Choosing a Future in the Platform Economy: The Implications and Consequences of Digital Platforms

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We are entering a Platform Economy; one in which tools and frameworks based upon the power of the internet will frame and channel our economic and social lives. The algorithmic revolution, an application of an array of computable algorithms to a myriad of activities from consumption and leisure to services and manufacturing, is the foundation of this digital transformation. [i] Now algorithms live in the cloud and form the basis of digital "platforms". For our purposes, "platforms" are "frameworks that permit collaborators – users, peers, providers -- to undertake a range of activities, often creating de facto standards, forming entire ecosystems for value creation and capture."[ii]

The Cloud is at once infrastructure, marketplace, and ecosystem. [iii] The variety of platforms nearly defies categorization. To illustrate, Google and Facebook are digital platforms providing search and social media, but also platforms on which other platforms are in turn built. Amazon is a marketplace as are Etsy and eBay. AWS (Amazon Web Services) provides infrastructure and tools with which others can build their while Airbnb and Uber are forcing deep change on quite different businesses. These diverse platforms, residing in the cloud, however we categorize them, are provoking a profound economic reorganization of markets, work arrangements, and, fundamentally, of value creation in the contemporary economy.

Our basic premise is that the emergence of a platform-based economic reorganization will not dictate our future, though undoubtedly it will and is already beginning to frame the choices we are making.[iv] How we deploy those tools, choices that will reflect corporate strategy and public policy, will condition the society we are building. Will the Platform Economy, the reorganization of markets, enterprises, and social organization it portends, catalyze economic growth and a surge in productivity driven by a new generation of entrepreneurs? Or will the reorganization concentrate gains in the hands of those who generate the platforms and possibly even stifle future entrepreneurs? Will it spark a wave of entrepreneurial possibilities, or an avalanche of dispossessed workers trying to make their way with gigs and temporary contracts? Ultimately, what do we need to know and understand to shape this future?

How pervasive will the platform effect be? Disruption is the word of the day; the sense that many traditional business models, organizations, and forms of organizing value creation will be either swept aside or radically transformed. Although control or

ownership over platforms is a separate matter, groups of "peers" coordinating activities and transactions on platforms challenge existing business models, as, for example, taxi businesses are being threatened by Uber, the music industry by iTunes, Pandora, and Spotify, and the camera industry by GoPro, which, through the use of its website, is trying to organize itself as a platform firm, even as entirely new activities such as YouTube and app stores emerge.

We must consider what the impact of platform strategies will be on competition in diverse segments of the economy, and what competitive strategies will be introduced. Online stores, long ago, have emerged in the retail sector. Consignment businesses have grown dramatically and opened the way for an array of newly minted entrepreneurs. And we know that many products have become parts of systems, the classic instance being the iPhone that provides access to a platform store that has a previously unimaginable variety of virtual products.

The effects will certainly vary across sectors in very different ways. While some will question whether productivity and growth will be accelerated, the more profound question may be whether economic and social life will be transformed and whether the outcome will lead to a very different distribution of wealth and power in global society. The platform is likely to effectively define the digital era, with the algorithm and Internet and cloud as the building blocks. We contend that we are seeing a digital transformation, which will extend to the Internet of Things and beyond, that is only beginning and is likely to release enormous creativity, but also wicked problems of management.

What will the Platform Economy do to work and entrepreneurship, income, and inequality? For example, platforms, creating new opportunities for earning income, are generating an array of entrepreneurial opportunities, but of what sort? Will we have an increasing number of Laundromat entrepreneur equivalents; viable in their own right but unlikely to generate sustained productivity and growth, reflecting the patterns of growth rather than generating them? Will platforms induce in turn a set of new businesses that in their turn will drive employment and growth? Or, put differently, will the result of the platform transformation be a community of incipient entrepreneurs or vulnerable workers?

Work is being reformatted. For many, traditional employment – a single organization providing long-term engagement, usually with some form of social benefits — is giving way to gig and contract arrangements. Not surprisingly, business strategies shape job quality. Even in low-margin, low-price business there are "better" job strategies that can provide workers higher wages and benefits and contribute to a strengthened competitive position for the firm. In the aggregate, the shifting place and character of entrepreneurship and the reorganization of work may powerfully alter the distribution of wealth and income in societies.

Assuming we are moving to a Platform Economy, the first question to be asked is what is required? There are four elements that need to be addressed. At first glance each is evident, but with a deeper look the answers of what to achieve and how to achieve it in each case are not as evident:

1. Infrastructure: We know that appropriate infrastructure is needed, however, we need to answer what type of infrastructure is needed and how we achieve it? Does it just require ever faster broadband access to the community as a whole? Or does effective infrastructure require the tools and training for firms and consumers? Should these be provided as a public utility or by the market?

2. Training and Skills: The classic question is whether the Platform Economy requires a new set of skills, or only a recasting of emphasis. Certainly, widespread comfort with using platforms and apps will be needed. But does that require a heavier investment in STEM or in design and art? The answer is much less obvious than it might appear.

3. Social Protections: Will encouraging entrepreneurs and contract work arrangements be facilitated by broadening social protections? Or will those protections simply inhibit the flexibility required of the economy?

