THE GOOD ECONOMY

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"**The future is like a corridor into which we can see only by the light coming from behind**."
—Edward Weyer Jr.

"**The idea that the future is unpredictable is undermined every day by the ease with which the past is explained**."
—Daniel Kahneman

The New Entrepreneurial Economy: A Future History[1]

The twenty years between 2020 and 2040 turned out to be the best twenty-year period of US economic performance since the 1950s, 1960s, and early 1970s.

- Productivity grew at slightly more than 2 percent per year, overall economic growth grew at 3 percent per year, and real per capita growth rose by 2 percent per year.
- Business creation reached its highest levels in decades.
- After continued decline to 2019, labor force participation grew steadily, reaching new highs in the mid-2030s.
- Unemployment, on average, hovered between 5 and 6 percent. Job churn rose to high levels. Self-employment represented the fastest-growing category of employment, reaching 30 percent of the workforce by 2035.
- Federal debt held steady at about 60 percent of gross domestic product, due to entitlement policy reforms (including a higher retirement age) and rapid rates of economic growth.

The nature of work in America changed substantially. Employment grew even as large chunks of the service economy were increasingly automated. Once-synonymous concepts like "work" and "job" became dissociated from each other. American citizens bore more personal responsibility for health insurance and retirement planning.

Indeed, the very language that characterized economic commentary in 2016 had, by 2040, shifted. In addition to "work" and "job," new meanings became attached to words like "career," "wage," "education," "safety net," and "factory." Significant individual adjustments and policy reforms were required, but it was all accomplished without economic or political disaster. This was a marked departure from what many people expected from trends that were evident in 2016.

What happened?

Eight Surprises

[1] A version of this section was also published by the Kauffman Foundation in February 2016.

The economic resurgence that began in 2020 was driven by eight surprises and their consequences.

(1) Technological change continued at a rapid pace and, especially, the implementation and application of new technologies increased.

Technological advances such as cloud computing, mobile applications, nanotechnology, and artificial intelligence—all of which existed in 2016—came together into a new business system, a new platform for economic activity. This enabled significant productivity growth as well as high rates of entrepreneurship.

(2) The importance of scale became inverted in business organizations.

A confluence of economic and social trends—including the new business system and a search for "meaningful" work—finally dealt a blow to command-and-control management structures and the large corporations that housed them. The large numbers of entrepreneurs who were enabled by the cloud and smartphone took apart large, integrated industries such as finance and human resources. The advantages of scale were thus substantially diminished by technology, and the application of artificial intelligence to the law of business organizations further diminished it. Equity markets reinforced this and began to penalize mergers and acquisitions.

(3) The number of "jobs" declined but "work" remained abundant.

While millions of people continued to work in what would still be considered "traditional jobs," millions more put together portfolios of work based on contracts, temporary assignments, and portfolios of skills. The nation stopped seeing W-2 employment as the pinnacle of work, and new employment classifications came into being that legitimized different ways of organizing work to the benefit of employees and employers. Other policy reforms, in response to changing family structure, also buttressed these changes.

(4) New services revolutionized the organization of workers.

Benefits such as health insurance were finally decoupled from employment as more Americans moved into those new working arrangements. This change was also pushed by new companies that appeared in areas like individual marketing, work-life balance, and education and career management. Individuals now have greater responsibility for managing insurance and pensions and balancing family care (children and elderly relatives), but they are not alone in doing so. Organizations that had previously existed—labor unions, consulting firms, temp agencies, and talent agencies—not only adapted but also thrived, and are among the biggest "scale employers."

(5) Two educational revolutions gave another boost to educational attainment.

The democratization of secondary and then postsecondary education in the twentieth century was a major force behind rapid productivity growth and innovation. Those waves hit plateaus in the second decade of this century but, in the 2020s, two new waves of education democratization began to crest. As a result of budgetary pressures and changes in social policy, early childhood

programs and targeted school programs received funding increases. Driven by a variety of motivations, the United States renewed its commitment to developing its children. At the same time, an industry boom in lifelong learning services took off, catering to postsecondary, mid-career, and late-career workers. Labor market demands for continuous skill upgrading drove this, as did an increasing supply of new accreditation and credentialing services.

(6) Political dynamism returned.

In 2020, the federal government ran out of money. Not in absolute terms, of course: massive amounts of revenue were still raised and the government continued to fund entitlement programs. But that year, discretionary spending disappeared: all anticipated federal revenue for the foreseeable future was fully allocated to entitlements and interest payments. Under pressure from China and a stagnant domestic economy, federal lawmakers overhauled taxes, entitlements, and spending. This hastened the decoupling of benefits from employment and reclassification of different forms of employment, and opened the way for devolution of political power to states and cities.

(7) Cities and states became greater forces for policy experimentation and economic progress.

During the 2010s, the realities of knowledge-based work had already underscored the importance of physical proximity, even in an economy dominated by bits and electronic information. Demographic trends—namely, immigration, aging, and the "millennial" generation—continued to sharpen differences between geographic regions. Helped by governance reforms at all levels, cities and states experimented with a host of new policy ideas. Like the new technologies that were transforming their economies, cities became platforms of activity, and a new generation of "comeback cities" contributed to higher levels of growth. State legislatures, prompted by business and resident lobbying, helped loosen land-use restrictions, which unleashed a wave of productive activity in the "old" and "new" economies.

(8) Economic mobility rose; income inequality declined but remained high.

Because of the two educational revolutions, changes in social policy, and changes in employment structures, economic mobility increased. This raised the odds that any given individual, irrespective of birth position, could rise (fall) up (down) the income ladder. One's starting position still influenced the odds of such mobility, but other factors helped make birth less determinative. At the same time, however, some of those same changes in structure and policy meant that the returns to capital and labor still continued to be concentrated near the top of the income distribution.

The word that probably best describes all these changes is *disaggregation*. The twentieth century was the American Century largely because of a continuous process of *aggregation*—over a long period of time, manufacturing and services came to represent a large set of associated functions that were optimized around efficiency and commoditized products.

But that trend reversed itself. Changes in technology and changes in policy unbundled, or took apart, giant swathes of economic activity. Mass specialization, customization, and entrepreneurship became the order of the day.

The overall economy that emerged was very different than the economy we knew in 2016; better than we expected back then, but certainly not perfect. There was more work but not always packaged as "jobs." More mobility, but individual entrepreneurship was required to achieve it. More income, but it was volatile so economic security eroded for many Americans. Yet disaggregation across many areas enabled individuals to take greater control of their economic destinies and adapt, albeit unevenly, to the changes.

This is the story of how we might get there.

Chapter 1: Back to the Future

By the end of the third week of January 2016, there were renewed fears of another American recession. Stocks were down nearly 8 percent since the beginning of the year, fourth-quarter economic data were less than heartening, and China's economic ills were sending fears throughout the world. Already, the United States was five-and- a-half years into an expansion, making it one of the longest since World War II. The fact that for many Americans it hasn't felt like an expansion hasn't helped, and all these developments have led many to expect another recession in the relatively near future.

Another recession is certainly not out of the question, and will happen sooner or later. For many, this will add to their conviction that the remarkable run of American economic growth is over for good. No matter what happens in the next two or three years, we believe there is an optimistic but plausible case for the development of a "good" economic future over the next twenty or thirty years. But that case is very largely missing in the debates and the public imagination about the economy. The purpose of this book is to envision such a scenario and describe the conditions required to realize it.

We came to this purpose in May 2014 when the Roosevelt Institute convened a small conference under the auspices of its Next American Economy initiative.[2] Participants, representing many different organizations and sectors, discussed three different macroeconomic scenarios that could materialize in the United States over the next thirty years. These scenarios were called "Slow and Steady," "The New Feudalism," and "The New Entrepreneurial Economy." At various points during the discussion, survey questions were administered to gather participants' views on the likelihood of these scenarios.

At the beginning of the day, a plurality of respondents voted for the "Slow and Steady" scenario, which anticipates a modestly growing American economy but with the persistence of problems evident today, such as job polarization and inequality. If things played out this way, it would represent a departure from the last century in the United States. Ever since the Great Recession of 2008-09 and the subsequently sluggish recovery, many commentators have talked about the "new normal" or "new mediocre." According to this view, represented by the Slow and Steady scenario, US gross domestic product (GDP) will expand at a very low growth rate over the next quarter century, but it won't feel like growth for most citizens. Overall, the US economy will feel, to put it charitably, mature—you could think of this, too, as the "resignation" scenario. The country is resigned to steady but slow economic growth, with some not-so-great consequences.

Then, over the course of this initial day, participants in the Roosevelt conference alternated making a case for different scenarios—by turns pessimistic, optimistic, and somewhere in between.

By the end of the day, pessimism appeared to be winning out: a plurality of respondents voted for "The New Feudalism" scenario, in which growth and innovation progress at a faster pace than in the Slow and Steady future, but with worsening economic and social effects. Inequality

[2] See here for collected videos and polls: http://nextamericaneconomy.squarespace.com/.

rises steeply, the labor market deteriorates for almost everyone, and economic dynamism steadily diminishes. The country fragments along social, economic, and geographic lines. This scenario roughly resembles that sketched by Tyler Cowen in his book, *Average is Over*, in which the top 20 percent of the country's population thrives in an economy demanding strong IT skills, while the bottom 80 percent without these skills ekes out a living, primarily serving the top 20 percent.

Significantly, the New Entrepreneurial Economy garnered the fewest votes among the three scenarios. In this scenario, productivity grows rapidly, gains are widely shared, and inequality falls because of a strong rise in economic dynamism. This refers to the process of business entry, exit, growth, turnover, and reallocation; a process we will explore further.

The Roosevelt Institute had follow-up meetings on the three scenarios, one in January 2015 and the final one in May 2015. The relative rankings of the scenarios didn't change. The New Entrepreneurial Economy still came in last.

This scenario is the core of what in this book we call the "Good Economy." It is not outlandishly optimistic; nor is it unattainable.

But, listening to the Roosevelt conference participants over the course of these meetings made us realize that, in the public discourse today, the case for an optimistic, yet realistic economic future has not been well made. Instead, there are variations of pessimism and optimism that fall into "hyper" camps.

The hyper pessimists, identified with Northwestern University economist Robert Gordon, posit that the remarkable growth of the twentieth century cannot be repeated.[3] At best, the American economy will grow at a rate between 1 and 2 percent per year—paltry when compared against the historical average of 3 percent per year. In the eyes of the hyper pessimists, today's digital and information technologies will not add up to the impact and benefits of past breakthroughs such as steam power, the internal combustion engine, electricity, and indoor plumbing. The case for extreme pessimism about future economic growth has been strengthened by lackluster economic performance during the past several years even after an extreme amount of monetary liquidity has been pumped into the American economy. If we can't manage to grow in the presence of free money, so the case goes, then something must be fundamentally broken.

At the other end of the spectrum are the hyper optimists, who look at information technology and see unbounded growth (though not necessarily equitable distribution of that growth). According to this view, exponential growth in computing power can't help but generate inexorable technological progress that will transform health, energy, transportation, and pretty much everything else. We have reached the "second half of the chessboard," in the persuasive analogy of Erik Brynjolfsson and Andrew McAfee, authors of *The Second Machine Age*.[4] Leading proponents of the hyper optimistic view—which include Brynjolfsson, McAfee and Peter

[3] Professor Gordon's new book, *The Rise and Fall of American Growth*, was partially funded by the Kauffman Foundation, where two of us have worked.
[4] One of the authors participated in the Roosevelt meetings described previously.

Diamandis, author of *Abundance*—look at the same set of facts today as Professor Gordon, and reach radically different conclusions.

Gordon and other pessimists look around and see an aging population, a decade-long slowdown in productivity, and subpar educational achievement and conclude that the basic drivers of economic growth and standards of living will be nothing but quiescent for the foreseeable future.

Brynjolfsson and McAfee, Diamandis, and other hyper optimists look around and see self-driving cars, rapid advances in robotics, and medical breakthroughs, and conclude that we're on the cusp of an unimaginable golden age. The subtitles of their books speak to this unalloyed optimism: "work, progress, and prosperity in a time of brilliant technologies," and "the future is better than you think."[5]

For historical evidence, hyper optimists point to the transition from an agricultural to industrial economy in the late nineteenth and early twentieth centuries. The United States did not experience mass unemployment then, so why should the transition to an exponential digital economy be any different? The hyper pessimist reply is: why should we expect it to be the same?

In an odd way, it may actually be easier to be either hyper pessimistic or hyper optimistic. Both perspectives rely on extrapolation of current trends. Both make assumptions that are open to challenge. The hyper pessimists appear to assume that humans (or at least Americans) have run out of ideas and we will be unable to repeat past episodes of adaptation. The hyper optimists appear to assume that nothing can impede technological change and that the transition from today to the science fiction future where everything works out fine—growth, opportunity, more equality—will be mostly frictionless.

Our approach in the chapters that follow is inspired by Steven Johnson's notion (adopted from Stuart Kauffman) of the "adjacent possible":

> The adjacent possible is a kind of shadow future, hovering on the edges of the present state of things, a map of all the ways in which the present can reinvent itself. Yet it is not an infinite space, or a totally open playing field. The number of potential first-order reactions is vast, but it is a finite number, and it excludes most of the forms that . . . [currently exist]. What the adjacent possible tells us is that at any moment the world is capable of extraordinary change, but only *certain* change can happen."[6]

Forward progress, as Johnson and Kauffman and others have described it, proceeds not in leaps and bounds but by "one door leading to another door." This is a good metaphor to apply to the American economy and its future. We face a series of doors, each opening to another set of doors. Nobody can predict what the future will look like after a few sets of doors have been

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[5] Erik Brynjolfsson and Andrew McAfee, *The Second Machine Age: work, progress, and prosperity in a time of brilliant technologies* (Norton, 2014); Peter Diamandis, *Abundance: The Future is Better Than You Think* (Free Press, 2012).

[6] Steven Johnson, *Where Good Ideas Come From: The Natural History of Innovation* (Riverhead, 2010), 31 (emphasis original).

opened and passed through. Judging by popular media and the work of the hyper pessimists and optimists, we either face doors that only lead to economic doom, or we're going to jump right past any adjacent possible into an ineluctably rosy future.

We have written this book to focus attention on a different adjacent possible, one between these two extremes that we believe can legitimately be labeled a "Good Economy." It is at hand—we just need to figure out what doors to go through. Which, of course, is easier said than done.

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The Good Economy scenario we describe here was labeled the New Entrepreneurial Economy scenario at the Roosevelt events in recognition of the vital role that entrepreneurs have played in American economic growth generally, and particularly in periods of dynamic, broadly shared growth. We believe that such a scenario can be consistent with other features most people would associate with a Good Economy: steady growth, opportunities for upward mobility across the socioeconomic spectrum, and improvements in living standards.

Actually, for most people, a Good Economy has much more specificity than that—the "felt" experience of economic growth often has little to do with aggregate numbers reported by the Commerce and Labor departments.

Aggregate economic data necessarily gloss over most of the variation that gives the economy its dynamism. Individuals gauge their economic well being by their present state of affairs and the economic trajectory they perceive themselves and those around them to be on. This is determined by an individual's skills, opportunities, and barriers, as well as the performance of specific sectors of the economy for which their skills are best suited and the economic condition of the geographic area in which one resides. And at any one time, of course, there will be certain segments of the population that are doing worse or better than the macroeconomic statistics indicate. Take, for example, the 1950s and 1960s.

These decades still hold totemic importance in contemporary American politics for the left and the right. Economic growth rates were mostly strong in both decades, and they are associated with halcyon days of strong job creation, a "rising tide" for most Americans, and American economic dominance in the global economy. Indeed, judging by the tenor of much economic analysis we've read, our goal as a nation should be to resurrect nearly every single aspect of those decades.

But, while those decades might have been halcyon, they were also quite unusual and cannot be replicated.

To start with, the US economy bestrode the globe in the 1950s and 1960s—accounting for nearly 40 percent of world economic output—in a way that it never will again. Europe and Japan were economically devastated and it took two decades for them to catch back up to the United States. Today, so-called "emerging markets" account for half of world economic output, and political change coupled with free trade has brought billions of people into a widening web of global commerce. On balance, this has been positive for the US economy, and continued globalization

offers even greater benefits for a healthy American economy. Any economic strategy premised on rolling back this progress is pure fantasy.[7]

More importantly, those totemic decades were not high points of inclusion, opportunity, or equity. While the macroeconomic data from that period tell a story of enviable growth for the economy as a whole, one-half of the population—women—was mostly kept out of the labor force. Poverty was persistently high. And minorities, especially African-Americans, were denied full participation in the economic mainstream, an injustice that boiled over during those golden sixties. Women now make up almost half of the American labor force and they outpace men in educational attainment. African-Americans have made considerable progress since the civil rights revolution, even though by many standards the revolution remains dramatically unfinished.

Yet we believe that the United States can once again achieve the rates of economic growth experienced during those years. This time in a globalized world; this time for all our people.

Annual rates of economic growth can again be around 3 percent, with occasional periods even higher. The fruits of that growth can be broadly shared and provide all Americans with a solid shot at upward mobility.

