopoly might inhibit, or sharply constrain, further entrepreneurial efforts.

Indeed, the appropriate market rules for competition/antitrust, labor market, and intellectual property among many others are becoming increasingly difficult to specify and legislate. Policy and political interests among the players, even among the winners, are far from uniform. Consider such domains as antitrust policy, where the European Commission has done battle with U.S. tech companies; intellectual property, where the interests among information and communications technology firms and platform firms are less consistent than it might seem at first glance; network policy, where carriers such as AT&T have radically different interests from Netflix or Google; and labor market policies. Indeed, the wireless carriers have

announced they will start blocking advertisements on smartphones, thereby directly attacking the Google and Facebook business models. As we have shown with Bryan Pon, the turbulent environment in the smartphone ecosystem is leading to complex competitive strategies that have technical, social, and political ramifications.

The question of outcomes goes beyond the question of whether digital platforms spawn entrepreneurs or monopolists. We need to ask whether a society organized around platform owners servicing mini-entrepreneurs, contractors, and gig workers portends an even more unequal society. Does the answer depend on the character of platforms or on the policies and politics of the platform economy?

The issues of entrepreneurship and those of work organization that we discussed earlier are tightly interwoven. The policies that we adopt now might determine the balances achieved later. If we want an entrepreneurial spirit to infuse the platform world, then we want risk-taking entrepreneurs, whether they are forming the platforms or seeking advantage as contractors or consigners within it. But what encourages risk? Fear, or a safety-net certainty that if a gamble fails, one can always play again? Similarly, if we want workers to accept the new arrangements, how do we assure them that if they accept the flexibility, they will not be the victims but rather the beneficiaries of the ever-greater social value and wealth that is being created? All studies of technology adoption have shown that those who believe they will be victims will resist; if they believe they will be beneficiaries, they may help facilitate the shift. Of course, the largest group consists of those in the middle who are joining the platform economy because they have no choice and do not feel empowered to resist.

Balancing the need to sustain initiative while cushioning the consequences of significant socioeconomic transformation leads us to a focus on social policy, not just market policy. Social policy, sometimes called welfare, shapes the risks that workers and entrepreneurs take and their evaluation of whether to support or resist change. In the United States, benefits such as pensions and health-care coverage (the latter, until the passage of the Affordable Care Act) have been tightly tied to employment. Lose your employment, lose the protections. The U.S. debate often assumes that expanded welfare protections dampen initiative, pointing to Europe as an example of how investing in social protections limits economic dynamism. Aside from whether this was, in fact, ever the case in Europe, the question is whether social protection will inherently discourage initiative now. In our view,

the real issue is never the fact of protections themselves—and indeed we believe that facilitating social and economic adjustment by easing the burdens of those dislocated is both a social obligation and an economic necessity—but how social policy is paid for and organized.

The emerging platform economy, with expanding contract work and gig employment, has encouraged many to look at the Nordic social policy model. The Danish flexible security model suggests that social protections can lubricate the engines of change. Simply put, many social benefits in that model are associated with citizenship, and the notion of flexible security gives employers extensive rights to adjust their workforce as needed while still providing workers with social protections in the form of training, job placement, and basic income. Certainly, this is no panacea, and indeed the Nordics are themselves reopening and intensely debating the character of their social policies. But we must consider whether addressing the downside risks of entrepreneurial efforts while providing worker flexibility with broader social safety nets as social rights can make the platform economy a source of sustainable growth. What assurances of social safety do we want to give to risk takers?

The debate over policy will not be straightforward or simple. As with all economic transformations, the disruptions will create winners and losers. Who will decide how the results of increased productivity are distributed? The reality is that the winners and losers in markets depend on who can participate and on what terms. There are no markets, and no market platforms, without rules, but what happens to the politics if important market rules are made unchallenged by the platform owners? Many political struggles will be waged over these rules, and those fights will be part of defining the market and society in a platform era. Political fights will break out over protections for communities, clients, and workers as markets are disrupted. Some of those fights will be about business models that are playing a game of policy arbitrage, whereas others may be about rules for the consignment platforms. In any case, how many instances of disruption will there be? Should we view these disruptions as creating a flood of viable entrepreneurial possibilities or as destroying the security of employment relations for many? Can they create new sources of income and reasonably compensated work? Can policy encourage labor market arrangements that facilitate innovation, provide protection for workers, are efficient, and promote decent, sustainable lives for citizens? In

the platform world, is there a Henry Ford who recognizes that everyone in the ecosystem requires a reasonable income in order to buy his products? This will not be a straightforward process. The reorganization of the economy around platforms will inevitably change the very configuration of the interest groups that influence how the law tries to shape the code. In sum, these battles, often engaged in isolation from each other, will interweave to reshape our communities and social life, as José van Djick has shown, as well as the character of markets and market competition.

In the era of the platform, the future remains open. Answers to crucial questions are for the moment unknowable. The answers depend on our choices, not just on the technology. For example, will cloud technologies and the platform-driven economic reorganization they cause drive the productivity growth on which sustained real income improvement occurs? Will these reorganizations destroy jobs or reduce the required skill levels?

The technologies—the cloud, big data, algorithms, and platforms—will not dictate our future. How we deploy and use these technologies will. When we look at the history of innovations such as electric utility grids, call centers, and the adoption of technology standards, we find that the market and social outcomes of using new technologies vary across countries. Once we start on a technology path, it frames our choices, but the technology does not determine in the first place exactly which trajectory we will follow.

We will be making choices in an inherently fluid and ever-changing environment shaped to some degree by unpredictable technical change and social reactions to these changes. Ultimately, the results will depend on how we believe markets should be structured—who gains and who can compete; how we innovate; what we value in society; how we protect our communities, our workers, and the clients and users of these technologies; and how we channel the enormous opportunities created by these sociotechnical changes. It is up to us to sidestep a dystopia and to create, if not a utopia, at least a world of ever greater benefit for communities and citizens.

*Martin Kenney (mfkenney@ucdavis.edu) is professor of community and regional development at the University of California, Davis. John Zysman (zysman@berkeley.edu) is co-director of the Berkeley Roundtable on the International Economy and professor emeritus of political science at the University of California, Berkeley.*