4. Regulatory Transitions: Rules and regulations for the market place and labor markets will not adapt themselves to the needs and logic of the platform economy. Moreover, this transition will see debates and fights, nodes of contestation, about the adaptation of those rules. There will be struggles about protections for communities, clients, workers, and the market itself. For *communities*, the evident instance is whether Airbnb represents a change in land use; do I want a virtual hotel in my neighborhood? And should the Airbnb host be able to discriminate against folks she does not want to welcome, whereas a hotel is legally proscribed from discriminating. For *clients*, do I want

assurance of health and safety in my Uber car or my Airbnb rental? For *workers* what risks should I bear; what risks should be with the platform owner? Indeed when are workers contractors and when are they employees, a matter being adjudicated now in a number of states and nations? And for the *market* itself, what protections, competition policy, are required to preserve competition itself. The European Union's efforts to regulate Apple, Google, Facebook, and the other globally dominant, Silicon Valley-domiciled platform leaders is an example.[v] In fact, what are the competition issues, when dissatisfaction with, say, Google Search, can lead to a costless, seamless, and immediate switch of Microsoft's Bing or the independent DuckDuckGo?

Finally, we should consider whether U.S. entrepreneurs or, more specifically, Silicon Valley or Silicon Valley-inspired entrepreneurs will retain their early and, at this point obvious dominant leadership in a platform era. Throughout the digital era and this current wave of change, American policy initiatives and firms have led the way. The enormous success of Silicon Valley in finding and funding new products, firms and disruptions makes it seem that the digital transformation is an American prerogative, and that others can only follow and whine.

While generations of digital change have issued forth from Silicon Valley, inevitability is only the truth until things change. Henry Ford, we are often told that Americans launched the era of mass production that represented American innovation and contributed to an era of American predominance; indeed policy makers and scholars alike referred to Fordism as an economic revolution. Then seventy years later Toyota arrived, and the American advantages became obstacles. As Cohen and Zysman observed in 1988, the U.S, faced decades of manufacturing decline; comebacks were slow and there was an erosion of our manufacturing base and domestic skill sets in this field.[vi] The breakthroughs that occurred in Silicon Valley did not help the industrial heartland, as Florida and Kenney argued in 1990.[vii]

Can this happen again? Let us not too quickly point gleefully to the mistaken overenthusiasm regarding Japanese successes in consumer electronics and semiconductor successes that faded as the Silicon Valley-driven U.S. entrepreneurial firms reasserted themselves through success in software-driven electronics. Rather than dismiss the question, we should ask what might happen were a surge in Platform leadership to emerge from outside the United States?

What challenges will that pose? To establish the reality of this question, let us note two possibilities. First, the huge size of the Chinese market suggests that platforms bred in that largely protected market could possibly have the scale and financial sustainability to both move abroad and to begin to establish standards. Although with the possible exception of Alibaba, there is no evidence yet for them gaining traction even in East Asia. Will this change? Second, German manufacturing is concerned to maintain position in what is labeled *Industrie 4.0*, which is what they term the Internet of Things. They want to assure that their small and middle-sized firms as well as major manufacturers both capture the advantages of platforms and next generation cloud based computing, and defines that trajectory globally. Put generally, will the real industrial and service business strengths of the European firms in manufacturing, as well the Chinese operating behind protectionist barriers, create application domains with which they can out-compete U.S. entrepreneurial firms?

For now, as a beginning, we return to our basic premise. The Platform Economy is upon us. What it means for our economy and society will be a choice, not an inevitable unfolding of the technology.

The labels:

How we label this transformation matters. Labels specify the targets for our policies, strategies, and studies. This digitally founded new economy has been given a variety of names based on some of its perceived attributes. Each of these names lends themselves to the study of different outcomes and activities over others. At various times it has been called the Creative Economy[viii] and by contrast, the Gig Economy/the Precariat/1099 Economy[ix] focusing on the impact this emerging economy is having on work.

Recently the label of Sharing Economy has been popular[x]. However, much of the activity labeled 'sharing', such as Uber and Airbnb is now very far from the visions of Wikipedia, the shared construction of a knowledge tool; of Napster, sharing music whether legally or not; or open source software rules. Despite the attractive label and the entrepreneurial successes, there are downsides to calling this a Sharing Economy. Uber and Airbnb are entrepreneurial initiatives that facilitate the conversion of consumption

goods like automobiles and apartments into commercial offerings, closer to 19th century working class women taking in boarders, or they facilitate gig work by drivers providing their personal vehicles or buying vehicles to join the game. This "sharing" can and often does resemble a putting-out economy from early industrialization before factories, but with the "putting out" of work to individuals run on digital platforms. Simultaneously, the rapidly growing mobile phone apps and user-generated content firms such as YouTube or Instagram are structured as digital consignment industries, borrowing from the compensation scheme used by artists working for galleries, for example. Airbnb has some aspects of this also.

The Platform Economy is our preferred term for this emerging organizational model. Why? Digital platforms are the base upon which an increasing number of connection-based activities – marketplace, social, and political - are being organized. If the Industrial Revolution was organized around the factory, today's changes are organized around platforms, algorithms applied to enormous databases running in the cloud. The salience of these digital platforms suggest that we are in the midst of a reorganization of our economy in which the platform firms are developing power roughly equivalent to that of Ford, General Motors, and General Electric of earlier eras.

The Debates

There is a ferocious debate about whether the future of the Platform Economy, or whatever label we choose for this digital transformation, will be a utopia of abundance or a dystopia of limited employment and stunning inequality.