But the Good Economy of the twenty-first century will look and feel much different from the economy many Americans are accustomed to. The nature of work has changed enormously, for example, and will continue to evolve, which includes a changing definition of what a "job" means for many Americans. And the notion of "steady" growth will assume new meaning. If upward mobility increases, that may mean that downward mobility might increase by some degree. Economic dynamism implies change, and change means discomfort for many people. As we heard one elected official quip, "the only thing people hate more than change is the way things are."

In many ways, however, we have no choice but to embrace and actively work toward realizing the Good Economy scenario we outline here. Many of the most significant challenges facing the United States and other countries today—high public debt, climate change, inequality, and so on—can only be addressed with an economy growing at much faster rates.

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There is, of course, no shortage of efforts to rebalance or realign or rewrite or re-fill-in-the-blank the US economy. A standard approach is to develop a list of policy prescriptions that would presumably remake the American economy, and then hope that by the power of persuasion the political gridlock in Washington can be broken. "If only Washington could see the light, we'd be able to overhaul the economy."

[7] The French refer to "Les Trente Glorieuses," which refers to the three decades of rapid economic growth from the end of World War II to the mid-1970s.

We try a different approach here. Why not imagine first what a Good Economy—a realistically more optimistic future than the conventional wisdom now projects—actually would look like over the next quarter century, with the intention of at least getting a wide number of people to agree on some desirable outcomes? Imagination can be powerful, the equivalent of an athlete envisioning how he or she is going to perform before going out and actually realizing that vision. Imagination also can facilitate agreement in the beginning on ends, and then foster a desire to meet part way to agree on means.

We believe that political debates are likely to be much more civil and constructive (or at the minimum more so than the debates of the last fifteen years), if all participants start first by discussing and even trying to agree on outcomes.

The Good Economy presented in this book has both incremental and radical features. It is incremental in the sense that it is consistent with major trends underway today. But it is also radical because some of what it will take to get from here to there represents significant changes in policies and trends from those prevailing today.

We believe we have a choice: it is within Americans' power to choose which future scenario they would like to build, and make the decisions necessary to realize it.

In the next chapter, we discuss the dark side of the adjacent possible, and explore the "bad doors" that are currently open to a pessimistic future. Even well short of hyper pessimism, there is in fact a very realistic and plausible case to be made for dismal economic future.

Subsequent chapters discuss economic growth itself and how it happens, and then describe the micro-structure of the Good Economy, as well as the set of open "good doors" that we must try to go through. We also explore some implications of the Good Economy, including some big issues that must be addressed satisfactorily if the Good Economy is to be realized. In other words, how do we open the doors to the Good Economy?

We conclude with some thoughts about the nature of the transition from the relatively sluggish economy of today and the past few years to the Good Economy of tomorrow. Realizing that favorable outcome, we believe, will be easier if American citizens and their public and private policymakers have a vision of what it looks like and what changes are necessary to make it happen. Our book is written to assist all those who agree with this objective.

Chapter 2: The Very Real Case for Pessimism

What could go wrong on the way to the Good Economy? Well, plenty. According to some, many of today's economic shortcomings will continue to worsen and obstruct future growth. These are not harebrained eschatologists. Many clear-eyed analysts look at past history and current trends and conclude, not unreasonably, that we can put away the shades because the future's not so bright, after all.

In one sense, this is not surprising. The Great Recession that officially lasted from December 2007 to June 2009 blew a giant hole in the American economic trajectory. Estimates of "potential output growth" from the International Monetary Fund (IMF) are now significantly lower than just a decade ago. As a result, the IMF has sliced its short-term growth forecasts for the United States. Worse, other institutions have been lowering their long-term growth forecasts. The Federal Reserve, Congressional Budget Office, and others now expect the US economy to expand by roughly 2 percent per year over the next few decades. Keep in mind that, for about two centuries, American economic growth has averaged about 3 percent per year.

We shouldn't necessarily put a lot of stock in such forecasts, but the trend—toward lower expected growth, almost a resigned pessimism—is hard to ignore. Several new phrases have entered the American lexicon over the past few years: "secular stagnation," "a slow-growth new normal," "stall speed growth," "new neutral," "two-speed economy," and so on. Those don't exactly scream optimism.

But one doesn't need to believe economic forecasts to perceive a deep sense of economic unease in the United States today. According to polls, the notion of stagnation has now become widespread. At the end of 2015, an average of seven different polls found that only one-quarter of Americans thought the country was on the "right track." Nearly two-thirds said the country was on the "wrong track," though this was lower than the high of three-quarters that these polls reached in the autumns of 2011 and 2013.[8] Still, the "right track" answer had mustered more than 40 percent only once since 2009. And this during a so-called economic "recovery"!

And it's no wonder. In July 2015, the Commerce Department reported that the already not-so-great expansion was even more subpar than originally thought. The Bureau of Economic Analysis, a unit within Commerce, released revised GDP numbers going back to 2011, with the result being that the size and pace of economic growth for most of the "expansion" were actually lower than previously estimated. This prompted the *New York Times* to dub it the "ho-hum economy," while the *Wall Street Journal* called it the "six-year slough."[9]

Yet in another sense, we've seen all this before, haven't we? Sentiment about the American future moves in cycles of hubris and doom. Anyone who lived through the 1970s will tell you that today's pessimism comes nowhere close to that decade's "malaise." That was followed, of course, by "morning in America" in the 1980s, anxiety about Japanese domination in the 1980s

[8] *See* http://www.realclearpolitics.com/epolls/other/direction_of_country-902.html.
[9] Editorial, "The Ho-Hum Economy," *New York Times*, August 2, 2015, ; Editorial, "The Six-Year Slough," *Wall Street Journal*, July 31, 2015.

and 1990s, and the unipolar moment of the 1990s. Today's declinist spasm, then, is just another ebb in the cycle. We are told that the United States is too old and mature, that the American Century will inexorably give way to the Chinese Century, if it hasn't already. The United States doesn't make things anymore, has forgotten how to make things, even. All the good jobs are gone, destroyed by technology or outsourced to foreign countries. The middle class has been "unwound," and we're on our way to an economy of a few elites and a mass of serf-like service workers. Mass technological unemployment is right around the corner, and our irretrievably failing educational system can do nothing to stop it. … The litany of decline can be spun out indefinitely.

Are such concerns overwrought? Sometimes, but there are several reasons for taking the pessimistic case very seriously. These, in one sense, represent doors we all wish would stay closed.

The so-called "recovery" from the Great Recession has been agonizingly slow and desultory. While monthly job growth has been relatively steady for the last four years, it took six years to recover all the jobs lost during the recession. The unemployment rate has fallen steadily, but a high percentage of Americans remain underemployed, and long-term unemployment remains an unacceptably large component of unemployment. Meanwhile, other employment measures have been worryingly flat. The labor force participation rate has fallen steadily since the early 2000s, and fell especially steeply during the recession and recovery. Economists have concluded that most of this fall is due to an uptick in retirements and more Americans claiming disability. A non-trivial portion, however, is also due to completely discouraged workers, and many of those entering retirement have done so prematurely because of a poor labor market.[10]

Even the types of jobs that have been created during the past several years appear to be cause for concern. What economists call "job polarization" appears to now be a feature of the US economy, with fewer middle-income jobs being produced, and many more low-income jobs generated. Polarization, of course, implies two ends of a spectrum, and researchers have found that relatively more high-income jobs are also being produced, though at a slower pace than in the past.[11]

Short-term trends may not justify pessimism if they remain just that: short-term. A sluggish recovery from the Great Recession was partly expected because it stemmed from a financial crisis, and it takes longer to bounce back from a financial crisis than an "ordinary" recession.[12] And job polarization trends could be discounted if put into a context of broadly shared gains.[13] But, there are serious concerns about the ability of the US economy to generate innovation and

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[10] *See, e.g.*, Shigeru Fujita, "On the Causes of Declines in the Labor Force Participation Rate," Federal Reserve Bank of Philadelphia, February 2014, *at* file:///Users/dstangler/Downloads/on-the-causes-of-declines-in-the-labor-force-participation-rate%20(4).pdf.

[11] David H. Autor, "Why Are There Still So Many Jobs? The History and Future of Workplace Automation," *Journal of Economic Perspectives*, Summer 2015.

[12] Carmen M. Reinhardt and Kenneth S. Rogoff, *This Time is Different: Eight Centuries of Financial Folly* (Princeton, 2009).

[13] Stephen J. Rose, "Was JFK Wrong? Does Rising Productivity No Longer Lead to Substantial Middle Class Income Gains?" Information Technology and Innovation Foundation, December 2014.

growth over the next few decades. Some observers, like John Fernald at the San Francisco Federal Reserve, project a return to the relatively steady but flat productivity growth that the United States experienced from the early 1970s to the mid-1990s.[14] We experienced a surge of productivity growth in the late 1990s and early 2000s but, according to Fernald, that largely reflected the initial burst of information technology production and application, a burst that has now at least paused, if not ended.

Economist Robert Gordon has made the most rigorous and persuasive case for pessimism.[15] For Gordon, the United States faces six "headwinds," or obstacles that will hamper growth. These are:

- *Demographics*—mainly because of an aging population. Gordon projects that Americans will steadily work fewer hours per week, and that population aging will further drive down labor force participation. Part-time work will rise.
- *Education*—the twentieth century was the human capital century, with economic growth driven by rising high school graduation and then mass college attendance. But, Gordon foresees a slowdown in educational attainment, which will reduce productivity growth.
- *Inequality*—according to Gordon, income inequality will not get any better, and will actually become a drag on income growth for 99 percent of the population.
- *Fiscal solvency*—the financial health of the federal government has been much discussed (and much fought over) the past few years, and many cities and states also struggle with the fiscal demands of pensions and health-care costs, with no alleviation in sight. The problems are most apparent at the federal level, and without major changes to federal entitlement programs or substantial tax increases—or both—the long-run trajectory of the federal budget is simply unsustainable. These will reduce growth because they will compel government to raise taxes and divert income.
- *Globalization*—rising wages in the rest of the world, a happy consequence for other countries, will necessarily lead to lower wages for American workers.
- *Energy and environment*—in Gordon's view, addressing the challenges of climate change and energy sources will divert investment dollars and creative energy away from innovation toward mere energy efficiency. This will further reduce growth.

When Gordon adds all this up—or, rather, subtracts it all from our historical rate of growth—the results aren't heartening. He forecasts real economic growth of only 2 percent per year for the next twenty-five years, with productivity growth of 1.3 percent, 0.9 percent annual growth in per capita GDP, and only 0.4 percent annual growth in real income per capita for 99 percent of the population. What these numbers mean in terms of actual lived experience accords with the

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[14] John Fernald and Bing Wang, "The Recent Rise and Fall of Rapid Productivity Growth," Federal Reserve Bank of San Francisco, Economic Letter, February 9, 2015.

[15] *See* Robert J. Gordon, "Is U.S. Economic Growth Over? Faltering Innovation Confronts the Six Headwinds," National Bureau of Economic Research, Working Paper 18315, August 2012, http://www.nber.org/papers/w18315.pdf; Robert J. Gordon, "The Demise of U.S. Economic Growth: Restatement, Rebuttal, and Reflections," National Bureau of Economic Research, Working Paper 19895, February 2014, http://www.nber.org/papers/w19895.

phrases we listed above: stagnation, slow growth, stalled, etc. Our linguistic descriptions, it appears, reinforce the case for long-term pessimism.

As if these headwinds were not reason enough for gloom, Gordon points to another, larger challenge: a reduction in the ability of the United States to innovate. There will be no potential "savior" of economic growth to buffer the effects of the headwinds because the information technology revolution pales in comparison to prior waves of innovation. The first Industrial Revolution, driven by steam engines and railroads, and the second industrial revolution, with electricity, plumbing, and the telephone, completely transformed life for most people. Computers and the Internet have been important, says Gordon, but lack the transformative punch of the first two industrial revolutions. This means most Americans face "an epochal decline from the US record of the last 150 years." Even those observers who are slightly more optimistic than Gordon and expect the American economy to grow at higher rates still project an increasingly bifurcated economy in which an economic elite "wins" and living standards mostly stagnate for everyone else.[16]

We disagree. For reasons articulated above and explored below, this kind of growth accounting does not tell us much about growth.[17] There is an alternative economic narrative to Gordon's that holds much greater hope for renewing economic dynamism and setting America once again on the path to the Good Economy. We're not suggesting, for example, that population aging will suddenly reverse itself, or that climate change will simply disappear. Instead we argue that the context, the setting for these challenges and others, will improve.

We believe there is another set of doors—another adjacent possible—through which the economy could proceed. We need the willingness to visualize this alternative future, and the willingness to take the necessary actions to open some doors and close others, to at least raise the probabilities that this more optimistic adjacent possible will develop.

[16] Tyler Cowen, *Average is Over: Powering America Beyond the Age of the Great Stagnation* (Dutton, 2013).
[17] Others contend that Gordon's statistical premises are flawed, particularly the reliance on standard productivity measures. *See* Amar Bhidé, "The Demise of US Dynamism is Vastly Exaggerated—But Not All is Well," Working Paper, Center on Capitalism and Society, Columbia University, January 2015, http://capitalism.columbia.edu/files/ccs/workingpage/2015/amar_bhide_working_paper_84_demise_of_dynamism.pdf.

Chapter 3: Growth Theory for the Good Economy

Preserving a good, free, democratic, equitable society requires an economy growing at a healthy rate. If Gordon's formidable and disturbing analysis proves to be correct, we are unlikely to see that flourishing society. Significantly, our economic growth over the last few decades has been relatively mediocre. And we have seen disturbing trends in our society, our politics, and our governance, accompanying lower growth.

In this chapter, we argue that economic growth in the Good Economy can be substantial ("can" is not the same as "will"), and that the "Gordonian" future is not inevitable. We make this argument by considering the following sub-topics: Why does growth matter? What do we mean and what we do not mean when thinking about growth? After these brief discussions, the centerpiece of this chapter is a discussion of the nature and the true sources of growth.

The core of our argument will be that the explosive long-term growth that has marked the last 200 years for the United States (and a number of other countries) is not at all the kind of growth that is obsessed over in our media and our politics. In particular, we distinguish between *growth of the economic frontier*—of the fundamental capacity of our economy—and *static improvements in efficiency*—growth within the economic frontier at any given time. The former is more important over the long run than the latter, and that too often those who focus on growth, even those who unabashedly champion it, fail to see this.

But what generally is the Good Economy? And what seems to be happening now?

Markers of the Good Economy

Most Americans would define a "Good Economy" as one that generates sufficient numbers of new jobs for those who want to change jobs as well as for those who are just entering or re-entering the labor force; jobs with incomes allowing most people to move up, to improve on their parents' lot in life; and jobs that people find personally rewarding that also provide reasonable compensation growth. Most Americans might also include a sense of economic fairness, equity, and mobility in their definition.

It should be patently obvious that these outcomes cannot be accomplished in the economic future implied by Robert Gordon's work. Achieving these "good" outcomes requires high levels of economic dynamism, high rates of economic mobility, and open opportunity. And these features in turn arise from a strong pace of economic growth. Gordon's projections of a 0.4 percent annual increase in income for most households implies a doubling of income every 174 years, hardly the kind of forecast that inspires any optimism, and certainly one inconsistent with anyone's definition of the Good Economy.

Economic growth is not just about the money. It matters for non-material reasons, "moral consequences," in the language invoked by Harvard economist Benjamin Friedman:

> Economic growth—meaning a rising standard of living for the clear majority of citizens—more often than not fosters greater opportunity, tolerance of diversity, social

> mobility, commitment to fairness, and dedication to democracy. Ever since the Enlightenment, Western thinking has regarded each of these tendencies positively, and in explicitly moral terms.[18]

Continuation of that growth is, in Friedman's eyes, "the central economic question" for the United States.

> Even in America, I believe, the quality of our democracy—more fundamentally, the moral character of American society—is similarly at risk. The central economic question for the United States at the outset of the twenty-first century is whether the nation in the generation ahead will again achieve increasing prosperity, as in the decades immediately following World War II.[19]

In other words, growth is essential for progress of all kinds, including in the "quality of our democracy" and "the moral character of American society." Simply, the Good Economy is one with reasonably high levels of growth. Of course, how the benefits of that growth are distributed is also of critical importance, as recent political discourse in both parties has highlighted. We will get to that important topic shortly. But before we can even talk about how the economic pie is carved up, we must be sure that it is growing.

A Particular Kind of Growth

Gross domestic product, inflation, unemployment, and consumer spending—the blizzard of monthly indicators published by the federal government and other sources—are what most of us associate with the economy. Likewise, when we talk about economic *growth*, we typically use data such as the quarterly or annual percentage change in GDP or the change in per capita income and so on as signs of economic improvement or worsening.

Very few of these indicators, however, tell us *how* or *why* economic growth happens. They can describe the ticker-tape tale of the economy, but won't reveal what actually happened in the economy itself to produce those numbers.

To get at what is actually happening we want to return to the distinction we have already underlined: between moving *to the frontier* and *moving the frontier* outward. We want to be clear that as we discuss growth over the long run, we are concentrating on *growth that moves the frontier.*

Economists refer to the *frontier* or the *production possibilities frontier* to mean the upper limit of the goods and services (the GDP) an economy can produce given current technologies and resources (or "factors of production" as economists like to call them, the combination of human and physical capital in the economy). The United States, for example, is usually taken to be today's "frontier economy." In the nineteenth century, Great Britain represented the frontier and much of the growth that America experienced then was "catch-up" growth, as the US economy caught up to best technology on the other side of the Atlantic. During the twentieth century,

[18] Benjamin M. Friedman, *The Moral Consequences of Economic Growth* (Vintage, 2005), 2.
[19] Friedman, *The Moral Consequences of Economic Growth*, 3.

countries from Japan to South Korea and Taiwan experienced rapid catch-up growth—over the last thirty years, China has best exemplified movement toward the frontier.

At the frontier, economists then often talk about static efficiency: namely, how to maximize the allocation of resources at a given point in time, given available technology. Many economic policies—such as deregulation of prices and entry in industries where competition can thrive — are designed to achieve static efficiency. But making the most out of any given amount of labor and capital *at the frontier* is not the same as achieving *sustained growth or expansion of the frontier itself.*

In fact, as Professor William Baumol has estimated, the movement of the frontier outward brings benefits orders of magnitude larger than movement along the frontier: analyzing the last one hundred years of American growth in per capita income, he finds that all of the improvements in static efficiency added up year by year would sum to about $5,000 per person over a century, a figure that pales compared to the benefits of growth, which would sum to about $1.5 million per person.[20] Or, put another way, economic historian Deirdre McCloskey has quantified the magnitude of growth in rather stark terms: "In 1800 the average human consumed and expected her children and grandchildren and great-grandchildren to go on consuming a mere $3 a day. … Nowadays, you probably spend about $100 a day."[21]

Understanding the distinction between movements along the frontier and outward shifts of the frontier itself, however, does not tell us *how* the frontier expands. The story of economic growth is typically told in terms of technology, geography, law, and so on—all important, to be sure, but the unprecedented takeoff in wealth and growth that began around 1800 did not in large measure occur because of the accretion of inputs, by which we mean more people, even more educated ones, and more machines and buildings. Growth has been generated most by improvements in *technology,* or continued innovation. Furthermore, and here we draw on the work of several scholars, frontier-expanding economic growth also originated in such ineffable sources as a shift in language, a specific social environment, the proper channeling of entrepreneurs, and a division of labor between large and small companies.

Yale Professor William Nordhaus has shown the difficulty, for example, in using traditional measures of economic output to track innovation. It's one thing to say that wages or output have grown by X percent per year for a sustained period of time. But they have limitations: "the essential difficulty arises for the obvious but overlooked reason that most of the goods we consume today were not produced a century ago."[22] The invention and spread of automobiles, the rise of the personal computer, progress in medical treatment, the diffusion of air conditioning—these are what push the frontier outward, and these are what we cannot easily capture through conventional data and static efficiency analysis.[23]

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[20] William J. Baumol, *The Microtheory of Innovative Entrepreneurship* (Princeton, 2010), 4.
[21] Deirdre N. McCloskey, *Bourgeois Dignity: Why Economics Can't Explain the Modern World* (Chicago, 2010), 1.
[22] William D. Nordhaus, "Do Real-Output and Real-Wage Measures Capture Reality? The History of Lighting Suggests Not," in Timothy F. Bresnahan and Robert J. Gordon, *The Economics of New Goods* (Chicago, 1996).
[23] William D. Nordhaus, "Do Real-Output and Real-Wage Measures Capture Reality? The History of Lighting Suggests Not," in Timothy F. Bresnahan and Robert J. Gordon, *The Economics of New Goods* (Chicago, 1996).

The way many of us talk about growth also hinders our understanding of it. Few people make the moral case for economic growth anymore. And almost no one thinks in terms of the economic development of America. Instead, the case for economic improvement is made in instrumental terms. How will we create jobs for everyone? How will we pay for all these entitlements we've promised everyone? Instrumental questions are good questions. But when we frame growth exclusively that way, it is inevitably perceived to be basically about numbers and an incremental, steady phenomenon, which just requires sound management through monetary and fiscal policy.[24]

As an example, consider the last thirty years. For a quarter-century, from 1983 through 2007, the United States experienced a sustained period that has come to be called the "Great Moderation." With the exception of two mild recessions, the country enjoyed steady growth, low inflation, and a rising standard of living. Credit for this achievement has typically gone to the Federal Reserve for its management of the money supply and interest rates. Yet this same period also witnessed the explosion of information technology and its diffusion throughout the entire economy, driving massive productivity gains in nearly every sector. The Fed, wonderful as it is, had nothing whatsoever to do with this tumultuous change, which is really how innovation and expansion of the frontier really comes about—in fits and starts, often with much disruption.

In short, growth is not about steady or constant accumulation of capital or knowledge resulting in the smooth expansion of gross domestic product. It is a chaotic, jumbled broad process that cannot be explained or predicted by reference to changes of a few tenths of a percentage point in a single productivity measure.

To give another example, as this chapter is being written, obsessive attention is being given and more will be given to how rapidly the Federal Reserve will raise short-term interest rates now that it has finally jumped off zero in December 2015. The pace of future increases may be quick, or it may be slow. One thing is clear: a gradual schedule of quarter-point increases will add little or nothing to America's long run rate of economic growth.

What worries us most is what economist John Haltiwanger and others have found about the US economy: that economic dynamism has fallen steadily in the United States since the 1980s, a change which if true has profound implications for growth and mobility. "Economic dynamism" is the term used by economists to refer to the collective process of business entry and exit, firm growth and shrinkage, and the movement of workers between jobs. This process, which can also be called "churn," is what drives productivity, wage growth, and job creation. And, unfortunately, the US economy appears to have grown less dynamic, particularly since 2000.[25]

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[24] On this point, in fact, we agree with Professor Gordon, who argues against the idea of economic growth as a "steady process that creates economic advance at a regular pace." Robert J. Gordon, *The Rise and Fall of American Growth* (Princeton, 2016), 2.

[25] Steven J. Davis and John Haltiwanger, "Labor Market Fluidity and Economic Performance," National Bureau of Economic Research Working Paper 20479, September 2014, http://www.nber.org/papers/w20479. See also Ian Hathaway and Robert E. Litan (2014), "A Less Dynamic Economy: What's Going On?" Third Way, March 10, 2014 (with Ian Hathaway), http://www.thirdway.org/report/a-less-dynamic-american-economy-whats-going-on.

One dimension of economic dynamism is worker reallocation: this is the pace at which workers change jobs. This type of movement enables wage growth and career advancement as workers move up the ladder and find better matches. Another dimension is job reallocation: when high-performing businesses expand and low-performing businesses shrink, jobs are thus reallocated from the latter to the former. This drives overall productivity growth. Faster job reallocation also helps improve labor market outcomes, especially for those at the margins of the labor force.

Both types of reallocation, however, have been falling since the 1980s, and that decline accelerated after the year 2000.[26] These declines have hurt wage growth, job creation, and productivity—one estimate suggests that the US economy is today getting one percentage point *less* productivity growth from reallocation than in the 1980s.[27] That is a very significant difference. Falling economic dynamism partly helps explain sustained declines in the labor force participation rate and employment-population ratio. The labor force participation rate is five percentage points lower today than at its peak in 2000, and is at its lowest level since 1977.[28] The employment-population ratio, meanwhile, is also five percentage points lower than in 2000, and is at its lowest point since 1984. If workers do not move around at the same pace looking for new opportunities, and if jobs do not shift to more productive firms, there are fewer labor market entry points. The harm has been worse for young workers and men with low levels of education—the long-term effects of declining economic dynamism could soon begin to show up in lower rates of economic mobility.

So, in considering America's economic growth, the task must be to figure out how the economic frontier can keep expanding; how economic dynamism happens; how great leaps in living standards can happen. For insight into this type of economic growth, we turn to a set of observations from several different economists whose work stands apart from what masquerades as growth policy in Washington.

Growth Theory for the Good Economy

By any measure, the rise in living standards over the past two centuries has been mind-boggling. From afar, economic history "has looked like an ice-hockey stick lying on the ground. It had a long, long horizontal handle at $3 a day extending through the two-hundred-thousand-year history of Homo sapiens to 1800, with little bumps upward on the handle in ancient Rome and the early medieval Arab world and high medieval Europe." Then, suddenly, that horizontal handle became "a wholly unexpected blade, leaping up in the last two out of the two thousand centuries."[29]

The pace of progress has also not waned, accelerating after 1900 compared to the already-rapid pace of the 1800s. In 1900, it took 101 minutes of work for an American worker to afford three pounds of tomatoes; by the end of the century, it required only eighteen minutes of work. It took

[26] John Haltiwanger, "Top Ten Signs of Declining Business Dynamism and Entrepreneurship in the U.S.," Paper prepared for Kauffman Foundation New Entrepreneurial Growth conference, June 2015.
[27] Ryan Decker, John Haltiwanger, Ron Jarmin, and Javier Miranda, "The Secular Decline in Dynamism in the U.S.," mimeo, 2014.
[28] See Federal Reserve Economic Data (FRED), Federal Reserve Bank of St. Louis, *at* https://research.stlouisfed.org/fred2/.
[29] Deirdre N. McCloskey, *Bourgeois Dignity: Why Economics Can't Explain the Modern World* (Chicago, 2010), 2.

eighty minutes of work in 1900 to afford a dozen eggs; a century later, only five minutes.[30] Keeping a 100-watt light bulb on today for three hours per night for a year produces 1.5 million lumen-hours of light, and it takes the average worker only a few minutes of labor to earn that illumination. One hundred years ago, getting that much light "would have required burning seventeen thousand candles, and the average worker would have had to toil almost one thousand hours to earn the dollars to buy the candles."[31]

Why and how did the economic frontier expand at such an unprecedented pace?

In the midst of this transformation, two economists noticed that something new was happening. In 1879, Alfred Marshall published *The Economics of Industry*, his first book. Considered by many to be the father of modern analytic economics, Marshall conducted an intense study of English factories to figure out how productivity grew and wages rose. This was a marked contrast to his predecessors: "The chief fault in English economists at the beginning of the century was not that they ignored history and statistics. … But their most vital fault was that they did not see how liable to change are the habits and institutions of industry."[32] Marshall put the business enterprise, particularly its need "to evolve in order to survive," at the center of explaining innovation and growth. It was an ongoing discovery process: "The constant search to find efficiency gains … multiplied over hundreds of thousands of enterprises throughout the economy … over time raised average productivity and wages."[33]

Over thirty years later, Joseph Schumpeter took Marshall's observations several steps further and put the entrepreneur—the person who initiates the enterprise—front and center in explaining the process of discontinuous change that characterizes frontier-expanding growth.[34] For Schumpeter, economic growth could be explained not by the accretion of more of the same inputs, but by what later economists would call better "recipes": "Add successively as many mail coaches as you please, you will never get a railway thereby … the essence of economic development consists in a different employment of existing services of labor and land."[35] This economic function was not abstract or magical, but was carried out by individuals, by entrepreneurs.[36]

Marshall and Schumpeter made important breakthroughs in understanding why, in contrast to previous centuries, the economic frontier was rapidly expanding around them. But their insights also pushed the question further back: if the activities of the entrepreneur and the entrepreneur's

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[30] "Time Well Spent: The Declining *Real* Cost of Living in America," Federal Reserve Bank of Dallas, Annual Report, 1997, http://www.dallasfed.org/assets/documents/fed/annual/1999/ar97.pdf.
[31] William D. Nordhaus, "Do Real-Output and Real-Wage Measures Capture Reality? The History of Lighting Suggests Not," in Timothy F. Bresnahan and Robert J. Gordon, *The Economics of New Goods* (Chicago, 1996).
[32] Sylvia Nasar, *Grand Pursuit: The Story of Economic Genius* (Simon & Schuster, 2011), 84.
[33] Nasar, *Grand Pursuit: The Story of Economic Genius*,84.
[34] Nasar points out that Schumpeter actually spoke to Marshall about his developing interest in how economic growth, or what Schumpeter called "economic development," occurred. *See also* Thomas K. McCraw, *Prophet of Innovation: Joseph Schumpeter and Creative Destruction* (Belknap, 2007).
[35] Nasar, *Grand Pursuit: The Story of Economic Genius,* 190.
[36] Nearly a century later, Daniel Spulber put the entrepreneur at the center of his mathematically formulated theory of the firm, with firm creation as the centerpiece of economic activity. Daniel F. Spulber, *The Theory of the Firm: Microeconomics with Endogenous Entrepreneurs, Firms, Markets, and Organizations* (Cambridge, 2007).

creation, the firm, were central to understanding growth, then why did growth suddenly take off in the nineteenth century and not before? What had prevented its prior emergence?

The answer was not that there had been no entrepreneurs before the 1800s: entrepreneurs of one kind or another have existed in every civilization.[37] But the environment in which entrepreneurs operate determines, in William Baumol's typology, whether their activities will be "productive, unproductive, or destructive."[38] Something must explain a change in the environment that permitted entrepreneurial activity to morph into a productive process of innovation, discontinuous change, and frontier-expanding growth. For this explanation, we turn to three economists whose work is relevant to not only historical understanding but also contemporary analysis. The insights of McCloskey, Edmund Phelps, and Baumol are the foundation of our case for the good economy today and the economic growth it will require. Their work forces us to ask different kinds of questions about today's economy.

Their explanations for why the trajectory of economic growth turned sharply upward—McCloskey's horizontal hockey sticks—are not exactly obvious, and do not fit neatly with technical or technocratic approaches to growth.

McCloskey locates her explanation in language and thought, arguing that innovation caused the Industrial Revolution—a contention that is not controversial—and that "talk and ethics and ideas caused the innovation."[39] Economic factors were important: coal, trade, printing, financial innovation, and so on. But none, says McCloskey, drove the "inexplicable" leaping out of the frontier. Ideas, however, can explain it:

> In particular, three centuries ago in places like Holland and England, the talk and thought about the middle class began to alter. Ordinary conversation about innovation and markets became more approving. … The North Sea talk at length radically altered the local economy and politics and rhetoric. In northwestern Europe around 1700 the general opinion shifted in favor of the bourgeoisie, and especially in favor of its marketing and innovating. … People stopped sneering at market innovativeness and other bourgeois virtues.[40]

It was speech, then, "not material changes in foreign trade or domestic investment," that caused the radical shift. And not just idle chatter about markets and new ideas, but speech and thought about "dignity" and "liberty."[41] A new dignity was accorded to the bourgeoisie and the freedom to venture forth. Dignity made the activities of the bourgeoisie honorable and acceptable; liberty

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[37] David Landes, Joel Mokyr, William J. Baumol, *The Invention of Enterprise: Entrepreneurship from Ancient Mesopotamia to Modern Times* (Princeton, 2010).
[38] William J. Baumol, "Entrepreneurship: Productive, Unproductive, and Destructive," *Journal of Political Economy*, 1990.
[39] McCloskey, *Bourgeois Dignity*, 6.
[40] McCloskey, *Bourgeois Dignity,* 7.
[41] McCloskey, *Bourgeois Dignity,*at 9. The venue for such talk also mattered. A good case can be made for the prominence of coffee and coffeehouses in nurturing the processes described by McCloskey. *See* Steven Johnson, *The Invention of Air* (Riverhead, 2008), and *Where Good Ideas Come From* (Riverhead, 2010).

allowed their innovations to find a market—to prevail often enough against the arrayed forces of the status quo and its incumbents. Both were necessary for modern economic growth.

Unleashed, dignity and liberty gave rise to a vast laboratory in which thousands and thousands of economic experiments could take place. The result was the vertical leap of the hockey stick blade —"astounding, unprecedented, unexpected, the greatest surprise in economic history."[42]

That experimental laboratory needed more than casual conversations about dignity and liberty to generate a continuous process of innovation. It also required something systematic, what Edmund Phelps calls an "imaginarium—a space for imagining new products and methods, imagining how they might be made, imagining how they might be used."[43] That space, undergirded by dignity and liberty, creates economic dynamism.

> We must also understand the concept of an economy's dynamism. It is a compound of the deep-set forces and facilities behind innovation: the drive to change things, the talent for it, and the receptivity to new things, as well as the enabling institutions. Thus dynamism, as it is used here, is the willingness and capacity to innovate, leaving aside current conditions and obstacles. … The advent of the modern economy brought a metamorphosis: a modern economy turns people who are close to the economy, where they are apt to be struck by new commercial ideas, into the investigators and experimenters who manage the innovation process from development and, in many cases, adoption as well. … New business ideas come only to those who have been observing at close hand some area of a business, learning things about how it works and giving some thought to the possible size of the market for a new sort of product in that area or to the prospect for a better method of production; plausible business ideas rarely come to those remote from any business.[44]

This is more than a distributed process of experimentation; it is an entire system.