The early pioneers in the industry - particularly those on the West Coast including Bob Noyce, Steve Jobs, and Bill Gates -truly believed they were creating the future, opening the world's possibilities and prospects[xi]. And the optimists still abound; indeed San Francisco has now been called the new Hollywood as visions of profitable disruptions mobilize entrepreneurs and data scientists.[xii] For investors, inherently optimists, who search for profitable activities, the question is, then, how value is created and captured in the platform era. Many point to the benefits of the emerging platforms. Zipcar, by reducing the need for individual auto ownership, or at least potentially increasing access to auto transport by those who do not own vehicles, stands as a commercial vision of sharing,

which is really a particular form of rental[xiii], alongside true sharing activities such as Wikipedia.

However, as we have already noted, that optimistic, utopian, version that contract workers are simply proto-entrepreneurs who treasure their flexible schedules often collides with claims that these are simply a new precariat, dependent contractors in precarious roles, a form of modern putting out. Similarly, the utopian version argues that platforms such as Uber and Lyft can unlock the commercial value in underused personal goods; apartment rooms or cars can become investment goods in commercial markets without consequences for the community. This is a large assumption. Similarly, the platform businesses that match workers and tasks may make labor markets more efficient, but at the same time can generate fragmented work schedules and increasing levels of part-time work without the employment-related benefits that previously characterized much full-time work.

Will, then, the tools we have built turn on society? Even as the digital era unfolded in its utopian phase there were skeptics; perhaps most prescient was the novelist Kurt Vonnegut in his first novel, *Player Piano*[xiv]. Vonnegut envisioned a digital future of abundance - albeit a digital future on machines built with tubes not yet semiconductors – with radical social division between a creatively employed and highly credentialed 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 the vast swath of the population. Bill Davidow, once at Intel and then at his own Silicon Valley VC company, expressed this in the business literature in "What Happens to Society When Robots Replace Workers?"[xv] There has been an outpouring of popular books and more formal articles from the economics profession arguing that jobs will be displaced by digital automation and robotics. The best known and popular economics expression of this belief is *The Second Machine Age*[xvi].

The question really is what balance will there be between jobs created as the digital wave flows through our economy and society and what jobs will be displaced? Certainly it is feasible to catalogue existing work, particularly work which is routine and fully characterizable, as likely dislocated by digital tools, and perhaps estimate the numbers of such existing jobs that may be informated away[xvii]. More difficult and only open to

speculation though, are the new kinds of work being created and that will be created. Some of the early indicators can be enumerated, but certainly not exhaustively counted. Algorithms and databases are automating work, but even as this occurs "new work" is being created. There will be new products—goods and services as well new production processes, processes that are likely to be design and creativity intensive, as well as technology intensive.

Moreover, the character of some – much or little, we cannot know - existing work will be reframed but not eliminated by digital technology. Uber, TaskRabbit, Handy, and other platform firms are transforming industries by connecting "workers" 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 occupations or occupational branches. Finally, existing organizations are creating digital and social media marketing departments and jobs. The question in these cases is not whether there will be jobs, but what system of control and value capture is in place. Our sense is that, across the board, "employment" appears to be more precarious than ever.

These changes are not likely to result in the "workerless" society, but rather we risk a society within which the preponderance of the work and value creation is more dispersed than ever before, even as the platform owner centralizes the transactions and captures value from activities on their platforms. Importantly, we can only speculate on what will be the balance and character of firms and jobs destroyed, created, and transformed and the character of the work and organizations generated.[xviii]

Indeed, we would note that there is a classic dilemma in the use of digital automation: anything that can be characterized sufficiently to become computable can be copied. [xix] At that point, another round of innovation and imagination is required[xx]. Can automation innovate itself? Or will teams of people and digital tools be required to be competitive? Note that the Turing Test might establish that a digital machine can imitate intelligence; but the test does not establish, or purport to establish, consciousness, nor consider whether human consciousness differs in fundamental ways from current algorithmic tools.[xxi] The debate over jobs created or destroyed cannot be resolved.

Importantly, we can only speculate on what will be the balance and character of firms and jobs destroyed, created, and transformed.[xxii] We can, we emphasize, only examine indicators and traces.

We are confident, though, that the outcomes, jobs created and jobs evaporated or transformed, will depend not on the technology itself but on how the technology is deployed. Choices about deployment will turn on entrepreneurial initiative, corporate strategies, and public policies. We know for example that the consequences of the deployment of RFID technology in retail differed dramatically in Denmark, France, and the United States. The outcomes, interestingly, were not a product of labor management fights, but of conflicts between producers and distributors.[xxiii]

Similarly in the discussion of the Internet of Things, or the digitally based reorganization of manufacturing, we find significant differences among national emphasis and investments.[xxiv] 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? The strategies for deployment are, of course, precisely the substance of our choices for a future in the Platform Economy.

The Algorithmic Revolution [xxv]and Clouds[xxvi]: Technical Foundation of the Platform Economy

The algorithmic revolution and cloud computing are the foundations of the Platform Economy. Computing power in itself is only the beginning of the story. That computing power is converted into economic tools by algorithms operating on the "raw material" data. When aspects of activities can be converted into formalizable, codifiable processes with clearly defined rules for their execution, they can be reduced to computable algorithms.

The software layer that stretches across and is interwoven with the economy is a fabric of algorithms[xxvii]. That software layer, that algorithmic fabric, covers manufacturing, is the Internet of Things/Internet of Everything/Industrial Internet with its implied webs of sensor networks. This includes services, which in turn often employ those sensor networks, and covers diverse other activities, social and political, as well as economic. 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. Sometimes costs drop

through open-source software, "the race to zero" in cloud computing, and other times by the ability to collectively provide the tools through on-line platforms or commercial physical sites such as TechShops[xxviii].

Cloud computing is about how computing is done; it is much less about geography, where it is done. [xxix] It rests on virtualization and abstraction of computing processes[xxx]. While the details of how it works do not matter to our discussion, the consequences do. We should note that the major *providers* of cloud services remain, at least for now, large American firms that developed the Cloud paradigms and then cloud systems for their own internal use. For provision, scale does matter. For *users* – individuals, SMEs, start-ups, and corporations alike – the consequence is a radical reduction in the cost of computing resources and ICT tools. As important, as is now widely recognized, the terms of access to computing resources change as well. Users can "rent" resources in units rather than having to own or build out entire computing systems. Computing, and the applications and platforms it facilitates, are then available as an operating expense rather than a capital expense. Let us link the story of algorithms and that of cloud computing to the emerging Platform Economy.

Algorithms go to live in the "Cloud" and dramatically ease the creation of platforms.[xxxi] Digital Platforms are, then, computing frameworks upon which users can undertake a range of activities often forming entire ecosystems for value creation. Many of the current Internet platform firms use Amazon Web Services (AWS). So, indeed platforms can grow on platforms, as an array of applications. Many of those platforms on platforms are what we would call complementors. Complementors include emerging actors such AppAnnie that ranks the revenue generated by apps, advertising "agencies" that analyze your YouTube advert buying, and TubeMogul that classifies YouTube "stars' and measures their "reach", and a myriad of agencies that cultivate new YouTubers. These "complementors" are powerful allies in building and maintaining the lock-in for the "master" platform. Platforms are, to put this differently, algorithm-enabled "cyberplaces" where constituents - people or machines - can act or transact. 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.

Making Sense of the Diversity of Platforms in the Platform Economy

Digital platforms, based on algorithms and databases, are restructuring ever-more parts of the global economy. In many cases, they have disrupted the existing organization of economic activity by resetting entry barriers, changing the logic of value creation and value capture, repackaging work, and/or often repositioning power in the economic and network system.

Speculations aside, we have for the moment, no real theory of the effect of these diverse platforms on the overall economy, or indeed a particularly dominant approach to categorizing platforms. The intent here is to begin to structure a discussion of how an economy increasingly organized to operate on platforms affects the organization and practice of competition, work, and entrepreneurship . Traditionally we have categorized by sector, but sectors are blurring[xxxii]. A smartphone is at once a communications device through several media, a camera, and a music system, to start a list. We might ask whether the consequences of platforms differ by the original sector being transformed, but ultimately sector is not a very good organizing category for understanding the platform economy due to this blurring of sectors.

Perhaps we should categorize platforms by function or business model? Here again, categories blur and overlap. As a result an initial partial listing is choppy, an awkward cut into the complexity.

1. *Platforms for platforms*: In a sense, the Internet itself is the foundation of the platform economy, but there are a series of businesses that then provide the infrastructure and tools for the rest.
    a. For example, Amazon Web Services facilitates the construction of Cloud Services, the tools with which other platforms are built.
2. *Platforms mediating work:* In some platforms, this resembles the function of electronic headhunters or HR departments. In other cases, it can be seen as a modern form of the putting out system of 19th century industrialization. Mediating work itself has many versions which include these:
    a. *Globally Biddable Work:* Examples include Odesk/eLance (since renamed Upwork), Innocentives, and, of course, Amazon Mechanical Turk.
    b. *Occasional Informal Work*: Facilitated by apps and thus, cyber formalized. Task Rabbit, Handy, and Homejoy are perfect examples of this.
3. *Platforms making tools become available online*: Github is becoming the repository of open source software programs of all kinds available to anyone wishing to use them. This dramatically reduces the cost of software tools and building blocks.

a. Automated HR, Zenefits, Job Rooster, and Wonolo all provide diverse HR functions. Zenefits provides an online marketplace of HR tools free to small businesses and in the process is disintermediating the local insurance broker.

4. Electronic goods markets for retail and business run an entire gamut

a. Virtual markets for physical goods: Etsy and eBay would be quite distinct versions of this.

b. Retail sales platforms such as Amazon or hundreds of company specific apps.

c. Apple and Android "stores" are platforms that facilitate the diffusion of still other apps.

d. Virtual consignment platforms such as YouTube, Amazon self-publishing, and many others.

5. *Platforms intending to transform service industries*:

a. Airbnb and Uber are examples of platforms intending to convert consumer goods into investment goods. For example, rather than sharing, Uber connects drivers with customers algorithmically. In this case, drivers are treated as contractors that puts them in a more precarious position.

6. Shifting the place of intermediaries in Finance.

a. Platforms such as Kickstarter or Indiegogo for project funding can replace traditional intermediaries.

b. Finance platforms that displace traditional financial institutions., e.g., AngelsList for venture capital, or Zopa or Rate Setter that support for peer-to-peer lending

7. Facilitating social and political organization, including worker organizations

If we start with our categories of platforms above, does it provide insight into the character and ability to scale the entrepreneurial opportunity? Diverse as they are, all these platforms have created business ecosystems, repackaged work relationships, and/or transformed terms of competition.