> The explosions of economic knowledge in the 19th century must be the effect of the emergence of an entirely new kind of economy: a system for the generation of endogenous innovation decade after decade as long as the system continues to function. Only the structuring of these economies for the exercise of indigenous creativity and pathways from there to innovation—for what has come to be called "indigenous innovation"—could have put these nations on steep paths of sustained growth.[45]

This system, fueled by ideas of dignity and talk of liberty, characterized by discovery and the drive for improvement, eventually evolved a distinct division of labor that sustains the "generation of endogenous innovation" over time. This is what Baumol calls the "innovation industry," and he identifies two complementary mechanisms of innovation. First, "smaller firms

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[42] McCloskey, *Bourgeois Dignity,* 49.
[43] Edmund S. Phelps, *Mass Flourishing: How Grassroots Innovation Created Jobs, Challenge, and Change* (Princeton, 2013), 27.
[44] Phelps, *Mass Flourishing* 2, 9.
[45] Phelps, *Mass Flourishing,*14.

are responsible for a disproportionate share of the breakthrough inventions." Second, their larger, more established counterparts "specialize in incrementally improving the most promising of the radical innovations."[46] The large firm uses innovation as a crucial means of competition and is driven by the innovation of other large firms into a kind of innovation arms race. Large firms spend most of the United States' research and development (R&D) dollars but in order to reduce risks they operate bureaucratically and conservatively.

On the other hand, small, entrepreneurial firms work in a much more free-wheeling and imaginative way, take much higher risks (with higher risks of failure), and produce far more revolutionary breakthroughs:

> A substantial proportion of the revolutionary new ideas of the past two centuries have been and likely will continue to be provided by independent, innovative entrepreneurs operating small business enterprises. Evidently, small entrepreneurial firms have come close to monopolizing the portion of R&D activity that is engaged in the search for revolutionary breakthroughs.[47]

This interactive dynamic helps sustain dynamism and innovation.[48] And it is this built-in dynamism and innovation—built into how the system works at its core—that is for Baumol, Phelps, and McCloskey the true source of growth.

As these lines of thinking suggest, there is a tradition of thought, a set of well-developed hypotheses about economic growth, that is quite different from and out of fashion with mainstream economics. This tradition argues that the causes and drivers of economic growth are very different than mechanistic growth accounting would suggest.

In contrast, mainstream economics assumes, implicitly, that economic growth is a steady incremental process occurring in a relatively unchanging economic system and best analyzed through growth accounting by adding and subtracting tenths of points of various kinds of productivity.

We do not believe this. We believe it is important to think in terms of systems. Growth is a deep process that was initiated, as McCloskey makes clear, by significant cultural changes allowing different ways of thinking and talking about enterprise. In other words a *different system began to emerge.* This system then evolved—as Marshall, Schumpeter, Phelps, and Baumol have argued—over 200 years with new structures and systemic processes that demanded and fostered creativity, innovation, and change, the real ingredients of economic growth, through the mechanisms of entrepreneurship, the constant birth and death of business enterprises, and ongoing competition between those enterprises.

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[46] William J. Baumol, *The Microtheory of Innovative Entrepreneurship* (Princeton, 2010), 25.
[47] Baumol, *The Microtheory of Innovative Entrepreneurship* , 24.
[48] *See also* William J. Baumol, Robert E. Litan, Carl J. Schramm, *Good Capitalism, Bad Capitalism and the Economics of Growth and Prosperity* (Yale, 2007).

When we think of economic growth in this much more systemic way, we are enabled and forced to ask different questions. Questions that are not even remotely about small puts and takes to a mechanistic unchanging "given" economy. The right questions (and policies as we will discuss later) are inquiries regarding the social and political underpinnings of growth as much as they are about the standard economic inputs and outputs. They direct our attention toward language, the social environment, the division of labor between firms, and the right structuring of entrepreneurial activity. And if the right question to ask about growth is, as we said earlier, how can the *economic frontier keep expanding,* then the answer has to be found in these issues of structure and system.

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We believe that what is happening in the US economy today is the emergence again of a new system. We see an economic or business system as being in some ways an integral whole; driven by particular technologies, composed of specific kinds of institutions and processes and values; requiring changes in education; and often catalyzing changes in government, politics, and society. Change and disruption almost inevitably accompany the emergence of a new economic and business system. Real economic growth—the movement of the economic frontier—does not occur as a steady, incremental, almost-inertial aspect of an unchanging system.

What is happening today has happened before. In the nineteenth century and through the first half of the twentieth century, the American reaction to the successive appearance of steam, electricity, and internal combustion was the emergence then of a new business system, an entirely new platform of economic activity.

This produced *the factory system*, a multi-decade process of adaptation to the efficiencies of manufacturing, distribution, logistics, and everything that came with it. It required the notion of "the job," a new educational system (the high school movement), new policy structures (the welfare state), and new political responses. In one sense, decades of public and private investment can be seen as building out the full platform of the factory system. This business system endured for a century. It involved disruption and change, which was the object of much criticism and brow furrowing, just as is today's disruption and change. But it yielded vast improvements in standards of living, in health, and in life expectancy. It was a marvel, but we tend now to think that this must be *the* system rather than *a* system.

This is all happening again. This time the new thing, the new technological change driving us, is information technology. These technologies began to be important in the 1960s. They evolved quickly through the 1970s and 1980s, becoming more and more significant as Moore's Law (that the performance of integrated circuits doubles every eighteen months to two years) ground away. These ongoing changes pushed out the US economic frontier, raised our rate of growth, and began to affect other sectors of the economy. Then, starting in the first decade of this century, information technology mutated into very different forms, which began to reshape the economy. These developments were obscured by the Great Recession but began to be apparent as that ebbed. The combination of enormous increases in computing power, the Internet and then the Internet of Things, and cloud computing as they converged, represented changes in costs and

factors of production every bit as substantial as and even more pervasive than the industrial revolutions of the nineteenth century.

It is our view that these changes in information technology are leading to the birth of a new economic or business system. This new system will force economic change as broadly as did the emergence of the factory system 150 or so years ago. It is leading to social changes as substantial and pervasive as that system, and it will push out the US economic frontier, powering higher growth for at least the next twenty-five years. In the next chapter we will describe this new system.

Conclusion

Let's return to those Roosevelt Institute polls—it was easier to make a negative case concerning the economic future rather than a positive case. And as we have outlined in Chapter 2, Professor Robert Gordon has made a formidable negative case. He argues, first, that the United States faces major headwinds to immediate near-term increases in actual economic growth. And then he argues, more fundamentally that we will see a long-term, perhaps permanent reduction in economically significant innovation and therefore a permanent reduction in *potential growth*—another way of saying expansion of the economic frontier.

Gordon argues further that today's computer and Internet technology revolutions simply do not have the economic "punch" of previous eras of technology change, concluding that information technology will not have the productivity growth impacts of earlier technology revolutions that led to the Industrial Revolution and what we have called the factory system.

We have no quarrel with the obstacles to growth that Gordon lists. But we also think that they are either short term, solvable by sensible public policy, or can be turned into opportunities for growth rather than headwinds to growth.

But we do disagree with how the analysis of Gordon and others views the economy and how it is changing today. They see change as individual products and their impact and do not consider social systems, and economic structure, and, equally importantly, *changes in systems and structures*.

Our own sense is quite different. We suspect that products of the current industrial revolution—and the ways they are integrated through cloud-based computing—will be considerably more significant and life changing than Gordon forecasts. For example, the smartphone and its ecosystem of "apps" are as fundamental as any earlier Industrial Revolution product; the trio of drones, driverless cars, and robotics will be as paradigm shifting as anything those earlier industrial revolutions yielded. We see in this trio and many others exactly the sort of catalytic chain reaction that Phelps saw in the first stirrings of modern economies.

More to the point, we look at those earlier technology and economic revolutions and conclude that *beyond all of the product innovations what occurred then was a more profound innovation: the development of a new economic system.* And we see that happening again. In our view, simple growth accounting fails to see what is actually happening to the economy today.

We conclude this chapter by returning to Professor Benjamin Friedman whom we quoted earlier on the importance and moral consequences of growth. The whole point of our book ultimately has a policy purpose. As we said in an earlier chapter, we want to visualize the Good Economy in the hope this exercise will facilitate the creation of policies that raise the odds the Good Economy will actually emerge.

The thoughts of Friedman on this topic are extremely relevant:

> There is often a grudging aspect to the recognition that achieving superior growth is a top priority. As a result, especially when faster growth would require sacrifice from entrenched constituencies with well-established interests, the political process often fails to muster the determination to press forward. The all too frequent outcome, in low- and high-income countries alike, is economic disappointment, and in some cases outright stagnation.[49]

We think that in specifying what real economic growth, the kind that increases the economic frontier, is, we have also identified why developing and sustaining a coherent public policy to promote growth is hard.

Most of what passes for growth policy is little more than cheerleading: developing growth policy is far harder than most acknowledge, and involves much greater depth than has typically been displayed. The hard truth is that if growth is really the kind of system change we argue, then economic growth policies will always involve changing significant institutions; allowing disruptions to occur; and tradeoffs between the old and the new. There will always be innumerable spokespeople for the particular institutions or industries being disrupted; rarely will an actual spokesperson for growth be in the room when such tradeoffs are confronted.

Thus, while "economic growth" sounds nice as a political phrase, the reality of growth immediately makes it politically difficult. We will return to this broad theme again.

[49] Benjamin M. Friedman, *The Moral Consequences of Economic Growth* (Vintage, 2005), 4.

Chapter 4: The Shape of the Good Economy: What's Already Here and the Adjacent Possible

We are optimistic about the course of the US economy over the next few decades for two reasons. First, we see the simultaneous and parallel emergence of several important technological trends that are already reshaping much of the economy. Second, and even more important, we see these trends converging in ways that change how our economy works.

The first point is obvious. In our view the trends bringing about a Good Economy are all driven by the enormous and inexorable rise of computing power described by Brynjolfsson and McAfee in their prescient book, *The Second Machine Age*. The manifestations of this rise in the power of information technology are not simply faster traditional computers. We see as particularly important: (1) the full-scale development of cloud computing; (2) the ubiquity of smartphones; (3) the increasing centrality of the Internet and especially the Internet of Things; and (4) the democratization of finance through the rapid emergence of new financial technology. Two years or so from now we will probably add 3-D printing to this list. We believe that these technologies by themselves will push out the growth potential of the American economy.

The second point—a change in how our economy actually works—is much less obvious and much less described, and more important. The convergence or coalescence of these technology trends, not the trends alone, is an example of what Steven Johnson calls the "adjacent possible." Economic change does not occur in a smooth incremental way, nor in a predictable direction. It is path dependent and happens by "one door leading to another door."[50] To look ahead for the Good Economy, we need to look at the technology trends we can see coming together today and ask what "doors" they may lead to.

To consider this question, we will return to the notion of the business system we discussed earlier. And to jump to our conclusion, *we believe we are on the cusp of a major economic wave forcing the evolution of a new business system, and opening an entirely new set of "doors*."

As we argued in chapter 3, *the new business system* of the late nineteenth century through the first sixty years of the twentieth century, was the factory system. This system developed as follows. A set of new technologies emerged—electricity, the internal combustion engine—which were individually significant and collectively transformative. These new technologies created potential economic opportunities and in response a new class of entrepreneurs created thousands of new enterprises. As these developed, new forms of education were required and emerged from America's grassroots. New institutions, changed social structures, and different politics all emerged as the factory system evolved.

Something similar is happening today. The convergence of the technology changes we specify above changes costs and factors of production every bit as substantially as and probably even more pervasively than the industrial revolutions of the nineteenth century. We see emerging another "new American business system." This new system will drive public and private

[50] Steven Johnson, *Where Good Ideas Come From*.

investment for another half century, and will inevitably bring with it social and cultural change of the same magnitude as did the emergence of the factory system.

The first half of this chapter will focus on the technology trends we can clearly see today and the clear impacts they are already having. The second half of this chapter is intentionally speculative and will describe the new business system that is emerging and its implications.

The emergence of this new business system is largely positive. But we are also realists. The birth of this new system will not be easy and it will not be problem free. In the next chapter we will discuss the hurdles to that adjacent possible future: what needs to happen for that adjacent possible to fully materialize; and what challenges will the new system pose to Americans who will live and work within it?

The Good Economy: What's Already Here

"Software is eating the world." So declared entrepreneur and venture capitalist Marc Andreessen in 2011: "more and more major businesses and industries are being run on software and delivered as online services."[51] The insatiable appetite of computer code has become a mantra far beyond the world of Silicon Valley technology. This simple insight is a source both of unbridled utopian fantasy and depressive anxiety about the future of jobs and human agency.

Five years later, reality has gone beyond Andreessen's observation. Software is penetrating further into all sectors of the US economy, including those previously thought to be immune to digitization.

The decades-long reconfiguration of American manufacturing by the pressures of technological change and globalization is by now a familiar story. Vertically integrated companies have used technology to chop up their production process and manage supply and distribution chains that extend across thousands of miles and hundreds of companies. All manufacturing sectors are reducing labor costs and numbers of employees. Whereas Boeing, for example, handled most of the manufacturing and assembly for its passenger jets internally in the 1960s and 1970s, today scores of different companies in different places are involved in manufacturing a jet. But change in manufacturing continues: it is on the edge of another significant reconfiguration.

And now the "unbundling" process that hit manufacturing twenty-five years ago is making its way through the massive service sector, which makes up three-quarters of American economic activity.

As more data get generated and collected and analyzed for a given service activity—such as accounting, law, or retail—that activity becomes more of an informational commodity. When something becomes a commodity, it is more subject to digitization and algorithms, and less dependent on human activity. The process is self-reinforcing: digital data collection leads to digitization of the activity, which precipitates even more data collection and so on.

This "industrialization of services" is already creating new modes of value creation and new

[51] Marc Andreessen, "Why Software is Eating the World," *Wall Street Journal*, August 20, 2011.

platforms for economic activity. It also promises huge productivity gains, because the service sector has long been subject to Baumol's cost disease, whereby productivity growth potential in services was limited:

> Fully automated systems offer the greatest potential productivity gains. Because they rely on digital systems, the power, efficiency, and affordability of algorithmic services can be expected to improve in accordance with exponential increases in computing capabilities. As chips improve and multiply, and the networks they form become exponentially more powerful, the possibilities for fully automated digitized services expand dramatically.[52]

The future of the service sector is in the algorithm, and this opens up massive new possibilities for entrepreneurship and innovation and growth. It also has a downside, of course, which we address in the next chapter.

We are only in the earliest stages, moreover, of this algorithmic revolution and its consequences for services and other sectors.[53] A relatively new driver of continued change in services is the development of cloud computing. Most people have experienced "the cloud" in the form of services such as Dropbox, Box, Google Drive, and iCloud. But beneath the surface, cloud computing is developing into what UC-Berkeley's John Zysman and others call a "dynamic utility."[54]

Zysman, also a participant in the Roosevelt Institute's Next American Economy initiative, thinks cloud computing will develop into its own production environment, innovation ecosystem, and marketplace. The industrialization of services, through continued advancement in IT capabilities, is one illustration of this. And, like other utilities, cloud computing will give rise to new platforms of entrepreneurship and value creation. This is one reason why so many companies from different sectors—Google, Amazon, Microsoft, Salesforce, Cisco, telecommunications firms—are competing for different parts of the cloud computing ecosystem.

Another implication of the algorithmic revolution and the transformation of the service economy is the rise of the "gig economy." This describes the ability, using mostly new tools of technology, for companies and individuals to accomplish work through a series of "gigs," or short-term assignments. Because we believe the gig economy will be a fundamental aspect of the new business system we will discuss it in more depth later on in this chapter.

The gig economy and the ability of individuals to harness the power of the cloud through the click of a button (or tap of an app) have also been driven by the increasing ubiquity and power of

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[52] John Zysman, Stuart Feldman, Kenji E. Kushida, Jonathan Murray, and Niels Christian Nielsen, "The ICT-Enabled Digital Transformation of Services," *in* Dan Breznitz and John Zysman (eds.), *The Third Globalization: Can Wealthy Nations Stay Rich in the Twenty-First Century?* (Oxford, 2013). *See also* Philip Auerswald, *The Code Economy* (forthcoming, 2016).

[53] Hezekiah Agwara, Philip Auerswald, and Brian Higginbotham, "Algorithms and the Changing Frontier," *in* Adam Jaffe and Benjamin Jones (eds.), *The Changing Frontier: Rethinking Science and Innovation Policy* (Chicago, 2015).

[54] Kenji Kushida, Jonathan Murray, and John Zysman, "The Gathering Storm: Analyzing the Cloud Computing Ecosystem and Implications for Public Policy," *Digiworld Economic Journal*, 1st Q 2012.

smartphones. The rise and spread of the smartphone has been stunning in its size and speed: from zero just a decade ago, now two billion people around the world have one, and that might double in the next five years.[55] Penetration has already reached over 50 percent in North America, and the rest of the world will rapidly catch up in the next two decades. The power of an entire mainframe computer, which used to represent the frontier of computing, now resides in more and more individual pockets, not to mention the additional capacity allowed through the access the smartphone allows to the cloud. Smartphone potential and popularity have even prompted some observers to predict the demise of tablets such as the iPad!

The smartphone has already created an entire class of companies and activities that did not previously exist: mobile apps. There are now hundreds of companies building apps for smartphones and tablets for every kind of pursuit you can imagine. These go way beyond the games or idle activities many people still associate with apps. Mobile enterprise apps are a fast-growing category and now attract hundreds of millions of dollars in funding—this includes productivity apps, payment apps, and apps for specific sectors like retail and health.[56] The app ecosystem is so large, in fact, that it has spawned an entire industry of app "enablers," who assist with things like development, monetization, and user acquisition.[57] Economist Michael Mandel has estimated that the "app economy" now accounts for around 750,000 jobs all over the United States, and if current mobile app trends continue, that number will only grow.[58]

Further, smartphones and increases in computing power have created a new class of entrepreneurs: those who optimize underutilized assets. This is best exemplified by companies such as Uber, Lyft, and Airbnb. Many other startups are bidding to be the "Uber of (fill in the blank)." Most will no doubt fizzle. But what they represent is something more powerful—the ability to extract value from things, such as cars and spare rooms and entire buildings, that have typically been treated as depreciating assets.

We can also already observe this in the integration of sensors into all sorts of physical artifacts that turn simple objects into new vehicles of data collection and that also allow companies to move increasingly into new types of service provision.

The proliferation of sensors connected via the Internet is known as the Internet of Things, and the term captures the convergence of computing, the cloud, and new platforms such as smartphones. This convergence has enormously disruptive effects on individuals and companies, effects we discuss in the next chapter. But, like prior technological revolutions, it is also already creating new classes of work, new types of value creation, and new platforms of entrepreneurship and innovation.

CB Insights, for example, is a company that tracks trends in tech startups and venture capital

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[55] "The truly personal computer," *The Economist*, February 28, 2015.
[56] Kevin Spain, "Mobile Enterprise Trends, 2015," Emergence Capital, September 8, 2015.
[57] Spain, "Mobile Enterprise Trends, 2015."
[58] Michael Mandel and Judith Scherer, "The Geography of the App Economy," South Mountain Economics, September 20, 2012; Michael Mandel, "752,000 App Economy Jobs on the 5th Anniversary of the App Store," *The Progressive Fix*, Progressive Policy Institute, July 8, 2013.

funding. Based on all this new activity, on software's consumption of everything, CB Insights has begun publishing "periodic tables" that track startup activity in several areas that either didn't exist even a few years ago or were previously not seen as fruitful areas of entrepreneurship. There are now "periodic tables" for health care, financial technology, electronic payments, digital health, e-commerce, the Internet of Things, and even human resources technology.[59]

The emerging Good Economy is not just about information technology and what it enables. The United States is also in the early stages of reaping a windfall from shale gas and shale oil that could satisfy most of the country's energy needs for at least another century. Already, it is estimated that the country has gained nearly $50 billion *per year* in total welfare from shale gas alone since 2007.[60] These benefits vary across the country, and most of the benefit has been for industrial and retail consumers rather than producers, but there is no denying the total benefits.

Shale oil has probably been an even greater benefit, helping precipitate a dramatic fall in oil prices in 2014 and 2015. This presumably helped consumers and business across the board, especially in transportation. Thanks to shale oil, the United States has leapt back to the fore of global oil production. The sustainability of that production, however, could depend on production levels elsewhere in the world (particularly among OPEC countries). The shale oil boom in the United States was helped by technological innovations but also high oil prices, which made the economic calculus for shale oil positive. In early 2015, J.P. Morgan analyzed the breakeven prices for various US regions—some, like parts of the Bakken formation in North Dakota, can survive a sustained drop in oil prices. Others, including Eagle Ford in Texas, might need higher oil prices for drilling to make sense.

Either way, the unlocking of US shale oil has sent an unexpected shock through global energy production and consumption, and we count this among the features of the emerging Good Economy, despite its short-term disruptive effects (defaults on loans or bonds that financed some companies' exploration when oil prices were much higher). We must also note that the carbon implications of shale are mixed. On one hand, switching from coal to natural gas to generate electricity leads to a reduction in emissions. On the other hand, cheap shale oil lessens the pressure for any shift away from reliance on oil for things like gasoline. We will address this topic in the next chapter.

For now, to summarize our sense of "what's already here," we believe that information technology—in its several manifestations from sensors to software, from the cloud to computing capacity—is disrupting and reshaping more and more aspects of American economic activity and life. Why does this disruption and reshaping represent an emerging Good Economy? Because these forces and trends are making our very mature economy more dynamic, innovative, and productive. And these changes in turn raise our potential for growth. In the next chapter we will ask the essential follow-on question: will this newly dynamic American economy allow broad participation, higher mobility, and more equality? Or must it inevitably mean an intensification

[59] See www.cbinsights.com.
[60] Catherine Hausman and Ryan Kellogg, "Welfare and Distributional Implications of Shale Gas," *Brookings Papers on Economic Activity*, Spring 2015.

of the winner-take-all economy?

The Adjacent Possible: What Could Come Next

It's impossible to know, of course, where the foregoing developments might lead, or whether the anticipated potential from today's emerging technologies and economic trends will actually materialize. Already, for example, some observers have said that "fog computing" rather than cloud computing is the way of the future.[61] Others have pointed out that, for all the hype and horror around the advance of artificial intelligence (AI), it is likely to become more of a "boring" utility, albeit one that transforms everything else along the way.[62]

Yet we have highlighted these various trends—smartphones, cloud computing, services remade by IT, an energy revolution, and so on—because they appear to be capable of creating a new American business system. This new system, marked by a renewal of American entrepreneurship and new platforms of work, will shift the trajectory of American economic growth.

We base this expectation on the adjacent possible opened up by the developments described above. For example, the Internet of Things isn't just about easier ways to know when your refrigerator might need repair—it also allows the construction of new "smart cities" that combine new information technology and existing urban infrastructure. Cloud computing isn't just about easier ways to store and share photos—it could create an entirely new technological ecosystem in which the Internet is a new type of factory. The gig economy isn't just about easier ways to hire a plumber—it creates new platforms of innovation and new business models for entrepreneurs to exploit.

The emergence of this distinctive new business system will fundamentally change how the US economy works and because of those changes will move our economy to a higher growth path. We anticipate a next big wave of growth driven by a virtuous circle of high rates of technological change, enabling high rates of innovation, in turn making possible high rates of business formation to exploit the new innovations. This process of change will be consolidated by a follow-up wave of investment to bring these innovations and new businesses to scale. We think this impending new growth wave could last for the next two decades or so. This is akin to moving, in James Bessen's formulation, from invention to technology en masse.[63]

Before beginning to describe the main features of the new business system, we should underline its two significant characteristics: convergence and disruption.

First the emergence of this new business system will be driven mostly by the *convergence* of the new technologies we've discussed, not by their individual effects. The true transformative impact, as in past accelerations of growth, will be combinatorial: cloud computing + hundreds of thousands of sensors + the Internet; or 3-D printing + robotics + the Internet + sensors.

[61] Christopher Mims, "Forget 'the Cloud'; 'the Fog' is Tech's Future," *Wall Street Journal*, May 18, 2014.
[62] Kevin Kelly, "The Three Breakthroughs that have Finally Unleashed AI on the World," *Wired*, November 2014.
[63] James Bessen, *Learning by Doing: The Real Connection between Innovation, Wages, and Wealth* (Yale, 2015).

Second, the major thrust of the technology change-innovation-business formation circle will be highly disruptive. New products, services, and methods of production will appear, transforming large parts of the economy, creating new sectors, and establishing platforms for the creation and growth of many firms across many sectors of the economy. We've already seen disruptions in media, journalism, most of manufacturing, the taxi business, and advertising. Disruption of the financial sector is next, followed by the next manufacturing transformation, then quickly followed by the further digitization of services we referred to earlier.

The disruption we are already seeing is very clearly a double-edged sword. Disruptive innovations are the most important drivers of productivity growth, and improvements in living standards, over the long run. Examples include electricity, indoor plumbing, the automobile, the railroad, the airplane, computers, and air conditioning.

But almost by definition, disruptive innovations are impossible to forecast, hard for incumbent firms to respond to, and therefore destroy many firms and jobs while creating others. They also take many years, if not decades, for their full effects to work their way through the economy. It is our strong sense that many Americans in the labor force or entering the labor market are not prepared for these changes in the market. Accordingly, the need for an educational revolution may be the biggest barrier facing the evolution in America of the next business system.[64]

Now, to go back to Steven Johnson and the adjacent possible. We believe that it is possible to describe the Good Economy further than simply saying it will result from combinations of technological change and will be disruptive. To be specific and obviously to speculate, we think the Good Economy of the next twenty-five years will have the following six features.

(1) The Internet, the "factory platform" of the Good Economy, will rearrange firm boundaries.

The Internet's first twenty years have already altered the economy. Its evolution over the next twenty-five years will be the primary driver and shaper of the emerging new business system. It will be even more the Internet of Things and it will function seamlessly with cloud computing and mobile technologies. It will be the platform through which most businesses operate, and most business functions are carried out. As such, boundaries between firms will be rearranged.

That is perhaps obvious, but it bears some consideration. Above, we cited William Baumol's division of labor between small, entrepreneurial firms and large, established companies—the former specialize in breakthrough innovations, while the latter take those breakthroughs and improve on them incrementally through their scale and scope. In part, this division of labor has been dictated by the lifecycle of technologies.[65] Now, the Internet and cloud computing and mobile devices are already creating a new symbiosis between entrepreneurial firms and established corporations.

Since the dotcom bust and recession of 2001, the equity markets have enforced what Jay Ritter has characterized as an "eat or be eaten phenomenon." Particularly in information technology,

[64] Bessen, *Learning by Doing*.
[65] Bessen, *Learning by Doing*.

organic growth has been discounted and firms went for growth through acquisition or being acquired—in part this explains the sluggish IPO market over the last fifteen years.[66] Yet in just the past few years, a new generation of technology firms has pursued the virtues of organic growth. What is emerging is a new symbiosis: large companies such as Amazon, Microsoft, Apple, Google, Salesforce, and Facebook have become—in one form or another—the new infrastructure companies of the IT economy. There is some irony here as Amazon and Google are both less than twenty-five years old, and Facebook is only a decade old. Yet these are the companies building the new infrastructure of data centers and cloud-based servers that are creating new arenas of competition and technological innovation: infrastructure-as-a-service, for example.

The new information technology infrastructure has become the backbone for a new generation of entrepreneurs in the same way that past infrastructures—railroads, electric grids, highways, telecommunications—were platforms for entrepreneurship and innovation. Large, integrated companies won't disappear, but the nature of the value they create and how they compete and cooperate with rivals and entrepreneurs is already shifting. According to Robert Cohen, senior fellow at the Economic Strategy Institute, the adoption of these technologies has already become "mission critical" for all firms.[67]

In some sectors, then, the advantages of scale have been reinforced. Elsewhere, such as in finance, the combination of cloud computing and mobile applications (brought together by large and small firms) is unbundling the integrated package of services that characterizes traditional banking. Thus, in some sectors, the liabilities of scale are becoming more pronounced. These divergent processes will continue for a number of years and the new landscape of aggregation and disaggregation will not be settled for quite some time. In manufacturing, for example, 3-D printing and the maturation of the "maker movement" will likely move from tinkering shops to mainstream products, creating a new stream of value creation and specialization with all its attendant consequences. Over the next few decades, the equity markets will reinforce this changing calculus of scale and accord less reward, for example, to mergers and acquisitions.

(2) An entrepreneurial comeback

A high rate of business formation and change is critical to our construct of the Good Economy. New firms are important because disruptive innovations are often, and most likely, commercialized by new or young firms that have no vested interest in the status quo.[68] Think of more new firms as more "shots on goal" or "swings at the bat": with more tries, the more likely it is that some of them will turn out to be the truly disruptive game-changers the economy will need if annual productivity growth is to reach a level allowing a sustained 3 percent annual rate of economic growth.

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[66] Xiaohui Gao, Jay R. Ritter, and Zhongyan Zhn, "Where Have All the IPOs Gone?" Working Paper, November 2011, http://bear.warrington.ufl.edu/ritter/Where%20Have_Nov4_2011.pdf.
[67] Personal communication with authors.
[68] Daron Acemoglu, Ufuk Akcigit, Nicholas Bloom, and William R. Kerr, "Innovation, Reallocation and Growth," National Bureau of Economic Research, Working Paper 18993, April 2013.

Likewise, a pickup in the startup rate will be essential if the US economy is going to generate sufficient jobs to remain at full employment (we'll get to the critical subject of what *kind* of jobs in a moment). Until the Great Recession, young firms were responsible for virtually all of the *net* job creation (hires minus departures, voluntary and involuntary) in the United States since 1980.[69] One reason for the relatively slow rebound in employment during this recovery is the post-2008 drop in the absolute number of startups, from just over 561,000 in 2006 to fewer than 400,000 in 2010. Even three years later, in 2013, business creation had barely risen from the recessionary nadir, and actually fell again, albeit slightly, from 2012 to 2013.[70]

We contend that the United States is on the cusp of another entrepreneurial boom. For one thing, over the next twenty years, the millennial generation will enter the peak entrepreneurial years of their thirties and forties. The average age of business founders in the United States is right around forty and, should this hold, we should expect an increase in business creation from sheer numbers of potential entrepreneurs.[71] Further, it strains credulity to believe that rapid technological change—in robotics, artificial intelligence, cloud computing, the blockchain, and so on—will *not* lead to an increase in entrepreneurship. It's possible, of course, that entrepreneurial opportunities in some areas will draw potential founders away from other areas—thus leading to no net increase in entrepreneurship—but the abundance of opportunities and the structural changes underway in the American labor market raise the likelihood of an overall increase in entrepreneurship.

(3) Manufacturing once again reshapes the economy

A central development of the emerging new business system is that labor costs in manufacturing—all manufacturing, including the "manufacture" of many services—are declining toward zero. Driven by rapid technological change, direct production labor is rapidly becoming an insignificant cost factor in manufacturing. If a task can be routinized into a list and a set of procedures—which is essentially what has happened steadily since the advent of the production line itself—then it will be.[72] At the same time, the direct economies of scale in manufacturing are diminishing.

Paradoxically, these developments are almost entirely positive things for the Good Economy in America. Why?

First, because we've already lost most of our manufacturing labor, this trend won't hurt us. Today, manufacturing employees are about 9 percent of the total American workforce after an almost constant trend decline over forty years from a peak of about 30 percent. And most, if not

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[69] Ryan Decker, John Haltiwanger, Ron Jarmin, and Javier Miranda, "The Role of Entrepreneurship in US Job Creation and Economic Dynamism," *Journal of Economic Perspectives*, Summer 2014.

[70] Data on business creation can be found in the Business Dynamics Statistics of the United States Census Bureau, *at* http://www.census.gov/ces/dataproducts/bds/.

[71] Daniel F. Spulber and Dane Stangler, "The Age of the Entrepreneur: Demographics and Entrepreneurship," Paper prepared for Innovation for Jobs Summit, March 2014, http://i4j.info/wp-content/uploads/2013/05/i4jDaneStanglerDemographicsandEntrepreneurship-1.pdf.

[72] *See, e.g.*, Dongya Koh, Raul Santaeulalia-Llopis, and Yu Zheng, "Labor Share Decline and the Capitalization of Intellectual Property Products," Working Paper, April 2015.

all of these workers, are in very high capital investment, high value-added jobs requiring very high, very specific skills. They are not endangered. We suspect that our economy is now at the perigee of the manufacturing employment downward trend.

Second, this technological trend means that global comparative advantage in manufacturing is shifting: from economies such as China or India with huge surpluses of very low-cost labor, to economies more like America's with far better business environments, traditions of innovation and startups, tolerance for risk taking, and enthusiastic attitudes toward small and medium-sized businesses.

Several consequences of these shifts are likely. The manufacturing of many products will be profitable in America again. Competition will not be solely or importantly based on the costs of direct labor. The availability of "independent capital" will be critical. Small and medium-sized companies will be much more important within the ecology of American business. The intensity of change in the new manufacturing will be much greater—there will be more startups, and more failures. Manufacturing will increase as a share of GDP, but not as a share of total employment.

This same technological trend will affect services as much as manufacturing but over a longer period. A large part of the labor costs of services—and this is more true as services become more sophisticated—will be subject to the same pressures we clearly already see in manufacturing.

(4) New platforms take over

As economies, industries, and work have changed, the organization of markets, workers, and skills have always also necessarily changed. As the commercial economy of Europe began to self-organize in the early Middle Ages, trade fairs were a central institution. Later, guilds were crucial in the organization of work and skills. Labor unions and chambers of commerce grew in parallel with the rise of our industrial economy.

The same thing will happen again. We cannot know the precise shape of the new platforms, but we can make some early guesses at the roles they will carry out, and perhaps at early prototype structures.

We believe that these new platforms will meet three changed needs. First, they will offer new means of marketing and selling goods and services. Second, they will provide ways for workers at all levels to know about new assignments, to qualify for and schedule assignments, to collect payments and to meet such needs as insurance, pensions, child care, and elder care. And third, they will offer career management services. These latter two roles—which for decades we have assumed were simply aspects of what major (and minor) companies did—will split off as companies virtually everywhere go out of the business of managing workers and work. All of these new platforms will use the Internet as a fundamental part of organizing the new economy.

There is no linear path along which the platforms of the Good Economy will evolve. What we emphasize here is that the profoundly different nature of jobs and work in the emerging Good Economy will require profoundly different platforms for organizing work and careers.

(5) Smart cities midwife the Good Economy

The Good Economy will not emerge in midair in a space called America. The city or, more likely, the mega-region will be the driving force and the natural home of the emerging Good Economy.