These platforms represent a multiplicity of business models and functions; and raise an array of questions that suggest wildly varied answers. As a place to start a discussion, we might ask these questions of each platform, or type of platform.

∗ *How is value created?* Indeed, the platform economy itself is a distinctly new set of economic relations resting on the Internet. The ecosystem created by each platform is a source of value and sets the terms on which owners and platform users can participate.

∗ *Who captures the value?* There are a variety of mechanisms with varied implications for gains distribution .

o Some platforms allow the owner to "tax" all transactions, while others monetize their services through advertising

o Platforms can transform work previously done by traditional employees, into contractors, consigners, or quid pro quo workers or create entirely new categories of work.

o There are then what Gina Neff (2012) called "venture laborers", i.e., the persons working in the platform firms themselves. They receive high wages and more

significantly, if the firm is successful, the value of the platform is capitalized in the stock markets resulting in remarkable amounts of wealth for the firm's direct employees and entrepreneurs.[xxxiii] If the firm falters or fails, these individuals must find new employment.

- There are "mini-entrepreneurs", from one vantage, or precarious "consignment workers", from another. These are the individuals who provide goods, usually, but not necessarily, "virtual", for platforms such as the App stores, YouTube, or Amazon self-publishing. While many of these will be unsuccessful or marginally profitable, some can be enormously successful and, while as yet unmeasured, it seems very likely that this is creating many more opportunities for entrepreneurship. And, in certain cases, particularly in Apps, those in the consignment economy may grow so large that venture capitalists will invest in the entrepreneur/firm and the employees will become venture labor. Some of these apps can become platforms themselves. Put differently, the consignment level has significant upside for participants, but this is accompanied by high-risk.
  - *Who owns or controls the platform?* The answer is differs and it makes a difference. For example, for users and producers the differences between Wikipedia where the network is managed by consensus set of rules; the Danish Agricultural cooperative platform in which participant owners know each other and there are clear boundaries between inside owners and others; and Uber where the platform is owned by a small tightly held firm funded by venture capitalists, whose value will eventually be capitalized by sale of control either through acquisition or a stock offering.
- Power may be centralized as platform controls the locus of transaction and the communication system ideally separating buyers or users from providers and providers from buyer, or decentralized such as the way Wikipedia diffuses power over content.
  - *How is work packaged and value created?* Certainly some workers retain traditional employment relationships; those employed by Microsoft, Google, LinkedIn, and Facebook. In fact, these firms, while expecting long but relatively flexible working hours, with free food and drinks, transportation, and a myriad of other benefits can seem almost like corporate paradises. While those working through digital platforms on gigs, consignments, or contracts have radically different relations, though the hours are flexible and largely self-controlled.[xxxiv] One important question, then, is what percentage of work is now organized in these radically new ways.
  - *What is the distribution of risks and rewards for those in these various* ecosystems?

The Consequences of Platforms for Entrepreneurship and Work

These two issues are tightly interwoven: entrepreneurship and the packaging of work. Consider entrepreneurship. Media attention and much talk in the venture community is on "disruptions", which appears to be where massive opportunities exist. Uber disrupts taxi companies; Airbnb challenges hotels; Zenefits threatens local insurance brokers. But how many instances of disruption are there? Do these disruptions create a flood of viable entrepreneurial possibilities or destroy the security of employment

relations? Do they operate to create new sources of income and reasonably compensated work throughout the society?

It is evident that platforms open an array of entrepreneurial opportunities. Some entrepreneurs, like Robin Chase at Zipcar envisioned an alternative social, not just economic, model: Own a car or make occasional use of one accessing the vehicle through the Zipcar platform. If that model spreads widely, it would result in a drop in overall demand for auto production. This may or may not disrupt Hertz, (Zipcar was sold to Avis).[xxxv] But could it also dramatically affect automakers if fewer persons buy automobiles? In other words, such "sharing" solutions could have unforeseen ripple effects on entire market ecosystems, as encyclopedia producers found out to their dismay.

Many platforms by their very nature prove to be winner-take-all models; in which only one or two platforms survive and the platform owner is able to appropriate a portion of the entire value created by all the users on the platform; which in aggregate can be enormous. However, more important, is that the power is centralized to the platform owner who after winning the initial competition becomes a monopolist that can make decisions to maximize their own welfare. At the same time the monopolist platform owner squeezes the platform community - the drivers on Uber, the content providers, the consigners - who are instrumental in producing the value in the first place..

Consider, by contrast, how platforms affect work. What happens in these different business models to the organizational forms of work, to the form in which work is packaged? Conceptually, if not literally, Uber converts taxi company employees or former medallion owners into contractors whose access to income is through the Uber platform. Are these contractors mini-entrepreneurs? Or are they neither and just extremely precarious workers relabeled as contractors? In the case of some of the Airbnb offerings, are these not just another form of rentals as some are just transforming apartments they may own from long-term residences to short-stay offerings. Is this entrepreneurship in any significant way? Moreover, how do we understand those individuals producing apps or YouTube videos, or self-publishing books on Amazon in the hope of being one of the winners? For these individuals, there is a power law of returns, a few big winners who are remunerated by advertising, product placement fees, and personal appearances, while

there is a very long tail of producers who basically are creating the vast bulk of consigned content without compensation.

Considering disruptions, mini-entrepreneurs, contractors, and gig workers leads us to ask: does the platform economy point to an even more unequal society? Does the answer depend on the character of platforms, or of the policies and politics of the platform economy?