As cities evolve to become functioning mega-regions, they will offer to the enterprises of this emerging new business system both the connections and networks required to start businesses and develop businesses; and for women and men of the next generation the networks to find jobs or work, or the lifelong learning required of either. At the same time as mega-regions evolve they will also be developing networks for trade or investment or jobs and work with other mega-regions in the United States or in other nations. It will be more and more obvious that the unit of analysis of economies and for much of public policy will be the city or mega-region not the nation state.

We've defined the emerging Good Economy as driven by the continuing revolution in information technology; distinguished by a high level of dynamism—startups, failures, changes in the nature of jobs and work, and movement of people between jobs and work; and by a requirement for constant learning. Each of these distinctive features is best supported and provided for by the city.

At the core, cities offer people and clustering. As Richard Florida says: "When people locate close to each other, it becomes easier to trade and work and obtain goods. This is the source of a city's value. Cities create this value through the building stock, infrastructure, laws, and institutions that enable many people to live separate lives while also participating in the millions of transactions that make our economy."

Clustering develops a momentum of its own. With the growth of business clusters, enterprises related to the developing clusters and enterprises offering the third-party services required by other enterprises join the clusters. And these clusters become specialized. Florida again: "Industry clusters, like New York's old textile business and its present financial sector, are one of the striking features of industrialized economies." The same will be even truer of the Good Economy and its focus on information.

Florida sums up this process of cluster development by arguing that cities offer three advantages: (1) intensive forward and backward integration between suppliers and their customers; (2) deep labor pooling; and (3) "conduits for and processors of information. And it is the magic of information spillovers and their role in the innovative process that drives sustainable growth."

This will be particularly true for the emerging Good Economy. Complexes of hyper-specialization will be the distinctive structure of the new business system. And even in an IT-based economy, much, maybe most, knowledge crucial to the functioning of any business or business cluster will continue to be informal, and uncodified, existing in the minds of workers, and the processes and cultures of specific companies.[73] To give the simplest possible example,

[73] *See also* Philip Auerswald, *The Code Economy* (forthcoming, 2016).

the relationship between a manufacturer and a crucial component supplier is almost always characterized by an intensive flow of information going both ways, and most of this information is never written down anywhere.

These knowledge-intensive specialization complexes will work best when the players are near each other, when suppliers, designers, marketers, sales people, logistics specialists, and information system designers can meet often and informally. These complexes will, inevitably, be located in metropolitan areas. Our cities, therefore, are the basic platforms for the emerging complexes of specialization.

In the coming decades, competitive advantage for the enterprise, for the particular specialization, for the city or mega-region that houses a particular cluster, and for the United States will stem fundamentally from the quality of the platform as a whole. And this means that the quality of very local governance, of infrastructure, and of education will be crucial determinants of competitive advantage or disadvantage. The city or mega-region will not simply be the home for these clusters. The quality of how our cities or mega-regions function will come to be an independent factor either detracting from or adding to frontier-expanding economic growth.

(6) The gig economy takes off

As the Good Economy and this new business system emerge, the nature of jobs, work, and careers will change substantially. In our view, what is ending is the inevitability of the forty-hours per week, five days a week, long-term job. This organization of work has been the centerpiece of our industrial economy for one hundred years. Certainly, this way of organizing work will continue to be an important aspect of our economy for millions of men and women for some time. But it won't be the centerpiece of the Good Economy and it won't represent what is happening at the margin of change of our economy. One clear sign of this is that major companies throughout our economy are eliminating jobs as rapidly as possible.

It is our judgment that while "jobs" of this traditional nature may remain, it would be unwise for most men and women to plan their lives assuming that they will find and keep a traditional job for all of their lives. Getting our collective heads around such a fundamental change as the organization of work will be one of the more important conceptual hurdles we face.

But "work" and the necessity to make one's way through life and earn a living aren't going away. So what will begin to take the place of the "job"? Three phenomena will become more important: part-time assignments; portfolio careers; and more pervasive entrepreneurship. To explain:

First, it is highly likely that for many people work will increasingly consist of short-term assignments and a career will be composed of a bundle of such assignments over a lifetime. Today, this is known as the "gig economy."

Second, we think it is also likely that many people will be carrying more than one of these short-term assignments at any given time. Not everyone will want to manage a portfolio of

assignments but many will see this as a way of making the most of their talents and of raising their incomes.

Finally, we think an element of entrepreneurship will be a more important aspect of all work. We mean this in the following ways.

If the rote, predictable, slow-to-change job is going away, then everyone has to plan for work that is not rote, less predictable, and more rapidly changing. This means that everyone will have to be much more responsible for their own careers. In particular, everyone will have to think much more constantly about the next assignment, the skills required for that assignment, and the education and credentials required to gain those skills and provide evidence to others that you possess them.

But if individuals have to be more entrepreneurial in planning their lives, there will also be many more possibilities at all levels of work for defining even what is now seen as low value-added work in more value-added ways. Specifically, in the vast sector of individual and household services, we think the combination of human skills, new technology, and knowledge will provide enormous scope for individual ingenuity and innovation in defining ways of adding value and income to what have always been considered low-level jobs.

In some parts of the economy, especially creative sectors, this evolution is already quite far along: musicians, artists, writers, and those associated with them have over the past decade gained extensive experience in assembling portfolios of jobs and utilizing new platforms like YouTube to advance their work.[74]

Adam Davidson, creator of NPR's *Planet Money*, calls this the "Hollywood model," in which teams of individuals come together in a largely self-organizing fashion to work on specific projects. In Davidson's telling, this mode of work—which has characterized Hollywood for many years—is already making its way across other parts of the economy. Platforms like TaskRabbit, Zaarly, Thumbtack, Upwork, and many others have arisen over the past several years to serve the demand for such gig-based work but also hasten its growth. In the next chapter, we will discuss some of the concerns generated by the gig economy. For many people, though, the gig economy allows more flexibility, potentially greater rewards, and the ability to make a direct impact through their work.

Some observers see any shift away from full-time, secure employment as disastrous for workers and the economy. We have built an entire business system around the notion of stable jobs and full-time, W-2 employment. Anything short of that—such as 1099 contract-based employment—would be a raw deal for most Americans. The "Uberization" of American employment threatens low-wage work and augurs a future of "turning the world into a Home Depot parking lot."[75]

Certainly, there are concerns with any shift away from the employment system that characterized

[74] Steven Johnson, "The Creative Apocalypse that Wasn't," *New York Times Magazine*, August 19, 2015.
[75] Jerry Davis, "Capital markets and job creation in the 21st century," Brookings Institution, Center for Effective Public Management, December 2015.

most of the twentieth century and thus has characterized most Americans' work experience. But, considering the realities of low-wage work in the sectors that "Uberization" purportedly threatens, movement toward task-based on-demand work could actually improve the lot of workers. Low-wage employers such as restaurants and retailers currently limit the availability and predictability of work for their employees, shutting many employees out of full-time work, or using the thirty-hours-per-week threshold enshrined in employment law as a way to avoid providing benefits. By contrast, Uber and TaskRabbit and other on-demand services allow workers more leeway to control the hours they work and the duties they fulfill.

The choice, as technology entrepreneur and writer Tim O'Reilly has starkly put it, is not between "good" W-2 employment and "bad" 1099 employment, but between a scenario of "continuous partial employment" based on fixed but unpredictable schedules and employee surveillance (the current world of low-wage service work for millions of Americans), or a scenario of independent contractors with the tools in their hands to map demand, respond to demand, and work hours they determine.[76] These are two types of employment, two types of transparency, and two types of technology use both have their benefits and shortcomings, but we shouldn't prejudice the choice based on what the old business system looked like.

The combination of high rates of technological change, the disaggregation of old business systems, and the Internet as the basic platform of the new economy will provide much more scope for entrepreneurial actions. Work in the Good Economy can be even better and more fulfilling for most men and women than it was at the heyday of the twentieth century economy. But we also want to express a caveat. The emerging Good Economy will ask more of individuals—more attention to anticipating the next gig, and more focus on the skills required for that next gig. Everyone will have to be their own entrepreneur.

The Rise of the Artisanal Economy

Larry Katz, one of America's most influential labor economists, has used the term "the artisanal economy," to describe how he sees the future economy. One of us has used the term "mass specialization." Both are efforts to describe an economy that has not yet emerged; both, we believe, are accurate.

Together they describe an economy composed of a significantly higher proportion of smaller companies; many of them close to virtual companies almost entirely mediated via the Internet. It could be an economy in which the driving force is an extremely high level of business startups, driven by the high rates of technological change we believe are occurring and will continue.

The two descriptors are intended to assert where economic value will come from in the Good Economy. We see a continual process of specialization in which individuals using the new technologies create highly specialized goods and services at wide ranges of prices. The use of the word "artisanal" does not imply that Americans will turn to cute little crafts. We see an end to the factory system that characterized the economy of much of the twentieth century.

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[76] Tim O'Reilly, "Workers in a World of Continuous Partial Employment," The WTF Economy, Medium, August 31, 2015, https://medium.com/the-wtf-economy/workers-in-a-world-of-continuous-partial-employment-4d7b53f18f96#.gb5dmslzf.

As we asserted earlier, we anticipate the reversal of a one-hundred-year process of aggregation. Over a long period of time, manufacturing (and big service companies) came to be not simply the making of things but also a very large set of associated functions—R&D, design, marketing, sales, logistics, information systems, procurement, supply chain management, and finance—all optimized around a system that functioned best when it had very long production runs of essentially commodity products. Many "manufacturing workers" never built anything, were never on a production line. All of these came to be clumped together in command and control systems not because they inherently fit together, but because it was the most practical, cost-efficient way to manage.

What we are now seeing, and will see more of, is a process of disaggregation. Many, probably most, of these functions will split away from each other. And the ecology of the new business system will look very different.

At the core of this ecology will be high-tech commodity manufacturers, with relatively little employment, and big or small plants depending on the market, building the core product. Surrounding the manufacturer will be independent firms taking the core product and offering highly specialized versions to particular sub-markets; independent design, logistics, marketing and sales, and supply chain firms. (Services will move in the same direction. Most of the big service sectors will also come under constant pressure to disaggregate.) And we see the potential for a parallel flourishing of very small enterprise: just as examples, information technology and 3-D manufacturing will together lead to completely different crafts; knowledge + information technology + robotics will lead to different household services.

The growth of further specialization is possible for the reasons we have already asserted. The core basic costs of manufacturing and service provision will be lower and this will allow the costs of specialization to be brought into the value chains.

More specialization also is inevitable because of competition and consumer demand. The competitive pressures of many small and medium businesses will simultaneously accelerate the manufacturing disaggregation already occurring, and will create opportunities for the development of very specific sub-market niches. Core manufacturers will discover quickly that they cannot maintain the breadth of functions they now attempt, as they are outperformed by relentlessly more focused competitors. "Specializers" will discover that the opportunities lie in deep knowledge not in breadth.

The end result of these new complexes will be mass specialization at a level that has never been possible before.[77] And while the very large-scale business of any given product complex will employ fewer men and women than the analogous businesses of the past—a trend they have been on for many decades anyway—the overall complex including all of the specializing companies will employ more.

[77] For a deeper exploration, see Peter Marsh, *The New Industrial Revolution: Consumers, Globalization, and the End of Mass Production* (Yale, 2012).

This new artisanal, mass-specializing economy will not look the same everywhere, and won't happen all at once. We are a very large country with an immense economy. We will inevitably have almost any combination of human capability, technology, and specialized products and services imaginable. In some sectors where existing incumbents have close to monopoly power, the changes will be slower. But those differences aren't relevant to the argument. Over the next twenty-five years, these changes will be inexorable and pervasive.

As we will suggest in the next chapter, there is much to be done to usher in these changes and create circumstances under which ordinary Americans, not just an elite, can grasp what we believe will be great opportunities.

Chapter 5: The Race Between Two Futures: Which Path Do We Choose?

The economics discipline has taken a beating in the last decade, with many people criticizing economists and their mathematical models for, variously, failing to predict the housing crash and financial crisis and recession, failing to foresee a sluggish recovery, and failing to know what to do about any of it. Don't economists know that reality is more complicated than an equation-filled model?

We have offered our own critiques here but, to be fair, no economist mistakes his or her model for the real world. Like any cognitive tool, economic models allow you to cut through the noise of reality and hone in on key principles or elements. A standard history of the twentieth century, for example, would cover all the usual bases, from the Great Depression and World War II, to the baby boom and golden years of the 1960s, the stagflation of the 1970s, the rebound of the 1980s, productivity surge of the 1990s, and so on. Each decade would receive its own analysis of the causes of economic growth or lack of growth, complete with attribution to different presidents or Congresses.

That's all well and good, but that kind of approach can also confuse signal with noise. If we really want to identify the fundamental sources of economic growth at their most basic level, it's hard to do much better than an economic model. Using this approach, economists have pinpointed three major sources of economic growth for the period 1950 to 2007: rising educational attainment, rising research intensity (R&D), and population growth.[78] Basically, there were more people who were learning more, generating more ideas, and as a result of more education, doing more with those ideas. That's pretty compelling.

Unfortunately, those fundamental sources of growth are changing, as has been detailed by Robert Gordon and others discussed here. The rise in educational attainment has slowed. Rising research intensity—usually measured by R&D expenditures—faces budgetary constraints. And, population growth has slowed. This forms the core of the case for economic pessimism.

Another analytical way to look at it—and one that perhaps provides more reason for optimism—is through the long lens of history. Today, there is high anxiety about the effects of technology on human employment. Over the past two decades in particular, "job polarization" has entered the general lexicon to describe worrisome trends in the distribution of new employment creation. As it turns out, this general pattern of technology's effect on employment has characterized the last *200 years* of American history: "there is a common theme to the effects of technical change across the two centuries [19th and 20th], displacing skilled labor from some tasks, but increasing its use in other tasks."[79]

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[78] John G. Fernald and Charles I. Jones, "The Future of U.S. Economic Growth," *American Economic Review* (104)5, May 2014.

[79] Lawrence F. Katz and Robert A. Margo, "Technical Change and the Relative Demand for Skilled Labor: The United States in Historical Perspective," in Leah Platt Boustan, Carola Frydman, and Robert A. Margo (eds.), *Human Capital in History: The American Record* (Chicago, 2014) 48.

Across 200 years, technological change has consistently altered the mix of American employment but one thing has been constant: the so-called "hollowing out" of the labor force has characterized each period of change. In the nineteenth century, the twentieth century, and today, technology is eliminating "middle-skilled" jobs but *creating more* high-skilled and low-skilled jobs. The "new" low-skilled jobs created by technological change become the "new" middle-skilled jobs of the next era, joined by entirely new high-skilled work: "In both centuries, the diffusion of new capital goods altered the assignment of workers to tasks. Some of these reallocations displaced skilled labor, while others did the opposite. On net in both centuries, technical change has tended to increase the relative demand for educated labor."[80]

In other words, there is always technological change, there is always adjustment pain from the change, and there is always more demand for skilled and educated workers as a result.[81] As they push out the technological frontier, Americans respond by altering and upgrading their skills. That's one way to sum up the sweep of American history.

Importantly, the process of adjustment is not automatic. Americans have engaged in a continuous process of institutional innovation that helped the country adapt to technological change. In the early twentieth century, the biggest institutional innovation was the "high school movement," which spread a standardized general curriculum that trained Americans to work in the factories and offices of the new industrial economy. In the mid-twentieth century, the biggest institutional innovation was the creation of the welfare state, which established a safety net underneath American workers and encouraged the build-out of the industrial economy. In the last quarter of the twentieth century, it was the democratization of higher education, as more Americans went to college in response to the higher demand for skills generated by technological change.

Put this way, it's not hard to see why Claudia Goldin and Larry Katz portrayed this dynamic as a "race" between education and technological change.[82] Today, we might characterize the next three decades as a similar "race" between a pessimistic and optimistic future. The headwinds and challenges identified by Robert Gordon are powerfully undeniable and are racing us toward a pessimistic, low-growth economic future. The tailwinds of the emerging Good Economy are keeping pace, racing us toward an optimistic, high-growth economic future.

This race is being played out through four major forces shaping the American future:

- Demographics
- Technology
- Climate
- Political Dynamism

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[80] Lawrence F. Katz and Robert A. Margo, "Technical Change and the Relative Demand for Skilled Labor,", 48.
[81] *See also* Amar Bhidé, "The Demise of US Dynamism is Vastly Exaggerated—But Not All is Well," Working Paper, Center on Capitalism and Society, Columbia University, January 2015, http://capitalism.columbia.edu/files/ccs/workingpage/2015/amar_bhide_working_paper_84_demise_of_dynamism.pdf.
[82] Claudia Goldin and Lawrence F. Katz, *The Race Between Education and Technology* (Belknap, Harvard, 2008).

These forces are probably obvious (when have demographics *not* been a social and economic force?), and they're the same forces examined by Gordon and Tyler Cowen and others. Gordon and Cowen are much more pessimistic than we. But before discussing how certain institutional innovations and adaptations can lead to a brighter future, let's dive deeper into each of these four forces and their implications for which future wins the race.