Policy and Politics

The policy objectives and concerns in a platform era seem evident. The late 19th century saw the emergence of the corporate organization as a means of orchestrating economic activity and organizing markets.[xxxvi] In the 21st century, we might speculate, the platform in the cloud takes on a variety of these functions. Hence take Google, the platform economy giant. It is itself now a large firm, and yet has only 50,000 employees. Uber has only roughly 1,500 employees and already is a global business. So, for example, what sort of policy and political issues emerge when the orchestrators of economic activity are relatively small firms rather than organizations as large as Ford Motor Company, General Electric or, the behemoth of them all, General Motors were in their heyday?

Some policy issues: From American standpoint we must ask, how policy will influence the entrepreneurship and work in a cloud-founded platform economy. Let us set aside, in this brief essay, two essential questions; first, whether cloud technologies and the platform-driven economic reorganization they prompt will drive productivity growth, and second, whether the reorganization on balance destroys jobs or reduces the levels of skill required. [xxxvii]

We ask, instead, different questions: whether on balance the array of entrepreneurial innovative opportunities are widespread or will hover around a few big winners, and an array of small–scale, highly vulnerable players. Do we create a new source of productivity or 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? Do we generate labor market flexibility or a "precariat", as some believe, that resembles a cyberized Downton Abbey replete with a new and sizeable underclass.

The policies we adopt may determine the balances achieved in the platform era. 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/consigners within it. 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 flexibility, how do we assure them that, if they accept the flexibility, they will not be the victims rather than beneficiaries of ever the greater social value and wealth that is being created? As victims they will resist; as beneficiaries, they may help facilitate the shift. Stated simply, public policies will shape the gains, risks, and responsibilities both for work and entrepreneurship.

How then can we make the Platform Economy a vibrant source of growth? There are two public policy domains that we view as critical. First, social policy, sometimes just called welfare, shapes the risks workers and entrepreneurs take, and their evaluation of whether to pursue or resist change. In the United States benefits such as pensions and medical coverage, until the emergence of ObamaCare, have been tightly tied to employment. Lose your employment; lose the protections. The American debate often assumes that expanded welfare protections mutes initiative,[xxxviii] pointing to Europe as investing in social protections at the cost of economic dynamism. Whether this was in fact ever the case, the question is whether social protection will inherently mute initiative now. The real issue was never the protections themselves, but how they were organized. The Danish flexible security model provides evidence that social protections can lubricate the engines of change.

The Platform Economy with expanding contracted work and gig employment should lead us to look again at the Nordic social policy model. Simply put, many social benefits are attached there to citizenship rights; and the notion of flexible security gives employers extensive rights to adjust their work forces as needed while still providing social securities, protections, to workers in the form of training, job placement, and basic income. Certainly, this is no panacea; ongoing struggles to sustain employment endure and there are continuing fights about these programs. But we must consider that in this environment, addressing the downside risk of the entrepreneurial efforts while providing worker flexibility with broader social safety nets as social rights may make a Platform Economy a

source of sustainable growth. What assurances of social safety do we want to provide to risk takers, to encourage those risks? Could Uber get drivers in an environment with a greater social safety net and reasonable basic standard of living guaranteed – the evidence from Europe suggests an emphatic "yes," as governments are having to control drivers for Uber?

Second, what market rules are appropriate for a Platform Economy? There will be an array of political struggles over these rules, and we should welcome them as part of defining the market and society in a cloud/platform era. There will political fights about the protections against market disruptions to be provided for communities, clients, and workers. Some of those fights will be about business models playing a game of policy arbitrage, while others may be about rules on the consignment platforms. In this game, 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 clients, communities, workers, and markets themselves.

These are classic issues, but it is worth working through examples and formally laying out the problem. Taxi companies pay insurance that protects clients and other drivers should their employees have accidents. What insurance protections should be required for Uber or Lyft and who should pay for them? Airbnb effectively ignores, in many cases, land use rules intended to preserve particular community values. Should that be permitted? A taxi cab driver is legally required to pick-up anyone hailing the cab in any part of town, an Uber driver can refuse. A hotel must lodge a boarder regardless of ethnicity, they cannot decide that a person's religion or ethnicity is undesirable. Should the same apply to Airbnb hosts? With these examples in mind, policy arbitrage is not the ideal basis of a new competitive business model.

The list of policy domains that will have to be rejiggered in a platform era must include competition policy, taxation rules, service provision requirements, and intellectual property rules. We may want to review existing public policies with this notion in mind of likely pressure for policy revision generated by a platform entrant playing the arbitrage game. Importantly, it is not possible, or even appropriate, to simply declare that the old rules and values will apply in this new era. For one thing, it is not always possible to just transport the values of one era to the next; platforms raise new issues about market

dominance and the ability to extend position in one market into another. We only have to look to Europe to the struggles about Google, and look back at the battles around Microsoft. As seemingly settled fights in all these policy domains are reopened, the issues will be refought, and new outcomes can be expected[xxxix].

Conclusion - Some Takeaways to Consider

The future in an era of cloud and platform remains ours to choose. The technologies - the cloud, big data, algorithms, and platforms - will not in themselves dictate our future. How we deploy the technologies, and the rules set for their deployment and use, will be critical. When we look at cases such as electric utility grids,[xl] call centers or RFID in retail we find that the market and social outcomes of new technologies vary across countries. Of course, once technology is concretized, once we start down a technology path, they frame choices.[xli] Larry Lessig, what seems like long ago, wrote that Code is Law[xlii] and code is increasingly West Coast law. If not solely the technology, what then explains between and within country variance around the Platform Economy?