Demographics

The United States is experiencing several major demographic trends at once. Overall, we are an aging country, driven principally by longer lifespans and the movement of the baby boom generation into its sixties and seventies. At the same time, American population growth has in general slowed, with a falling fertility rate among both native-born and immigrant Americans. The Great Recession slowed immigration into the United States, particularly from Mexico, and as the traditional source countries for American immigrants also experience slow population growth, the migration calculus may change.[83] At the same time, the country is in the midst of a "diversity explosion" that is rapidly changing the character of the population—the young and large millennial generation is much more diverse than the aging baby boom generation.[84] This is opening up some potentially serious cultural and generational gaps.[85]

An aging, slow-growing but diversifying country with bright generational lines presents a very different context for the education-technology race than the prior two centuries. Demographic change will challenge social insurance programs, employment law, and other areas, but also present new opportunities for innovation and entrepreneurship. It thus demands new institutional innovations; we cannot rely on our existing education, labor market, and policy institutions for successful adaptation and adjustment.

We are in a race between a future in which we do not adapt to demographic changes or perceive them only as liabilities, and a future wherein we turn demographic trends into opportunities for innovation and growth. We have the ability to determine the winner of this race.

Technology

Earlier, we discussed some of today's most exciting areas of technological change, from the spread of smartphones to the rise of cloud computing and the Internet of Things. Other observers also talk about the "creative disruption" from the sharing economy and new online services.[86] The level of anxiety about technological unemployment speaks to the impact that technology will continue to exert in the near future.

Today, this technological disruption is closely associated with exciting startups like Uber and TaskRabbit and a surge of venture capital and angel investments into them. Additionally, new sectors like mobile applications are identified with entrepreneurship. Paradoxically, however,

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[83] *See, e.g.*, Philip Auerswald and Joon Yun, *Depopulation: An Investor's Guide to Value in the Twenty-First Century* (Palo Alto Institute, 2014).
[84] William H. Frey, *Diversity Explosion: How New Racial Demographics are Remaking America* (Brookings, 2015).
[85] Paul Taylor, *The Next America: Boomers, Millennials, and the Looming Generational Showdown* (Public Affairs, 2014).
[86] Bank of America Merrill Lynch, "Creative Disruption," April 2015.

there are some indications that, at this stage in the information technology revolution, incumbent companies are becoming more entrenched and even better protected against competition than smaller and younger companies.

We spoke earlier about a new type of symbiosis between old and young companies. For overall economic dynamism, this kind of structure matters—by structure we mean the mix of enterprises that make up the economy. Some countries have economies dominated by large, old incumbent firms. Others have lots of smaller companies but with little growth.[87] Historically, the United States has enjoyed a productive balance, with a steady pace of new business creation, a minority of fast-growing firms, and large, established yet productive corporations. Comparing the United States to other countries, we find that the United States tends to have *more* employment in larger companies than other countries, but also enjoys a sizeable contribution—in jobs and innovation—from young, high-growth firms. And virtually all net growth in jobs comes from smaller, younger, fast-growing firms.

This dynamic has underwritten productivity growth for decades, but it has changed over the past two decades. Indeed, "there is now robust evidence, from multiple data sources using a variety of indicators, of a pervasive decline in U.S. business dynamism over the last several decades."[88] The rate of business entry has fallen—creating a "startup deficit"—and the share of employment accounted for by America's oldest and largest corporations has risen.[89] Even more worrisome, the "skewness" of America's economic structure—with a small number of young, high-growth firms driving most of the country's job creation—seems to have flattened, especially since the year 2000, and including in the high-tech sector.[90] Even in new sectors that are closely identified with entrepreneurs, such as mobile apps, there appears to be some incumbent bias.[91]

For economic dynamism to rebound, these recent changes in economic structure cannot continue. Yet we believe that they are partly a function of technological change and, as such, are a phenomenon of transition to a more entrepreneurial economy. As technology diffuses beyond the initial "bang" of invention to deployment, and as more individuals and businesses across sectors

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[87] *See, e.g.*, Flavino Calvino, Chiara Criscuolo, and Carlo Menon, "Cross-Country Evidence on Start-Up Dynamics," *OECD Science, Technology, and Industry Working Papers*, 2015/06 (2015). See also the paper by Criscuolo in this volume.

[88] Ryan A. Decker, John Haltiwanger, Ron S. Jarmin, and Javier Miranda, "Where Has All the Skewness Gone? The Decline in High-Growth (Young) Firms in the U.S.," National Bureau of Economic Research, Working Paper 21776, December 2015.

[89] See Ian Hathaway and Robert E. Litan, "Declining Business Dynamism in the United States: A Look at States and Metros," Brookings Institution, May 5, 2014, http://www.brookings.edu/research/papers/2014/05/declining-business-dynamism-litan; and Hathaway and Litan, "Declining Business Dynamism: It's for Real," Brookings Institution, May 22, 2104. http://www.brookings.edu/research/papers/2014/05/22-decline-business-dynamism-is-for-real-litan-hathaway.

[90] Kauffman Foundation, "Toward America's New Entrepreneurial Growth Agenda," State of Entrepreneurship, February 2014, http://www.kauffman.org/~/media/kauffman_org/research%20reports%20and%20covers/2014/02/state_of_entrepreneurship_address_2014.pdf.

[91] Timothy F. Bresnahan, Jason P. Davis, and Pai-Ling Yin, "Economic Value Creation in Mobile Applications," in Adam B. Jaffe and Benjamin F. Jones (eds.), *The Changing Frontier: Rethinking Science and Innovation Policy* (Chicago and NBER, 2015).

experiment and learn how to use, say, the Internet of Things, for value creation, we expect to see a corresponding increase in entrepreneurship.

The forces of demography and technology also carry major implications for education and skills. The "high school movement" arose and spread as a response to new skill demands and the increasing automation of agricultural work that, until then, had employed most Americans. People often deride the current structure of the educational system as "industrial"—and it is, for good reason. Our current K-12 system was, quite literally, created to prepare people for an industrial economy.[92] And, just as an "industrial" educational system was required by a newly emerging industrial economy, a new educational system is now necessary to help Americans adapt and thrive in a changing economy.

The current structure does not fit an aging and diversifying population, which simultaneously calls for more lifetime learning opportunities and more experimentation with delivery models. The changing nature of work demands new skills and it puts individuals much closer to market transparency—when an app or on-demand service can immediately measure the economic utility or value you have created (or destroyed), that calls for a different set of skills than when you're receiving internal feedback within a large corporation. And technological change, in accordance with historical patterns, is creating new skill opportunities.

We are in a race between a future in which technology creates mass unemployment and further stratification, and a future in which technology generates further abundance and broad-based innovation. The winner of this race is not foreordained, and is up to us.

Climate Risk

For the most part, debates about climate change have not figured at all into macroeconomic debates. Yet the effects of a changing climate are increasingly becoming economic. More scientists are studying, and finding, links between global climate change and local weather extremes, such as droughts and heat waves.[93] In turn, these effects are being linked to economic effects in the form of lower agricultural output, lost jobs, mortality, and lost productivity. If these costs begin to look at all significant they will have to be included in macroeconomic models.

Moreover, we will probably not simply see the adjustment of the climate to a new stable condition. The new Paris Accord was a significant global agreement but at best—if the voluntary plans of 180 nations are met—it only slows down the increase of greenhouse gas emissions. And as long as greenhouse gas emissions keep growing, the economic effects and costs will continue to grow. This is the reason why many climate scientists support the Paris Accord and simultaneously believe privately that the accord's goal of holding future temperature increases to no more than two degrees Celsius is no longer possible.

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[92] Claudia Goldin and Lawrence F. Katz, *The Race Between Education and Technology* (Belknap, Harvard, 2008).
[93] "Is it global warming or just the weather?" *The Economist*, May 9, 2015, http://www.economist.com/news/international/21650552-scientists-are-getting-more-confident-about-attributing-heatwaves-and-droughts-human.

This is why we now believe it essential that all of our measures of macroeconomic progress always include a climate risk indicator. The contemporary economic policy debates focus on a number of dire macroeconomic possibilities: another Great Recession, vast technological unemployment or underemployment; or the end of growth as examples. We doubt if any of these possibilities involve as much risk as the risk of climate disaster we are now running in blissful or willful ignorance.

To believe that the 2 degree limit is achievable requires one to believe in the possibility of cutting carbon dioxide emissions by 80 percent by 2050, a goal possible only if all carbon-fired electricity-generating plants are shut down and the vast majority of conventional cars *around the world* are replaced by full-blown electric cars. This possibility is beyond remote. Therefore the probabilities are that we will see during the next twenty-five years—precisely as the Good Economy is developing—a climate and temperature trajectory toward a point well above the 2 degree Celsius limit.

But to what point? Moderate pessimism regarding the likelihood of extreme measures limiting emission increases, let alone measures reducing emissions, would suggest we are now on—and will stay on—a greenhouse gas emission track running past a level of 700 parts per million (ppm) by 2100 unless the world takes immediate and substantial steps to cut manmade CO2 output. The "moderately pessimistic" scenario entails a 66 percent probability of a global temperature increase between 1.5 and 4.5 degrees Celsius over the next century. That doesn't seem like much but it would create a higher global temperature than the world has seen in three million years and, as Wagner and Weitzman emphasize: "This alone would be a profound, earth-as-we-know-it altering change."[94]

That's the direction in which we're headed. But any general statement about the *average* or *median* increase in global temperature to expect doesn't account for the fact any such increase will not be experienced in an average way. Mathematically, as the possible median temperature increase rises, the possibilities of what are called "tail risks" rise disproportionately. Then, chances of ocean level rises, extreme storms, droughts, and major forest fires are *much* greater as global temperatures rise even beyond the current unrealistically low targets. And as we write this, the newest analyses of Antarctic ice suggests it is melting at a far faster rate than expected, threatening a much faster rise in sea levels than expected.

In short, the true climate risk problem lies in what are called "fat-tail" risks—these exist at the very edge of a distribution, and are risks that one would normally discount. But, the odds of fat-tail risks rise when the median value of the distribution rises: "what happens at the very extremes—the tails of the distribution—may dwarf all else." Taking this kind of risk seriously and then calculating probabilities lead Wagner and Weitzman to conclude there is a 10 percent chance that global temperatures would be 6 degrees Celsius or 11 degrees Fahrenheit higher. This is, in Wagner and Weitzman's words, a "blind planetary gamble."[95]

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[94] Gernot Wagner and Martin Weitzman, *Climate Shock: The Economic Consequences of a Hotter Planet* (Princeton, 2015).
[95] Wagner and Weitzman, *Climate Shock*.

We would rather not see the world take a blind planetary gamble, nor do we believe that most Americans, or citizens of the world, when confronted with the realities, would want to take such a gamble either. We also think that 10 percent probability risks cannot be discounted; they are precisely the kinds of events that people in the private sector, whether in business or in their personal life, insure against all the time. Nations adopt insurance policies for their citizens on essentially the same theory and having insurance to protect against bad outcomes in life should not be controversial or partisan.[96]

We are in a race between a future in which climate change continues unabated and causes economic and social disruptions, and a future in which climate change is managed through adaptation, innovation, and governance. We can choose the winner of this race.

Political Dynamism

This major force, of course, also comes along with a tagline: *or the lack thereof*. It's no secret to anyone that "political dynamism" has been noticeable mostly by its absence in Washington over the past decade. (Some people might extend the period of absence back even further.) Polarization between the two parties has reached unforeseen levels and it often seems like little of consequence gets done at the federal level.[97] In his last State of the Union address in January 2016, President Obama stated that increased political polarization and rancor was one of his few regrets.

As a result, many observers have thrown their hands up and turned instead to the states and cities. The "metropolitan revolution" in terms of economic activity has prompted some to call for mayors to "rule the world."[98]

It's true that cities and metros are the seat of many of the trends we have highlighted: they are the frontlines of demographic and technological change. In a world of instant electronic communication, physical proximity and urban networks matter more than ever. Cities are particularly important for the new business system we see emerging with high rates of entrepreneurship, intense dynamism, and a high need for new learning institutions (see below). Cities and metros also happen to be the places where entrepreneurs face many barriers, whether that is the cost of space (office and housing) or entry barriers (such as licensing, permitting, etc.).

Cities offer the promise of being the new "imaginarium" described by Edmund Phelps, but allowing them to fulfill that role will require changes in the legal relationship between cities,

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[96] Highly regarded jurist and prolific author Richard Posner recognized this over a decade ago in his book, *Catastrophe: Risk and Response* (Oxford, 2004).

[97] For polarization data, see http://voteview.com/political_polarization_2014.htm, where University of Georgia political scientist Keith Poole maintains a collection of his data and graphs. See also Christopher Hare, Keith T. Poole, and Howard Rosenthal, "Polarization in Congress has risen sharply. Where is it going next?" *Washington Post*, February 13, 2014, https://www.washingtonpost.com/news/monkey-cage/wp/2014/02/13/polarization-in-congress-has-risen-sharply-where-is-it-going-next/.

[98] Bruce Katz and Jennifer Bradley, *The Metropolitan Revolution: How Cities and Metros are Fixing Our Broken Politics and Fragile Economy* (Brookings, 2013); Benjamin R. Barber, *If Mayors Ruled the World: Dysfunctional Nations, Rising Cities* (Yale, 2013).

states, and the federal government. It will require new legal institutions at the city and regional level to improve and enhance local political dynamism. We discuss these below.

Nevertheless, the federal government will and must retain an important role in economic dynamism, the corollary of which is "political dynamism." Lee Drutman of the New America Foundation writes that political dynamism is found in:

> A political environment that is fluid and open, where barriers to entry are comparatively low. This is an environment in which "policy entrepreneurs"—the key drivers of policy change—are likely to thrive and engage in innovative acts of "creative policy destruction" that clear away old rules that unfairly protect and benefit previous economic winners—the "rent seeking" policies so destructive to economic growth and innovation and entrepreneurship. Just as with economics, political rules that decrease barriers to entry and increase competition also incentivize new ideas, stimulating creative thinking and innovation. Political dynamism is the product of rules that allow a certain degree of fluidity, enough for new entrants and new ideas to gain traction.[99]

It should be apparent from this definition how closely intertwined political and economic dynamism are: economic rent seeking begets political stasis begets economic stasis and so on.[100] By their nature, larger, older, and more established companies tend to favor the status quo—after all, they are the creators and beneficiaries of that status quo. They are highly bureaucratic, often resembling governments every bit as much as market-facing private sector businesses. They are intensely political, both internally and externally. They provide most of the fuel for Washington's enormous lobbying industry. Only the largest companies are able to support dedicated Washington offices or to engage independent lobbying firms. The job of those manning these offices and firms is naturally to be ever vigilant against possible policy innovations and change, which might harm their companies or clients.

Yet the absence of political dynamism in Washington also reflects something else, something that *must* be addressed for the United States to realize the Good Economy. There has been an almost complete loss of "fiscal freedom" at the federal level.[101] In the aftermath of the Great Recession and the trillion-dollar stimulus package, outrage at federal deficits fueled the rise of the Tea Party and set the stage for annual fights over the debt ceiling and government funding. Relative to GDP, the growth of federal debt has tailed off—for now and possibly for the next decade—but remains near seventy-year highs. While the likely flattening of the debt-to-GDP ratio over the next decade may have taken some pressures off lawmakers in the short-term, the long-term growth of the debt-to-GDP ratio driven by the inexorably rising costs of entitlement programs for baby boom retirees, if not eventually addressed, threatens the realization of the Good Economy.[102]

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[99] Lee Drutman, "Political Dynamism," Working Paper, New America, March 2015.
[100] Steven M. Teles, "The Scourge of Upward Distribution," *National Affairs*, Fall 2015.
[101] C. Eugene Steuerle, *Dead Men Ruling: How to Restore Fiscal Freedom and Rescue Our Future* (Century Foundation, 2014).
[102] Rudolph G. Penner, "The Changing Nature of the Long-Term Federal Budget Problem," *Business Economics*, July 2015.

Moreover, the rising costs of the two largest entitlements—Medicare and Social Security—are crowding out what little is left of federal discretionary spending programs to meet the challenges that the Good Economy will require to be met: more investment in education, basic science, and a new, cleaner infrastructure. Eventually, the gridlock in Washington must change for the Good Economy to come about, although more effective and less polarized government at the local level can make things easier.

We are in a race between a future in which lack of political dynamism reinforces declining economic dynamism, and a future wherein renewed political dynamism at all levels supports the emerging Good Economy. We can choose the winner of this race.

What Wins the Race?

Our analysis thus far has looked at the drivers of frontier-expanding growth, reasons for economic pessimism, emerging trends that point toward the Good Economy, and major forces that will shape the Good Economy. The Good Economy, we believe, is the adjacent possible—it is emerging and developing, but will require intentional actions to open the doors to it. And, the Good Economy is in a race for the future, a race with a low-growth, stratified, and stagnant economy. If our analysis is even halfway correct, what kind of policy steps must be taken to win the "race" between the two possible futures of the Good Economy and the end of growth?

Work

Because of dislocations in the labor market created by technology and demographics, and the resulting inequalities, policy needs to be more oriented toward encouraging work.