Deployments differ with corporate strategies and public policies. There are obviously many issues, so let us just highlight a couple. Consider corporate strategies: one issue is whether companies view workers as only costs to be contained, or as assets, even in an era of algorithms robots and automation, to be developed and promoted[xliii]. And, as important, whether those assets are directly tied to the firm and therefore who should bear the costs of their conservation and improvement. In other words, the old question of what are the boundaries of the firm are being reposed. Consider policies: what balance do we seek between flexibility/adaptability and social protection? Do we recognize that flexibility can often come with protections against risk?

The consequence is that we will be making choices in an inherently fluid and ever-changing environment shaped by, to some degree, unpredictable technical change, and also social reaction to these changes. Ultimately, all of this will depend upon how we believe markets should be structured, what we socially value and how we will channel the enormous value that these socio-technical changes are creating.

[i] J. Zysman. 2006. The algorithmic revolution---the fourth service transformation. *Communications of the ACM*. 49 (7).

ii The direct wording is borrowed and slightly modified from J. Mattila and T. Seppala. 2015. "Machines in a Cloud –or a Cloud in Machines? Emerging New Trends of the Digital Platforms in Industry and Society." June. The foundational book describing platforms and their use is A. Gawer & M. A. Cusumano. 2002. Platform leadership: How Intel, Microsoft, and Cisco drive industry innovation. Boston: Harvard Business School Press. See, also, the more recent, A. Gawer & M. A. Cusumano 2014. Industry platforms and ecosystem innovation. *Journal of Product Innovation Management* 31(3), 417-433.

[iii] K. E. Kushida, J. Murray, and J. Zysman. 2012. "The Gathering Storm: Analyzing the Cloud Computing Ecosystem and Implications for Public Policy." *Communications and Strategies* 85:63-85

[iv] For a theoretical conceptualization of platforms as private market regulators, see K. J. Boudreau & A. Hagiu. 2008. Platform rules: Multi-sided platforms as regulators. Available at SSRN 1269966.

[v] For an early discussion of the issues, see P. Ballon and E. Van Heesvelde. 2011. ICT platforms and regulatory concerns in Europe. *Telecommunications Policy*, 35(8), 702-714.

[vi] S. Cohen and J. Zysman. 1988. *Manufacturing Matters: The Myth of the Post-Industrial Economy.* New York: Basic Books.

[vii] R. Florida and M. Kenney. 1990. *The Breakthrough Illusion: Corporate America's Failure to Move from Innovation to Mass Production*. New York: Basic Books.

viii R. Florida. 2002. *The Rise of the Creative Class*, New York: Basic Books.

ix G. Friedman. 2014. "Workers without employers: Shadow corporations and the rise of the gig economy" *Review of Keynesian Economics, 2*(2): 171-188. G. Standing, (2011). *The Precariat: The New Dangerous Class*. London: A&C Black.

x Yochai Benkler is an early proponent of this framing. See, for example, Y. Benkler, 2006. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, New Haven: Yale University Press. For a critique of Benkler, see J. V. Dijck, 2013. *The Culture of Connectivity: A Critical History of Social Media*. Oxford: Oxford University Press.

xi Robert Noyce founded Intel, Steve Job established Apple, and Bill Gates founded Microsoft. Others in that early cohort, particularly the semiconductor industry folks who were driving the revolution, included Jerry Sanders of AMD, Charlie Sporck of National Semiconductor, and Bill Davidow who has re-emerged after a career at Intel and in venture capital, as a commentator, now of the pessimistic sort, on our digital futures.

xii J. Gapper. 2015. "Silicon Valley has become a dream factory." *Financial Times* May 20, 2015.

[xiii] Unsurprisingly, Zipcar was purchased by Avis in 2013. It is important to note that Zipcar is an "asset-heavy" business model as it needs to own the vehicles.

xiv K. Vonnegut. 1952. *Player Piano.* New York: Charles Scribner,.

xv W. H. Davidow and M. S. Malone. 2014. "What Happens to Society When Robots Replace Workers?" *Harvard Business Review*. https://hbr.org/2014/12/what-happens-to-society-when-robots-replace-workers.

xvi E. Brynjolfsson and A. McAfee. 2014. *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, New York: Norton.
xvii See C. B. Frey and M. A. Osborne 2013. The Future of Employment: How Susceptible Are Jobs to Computerization. September 17, 2013. http://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf
xviii From our own research, we would propose that today's home-run firms create far fewer jobs than did GE, GM, Ford in their era. And yet, they are just as organizing of the social world and our thinking of the social world. Google employs fewer folks than Microsoft does and maybe than Microsoft did at a similar stage in its life. However, Google is far more omnipresent than Microsoft ever was.
xix This point was introduced into our debates by Niels Christian Nielsen. He has been persistent in arguing this. See, for example, N. C. Nielsen, J. Murray, and J. Zysman. 2013. *The Algorithmic Revolution and Empowered Human Value Creation*. Danish Technology Institute Rosenthals/Book PartnerMedia.
xx Ibid;
xxi A.M. Turing 1950. Computing machinery and intelligence. *Mind*, 59, 433-460.See also John Searle's Chinese Room discussion. "John Searle in his construction of the Chinese Room problem distinguishes likewise between the imitation of consciousness, in this case capacity to understand and use a language, and the ability to imitate and translate without understanding. See for a simple depiction of the argument: John Searle Continuum Books Joshua Rust 2009 Pages 21-24
xxii Often this will require case study research, and what Richard Nelson has termed "appreciative theorizing." Appreciative theorizing is qualitative in nature as opposed the formal modeling and quantitatively derived theorizing of economics.
xxiii For example, see B. C. Watson. 2013. "Platforms, Productivity, and Politics: Comparative Retail Services in a Digital Age" In *The Third Globalization? Can Wealthy Nations Stay Rich in the Twenty-first Century?* D. Breznitz and J. Zysman (Eds.) Oxford University Press. Or on call centers, R. Batt. 2002. "Managing customer services: Human resource practices, quit rates, and sales growth". *Academy of Management Journal*, 45(3), 587-597. .
xxiv The German studies *Industrie 4.0* and *Smart Services Welt* put a distinct emphasis on existing German strengths and how to preserve them. It has a very different flavor, in our view, from the American discussions.
xxv J. Zysman. 2006. The algorithmic revolution---the fourth service transformation. *Communications of the ACM*. 49 (7).
xxvi Jonathan Murray, Kenji Kushida, and Patrick Scaglia have been essential to our understanding of these issues. See, for example, K. E. Kushida, J. Murray, and J. Zysman. 2011. "Diffusing the Fog: Cloud Computing and Public Policy." *Journal of Industry, Competition and Trade* 11(3):209-237. K. E. Kushida, J. Murray, and J. Zysman. 2012. "The Gathering Storm: Analyzing the Cloud Computing Ecosystem and Implications for Public Policy." *Communications and Strategies* 85: 63-85. K. E. Kushida, J. Murray, and J. Zysman. 2013. "Clouducopia: Into the Era of Abundance." CLSA Blue Book January. K. E. Kushida, J. Murray, and J. Zysman. 2014. The Next Epoch in Cloud Computing: Implications for Integrated Research and Innovation Strategy. BRIE Working Paper. (2014-4). K. E. Kushida, J. Murray, and J. Zysman.

2015. "Cloud Computing: From Scarcity to Abundance." *Journal of Industry, Competition and Trade* 15(1): 5-19.

xxvii M. Hatch. 2014. *The Maker Movement Manifesto: Rules for Innovation in the New World of Crafters, Hackers, and Tinkerers*. New York: McGraw Hill.

xxviii Ibid:

[xxix] Geography is not completely irrelevant. For many functions speed matters; consider the high speed trading activities. Even search benefits from fast responses.

xxx For those interested, we have depicted this transformation in a series of articles: Kushida, Op. Cit.

[xxxi] It is important to note that the fundamental insights regarding the importance of platforms comes from the work by Michael Cusumano and Annabelle Gawer that drew upon the history of the pre-Internet IT firms, Microsoft, Intel, and Cisco. A. Gawer and M. A. Cusumano. 2002. *Platform Leadership: How Intel, Microsoft, and Cisco drive industry innovation*. Boston: Harvard Business School Press. There is now a large and fascinating literature on how firms should develop their platforms.

[xxxii] Gourevitch, Peter uses sectoral analysis in his influential book, *Politics in Hard Times*. Similarly, see R. Rogowski. 1989. *Commerce and Coalitions: How Trade Affects Domestic Political Alignments*. Princeton: Princeton University Press.

[xxxiii] Neff, G. (2012). *Venture Labor: Work and the burden of risk in innovative industries*. Cambridge: MIT Press.

[xxxiv] There are exceptions as Uber and Lyft have quite stringent control over their service providers. Ultimately, the courts may decide that their drivers are, in fact, employees and therefore challenge their current model. See, for example, the recent court ruling in San Francisco that a lawsuit about whether Uber drivers are employees could be tried by a jury (Wilson 2015). The outcome of this lawsuit will have a significant effect on the status of labor in a number of these firms. Wilson, M. 2015. Juries to Decide Whether Uber, Lyft Drivers Are 'Employees'. Findlaw.
March 12, 2015 http://blogs.findlaw.com/in_house/2015/03/juries-to-decide-whether-uber-lyft-drivers-are-employees.html.

[xxxv] It is an interesting question what happens to these "sharing" sites as they grow and the owners receive venture capital and have to monetize their operations in preparation for an exit event.

[xxxvi] N. Fligstein, 1993. *The transformation of corporate control*. Cambridge: Harvard University Press.

[xxxviii] Many have noted that many of the young entrepreneurs that created many of these platforms came from social backgrounds in which their parents were able to support them during their "hacking adventures." If they failed, they could always return to the university. For these entrepreneurs, they were backstopped by family and their social status. This does not diminish their accomplishments, but provides context.

xxxix J. Zysman and A. Newman. 2006. Op Cit: *How Revolutionary Was the Digital Revolution*?

[xl] T. P. Hughes. 1993. *Networks of power: electrification in Western society, 1880-1930*. Baltimore; Johns Hopkins University Press.

[xli] See, for example, B. Latour. 1990. Technology is society made durable. *The Sociological Review*, 38(S1), 103-131.

[xlii] L. Lessig. 1999. *Code and Other Laws of Cyber Space*. New York: Basic Books.
[xliii] Z. Ton, Z. 2014. *The Good Jobs Strategy: How the smartest companies invest in employees to lower costs and boost profits.* Amazon Publishing.