- ➢ Payroll taxes should be reconsidered or at least reduced, and serious consideration should be given to value-added taxes. (This, obviously, would confound the federal budget issues.)
- ➢ Raise and index the Earned Income Tax Credit (EITC). The EITC has been one of the most successful anti-poverty and work-encouraging policies in history. It has proven to increase participation, hours, and earnings. Raising and indexing the EITC will help alleviate some of the disparities that have widened at the bottom of the income distribution.[103]
- ➢ Wage support, as proposed years ago by Edmund Phelps, would give companies some support for employing low-productivity workers. Despite the rhetoric around the minimum wage, employers are not evil—they are attempting to run profitable businesses. Attempts to recruit them to fulfill social and economic policy goals require assistance.
- ➢ On the demand side of work, this country badly needs immigration reform. That much is obvious. Whatever may happen in Washington with immigration, we hope three provisions are included.

[103] *See, e.g.*, Raj Chetty, "Behavioral Economics and Public Policy: A Pragmatic Perspective," *American Economic Review,* May 2015.

- First, it's finally time to create a real startup visa, one that has low thresholds for application and that brings in a wide range of immigrant entrepreneurs. They will make jobs, not take jobs, for Americans.
- Second, the H-1B visa should be amended to allow recipients to leave their employer and either start new companies or join young companies.
- Third, a new pathway for foreign students studying in the United States should be created that similarly allows them to start new companies or join young companies.

Dynamism and regulation

Economic dynamism has fallen in the United States over the past two decades, and part of the explanation may be growing regulation—specifically, regulation that favors incumbent companies over new and young firms. Government regulation is often treated as monolithic by both sides of the political aisle. More regulation is good! More regulation is bad! In truth, regulation is sometimes sought by incumbent companies as a way to protect their market position and keep out competitors.[104] Subsidies to incumbents (both large and small) are bad for innovation and growth because they suppress the process of reallocation that drives productivity.[105]

At the same time, it's not necessarily clear that exemptions and support for *small* businesses are effective for fostering job creation, firm growth, and innovation. Time and again, research finds that *new* and *young* and especially *young, high-growth* companies are the source of employment growth and innovation.[106] In particular, the *reallocation* process of resources (like people) from low-productivity to high-productivity companies is a principal source of productivity growth. Thus, regulation that privileges incumbents (large or small) and prevents that reallocation process is bad for growth.

- ➢ Regulation needs to be made to work for new entrants and young firms, not incumbents. Barriers to entry must be lowered. The playing field between entrants and incumbents needs to be leveled.
- ➢ This can be accomplished either directly (by exempting young companies, rather than small companies, from some regulations) or indirectly (by reducing incumbent protection across the board).
- ➢ A regulatory review process carried out by all levels of government should include consideration of the impact on entry and reallocation. One way to clean out outdated and counterproductive regulations is to appoint independent bodies of experts to

[104] James Bailey and Diana Thomas, "Regulating Away Competition: The Effect of Regulation on Entrepreneurship and Employment," Mercatus Center, Working Paper, September 2015.
[105] Daron Acemoglu, Ufuk Akcigit, Nicholas Bloom, and William R. Kerr, "Innovation, Reallocation and Growth," National Bureau of Economic Research, Working Paper 18993, April 2013.
[106] Ryan Decker, John Haltiwanger, Ron Jarmin, and Javier Miranda, "The Role of Entrepreneurship in US Job Creation and Economic Dynamism," *Journal of Economic Perspectives*, Summer 2014.

identify them, and then to have legislatures hold up or down votes on the entire packages, much as the federal government has done with military base closures.[107]

- ➢ A change in the nature of antitrust enforcement may also be needed. In many industries, the dominance of incumbent companies appears to be supported by antitrust law to the detriment of young companies. Organizations like the American Antitrust Institute have been looking at how antitrust law can take the promotion of entrepreneurship into consideration in antitrust enforcement.
- ➢ Regulators should also adopt a presumption of permission toward institutional innovations around Good Economy trends like gig work and labor market entry. Experimentation at the state and city levels with different modes of regulation should be encouraged and evaluated. For example, changing demographics may mean that amendments to the Family and Medical Leave Act (FMLA) are needed to assist workers in their attempts to balance work and family.
- ➢ Employment law may also need to be reconsidered. Currently, W-2 employment is considered superior to any other type of arrangement, and federal laws around benefits and health insurance reinforce this superiority. But, a dynamic economy that encourages reallocation of resources across firms and geographies and a high rate of labor market churn is not helped by policies that give preference to fixed employment over other forms. Some people have suggested a new "dependent contractor" status to capture those, like Uber drivers, who straddle the line between employee and independent contractor. That may strengthen dynamism and mobility, but we should also rethink our entire legal and policy approach to employment law and the incentives it sets in place.
- ➢ Last autumn, in 685 pages, the Securities and Exchange Commission (SEC) approved rules for what's known as retail crowdfunding. Three-and-a-half years after Congressional authorization, the SEC removed the final barrier to a non-accredited investor taking equity in companies through crowdfunding platforms. Part of the explanation for the time and length it has taken is the SEC's understandable concern over fraud.[108] Many expect that the SEC's rules will themselves be too cumbersome to allow retail or equity crowdfunding to fully flourish. While we have our own concerns and doubts over the economic impact of crowdfunding, its ultimate fate should be worked out in the market, not regulators' hands. With appropriate levels of protection for fraud, we hope the SEC allows crowdfunding to work and, if the new rules prove too restrictive, liberalization should occur.

Cities and metros

Closer government is not always better government, but America's cities and metros are the principal location for technological change, innovation, and many of the challenges facing the

[107] Michael Mandel and Diana J. Crew, "Regulatory Improvement Commission," Progressive Policy Institute, May 2013, http://www.progressivepolicy.org/wp-content/uploads/2013/05/05.2013-Mandel-Carew_Regulatory-Improvement-Commission_A-Politically-Viable-Approach-to-US-Regulatory-Reform.pdf.

[108] And, fraud has already occurred within the equity crowdfunding space for accredited investors. JD Alois, "The First Investment Crowdfunding Fraud. What does this Mean for the Industry?," Crowdfund Insider, December 2, 2015, http://www.crowdfundinsider.com/2015/12/77955-the-first-investment-crowdfunding-fraud-what-does-this-mean-for-the-industry/.

country. They should be given freer reign to experiment with different approaches, but changes are also needed in how local governments deal with things like housing and firm formation.

- In 2011, the United Kingdom adopted something called City Deals as a way to "empower cities and their metropolitan areas to drive local economic development."[109] In the United States, Bruce Katz has suggested Metro Deals, which would alter the nature of federal funding to cities. Metropolitan areas would get more control over federal money and the ability to tailor the use of that money to local needs and experiments.
- Despite the challenges that continue to face federal regulation (discussed above), the federal government has made enormous progress on engaging in rigorous cost-benefit analysis of new regulations and a "regulatory lookback" that evaluates existing regulations.[110] States and cities, however, have no similar capacity. Because innovation and entrepreneurship and technology can be significantly affected by state and local regulation, we endorse an idea proposed by Edward Glaeser and Cass Sunstein for states to create regulatory review commissions.[111]
- Since many cities cannot afford their own regulatory review commissions, they should be assisted in their regulatory review efforts by philanthropic efforts and a redesigned Department of Housing and Urban Development (HUD, see below) to fund new types of measurement and data collection that allow localities to compare themselves against other cities. Something like the *Doing Business* indicators that the World Bank has created at the global level would be ideal for American cities and metros.
- Greater investment in infrastructure is also needed. Yet the federal government has proven itself to be dysfunctional on this score and, in fact, threatens to disinvest in infrastructure. Metros and regions should have the ability to create and finance their own infrastructure banks, provided they also take measures to reduce the red tape that slows infrastructure design and construction.[112]
- The federal government can also help American cities and metros by adopting a new mission for HUD. HUD should be the champion of the emerging Good Economy at the city and regional level. It should assist with Metro Deals and regulatory review commissions and help create the urban infrastructure banks.
- Change also needs to occur with how local governments approach land use. A growing number of experts has pointed to the paradox that our most productive places—such as San Francisco and Boston—have much lower population growth than our least productive places. The biggest reason is that restrictive land-use policy makes it incredibly expensive to live in the highly productive places. Economic estimates for what would happen if land use were liberalized in these places run into the billions of dollars. But how to go about it while respecting the desires of local residents? Law

[109] Bruce Katz and Jennifer Bradley, *The Metropolitan Revolution: How Cities and Metros are Fixing Our Broken Politics and Fragile Economy* (Brookings, 2013).
[110] Edward Glaeser and Cass R. Sunstein, "Regulatory Review for the States," *National Affairs*, Summer 2014.
[111] Glaeser and Sunstein, "Regulatory Review for the States."
[112] Legal reform in this area has been tirelessly and effectively promoted by Phillip Howard. See this essay on the website of the organization he chairs, Common Good: http://www.commongood.org/blog/entry/common-good-chair-proposes-grand-bargain-in-essay-for-the-atlantic.

professors Roderick Hills and David Schleicher have sensibly suggested that local governments adopt annual "zoning budgets" that remove the disincentives for growth and seek to balance the supply and demand of land for new construction.[113] The goal would be for more allowable growth at the local level, without running roughshod over local interests.

Federal government

We have already discussed several areas where the federal government can take action or assist states and cities in fostering the Good Economy. Three other areas should be addressed.

- ➢ Deficits are now built into the system, yet without the means to pay for them. This is unsustainable. That much is obvious to everyone. But, as Gene Steuerle has argued, unsustainable deficits are a *symptom*, not a cause—in particular, they are a symptom of falling fiscal freedom.[114] The United States has apparently made the collective decision to build in automatic (mandatory) spending increases for health care and retirement programs—we do not, however, have such mandatory increases for things like defense and education. This distinction marks our national priorities. The country will be unable to address new challenges and help foster the emergence of the Good Economy when a rising share of the federal budget is tied up in these mandatory programs. Changing this structure will be far from easy—particularly given demographic realities—but there is no other option.
- ➢ The National Economic Council (NEC), Council of Economic Advisors (CEA), Department of Commerce, and Small Business Administration (SBA) should alter their missions to include monitoring growth at the economic frontier. Technological disruptions, the changing nature of work, and the importance of new, young, and high-growth companies should all be core elements of their revamped missions.
- ➢ The bully pulpit of the President should make room for entrepreneurs. President Obama, through programs like the Startup America Partnership and Global Entrepreneurship Summit, has made entrepreneurship a national priority. Republicans and Democrats on Capitol Hill have co-sponsored various versions of a "Startup Act" on multiple occasions. Their continued attention to young companies, as well as a greater understanding of the changing nature of work, will help focus on these trends.
- ➢ Since the 1920s, the federal government has served as the primary statistical agency for the country. Yet the statistics we primarily rely on today—including GDP and productivity—were developed in a very different economic context. The Census Bureau has made enormous strides in recent years in collecting and publishing more detailed data, especially on American business. Additional funding for data and statistics may seem to be the least likely thing for the Good Economy (and the least sexy for Congressional consideration), but better data makes for better policy. We need to improve the existing indicators (GDP, productivity), and generate more detailed,

[113] Roderick M. Hills Jr. and David Schleicher, "Balancing the 'Zoning Budget," New York University School of Law, Public Law & Legal Theory Research Paper No. 11-19, April 2011. Schleicher has also suggested changes in the voting rules of local governments that could accomplish the same ends. See David Schleicher, "City Unplanning," *Yale Law Journal*, May 2013.

[114] Steuerle, *Dead Men Ruling*.

real-time, and localized data on economic dynamism, labor market churn, the nature of work, learning, and other areas.

Learning

From Pell grants to the 401(k), the experience of consumers from youth to death remains framed by the notion that institutions are sufficiently slow-changing and we are sufficiently short-lived that we can invest (one-time only) in education at the front of our lives to reap a reward that we ultimately enjoy at the end of life. Predictable and familiar policy prescriptions follow.[115]

It has become conventional to say it, but few things matter more for national prosperity and the realization of the Good Economy than educated and skilled workers. President Bill Clinton perhaps put it best when he said, repeatedly: "you earn what you learn." Yet we've arrived at a moment when some fairly large-scale changes are needed in our approach to education, training, and learning.

In 2017, the federal government will start spending more on interest payments than it does on investments in children. Already today, per-person federal spending on the elderly is six times higher than on children.[116] Since the 1960s, the United States has made enormous progress in improving the living standards, retirement security, and care for elderly citizens. Trends such as longer lifespans and rising labor force participation among older workers have risen in tandem. This has not been costless, as it has apparently come at the expense of spending on children. That is partly understandable, of course: the elderly have much higher health-care requirements and costs, and cannot rely on the care and support of parents.

Today, however, disparities in childhood are exacerbating the differential effects of technological change. The Social Genome Project at the Brookings Institution has concluded (as have others) that children of poor families have a much lower probability of later economic success in life than children of middle-class families.[117]

➢ More public and private investment is needed in "interventions" that have been proven to work in closing those disparities. These interventions—which include universal preschool, sustained and targeted mentoring, home visits, and others—have been shown to have high returns as measured by income and educational attainment.[118] There is, to be sure, much more work to be done on the efficacy of different types of early childhood education but, without these investments, we are leaving millions of dollars on the table in the form of wasted human capital.

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[115] Philip E. Auerswald, "The Great Man-Machine Debate," Paper prepared for Kauffman Foundation, New Entrepreneurial Growth conference, June 2015.
[116] Steuerle, *Dead Men Ruling*.
[117] Isabel V. Sawhill and Quentin Karpilow, "How Much Could We Improve Children's Life Chances by Intervening Early and Often," Brookings Institution, Center on Children and Families, March 2015, http://www.brookings.edu/~/media/research/files/papers/2014/07/improve_child_life_chances_interventions_sawhill/improve_child_life_chances_interventions_sawhill.pdf
[118] Sawhill and Karpilow, "How Much Could We Improve Children's Life Chances by Intervening Early and Often."

- ➢ The second learning priority should be lifelong learning. The existing educational system is already under assault by entrepreneurs and new technologies that seek to unbundle education and turn it into a series of mini-courses or "stacks" of credentials. More innovation will be needed to expand these offerings across the age spectrum and make them especially relevant for middle-aged workers. A new system of lifelong learning will emerge through organizational competition and experimentation. Community colleges, trade associations, credentialing and accreditation organizations, corporations, and so on will all engage in this experimentation. The stance of government here should be to open up the educational system to this competition and knock down barriers that protect incumbents.
- ➢ High schools must adapt—they are the critically important fulcrum between testing-riddled elementary and middle school, and colleges and universities that are, for the first time, required to justify their costs. We agree with many observers that a resurrection of vocational education is needed to build more skills and pathways to jobs.[119] High schools, though, need to find ways to expose their students to more career options and inform them about the changes (many of them exciting) taking place in the labor market. A former colleague of ours, Sam Arbesman, has suggested that the senior year of high school (which is educationally worthless in many places) be converted into an exploratory year for students.

Climate

In one form or another, the United States needs to take out insurance, as it were, against the potential damaging impacts of climate change. This need not be onerous or distortive, and it could provide a net economic benefit. And, the reality of where we find ourselves is that there seems to be little hope of limiting global carbon emissions in order to keep global temperatures from rising by two degrees. While efforts should be made to limit emissions, the most feasible course now is adaptation. But, we are hopeful: humans have always adapted to changes in climate and weather. Indeed, the history of such adaptations provides "considerable optimism about the future responsiveness of the society to the important challenges of a climate that may change in unknown ways … [and] provides reasons for confidence and expectations for creativity" in that responsiveness.[120]

- ➢ A price must be put on carbon, whether through a tax or some other equivalent mechanism.
- ➢ There should be new construction of seawalls around major cities along East and Gulf coasts. This will cost billions of dollars, but will create construction jobs and save money on disaster cleanup.
- ➢ Along the coasts, flood insurance should be compulsory and, through local zoning laws, construction near the ocean should be made more difficult. (We acknowledge that this suggestion runs in direct contravention to our advocacy above for liberalized land-use law in general.)

[119] Robert Schwartz and Nancy Hoffman, "Pathways to Upward Mobility," *National Affairs,* Summer 2015.
[120] Gary D. Libecap and Richard H. Steckel, "Climate Change: Adaptations in Historical Perspective," Gary D. Libecap and Richard H. Steckel (eds.), *The Economics of Climate Change: Adaptations Past and Present* (Chicago, 2011).

- ➢ There must be greater investments in disaster preparedness and recovery.
- ➢ In drought-prone areas, value-based pricing for water should be instituted.
- ➢ Despite it being enormously controversial, small-scale geo-engineering efforts should be explored. Activities like blocking solar radiation or sucking carbon out of the atmosphere sound like science fiction, but efforts are already underway. Because of their mix of promise and uncertainty, however, we urge that geo-engineering experiments proceed at a small-scale level before being adopted on a much larger scale.

Chapter 6: Concluding Thoughts

We began this book asserting that there is an optimistic but plausible case for the development of a "good" economic future over the next twenty or thirty years. We defined *The Good Economy* as one with a higher rate of overall growth than we have seen in recent decades or that most economists expect, and one that provides greater opportunity and equity as *outcomes of its own logic and structure* than most believe are likely if we simply continue on our present course.

Successfully realizing the Good Economy will be better for everyone than the markedly worse alternatives that are expected. Yet the political economy of getting from here to there remains uncertain.

A substantially higher rate of overall growth of the economy—higher than the past thirty years, and higher than most project for the future—is entirely possible and even likely. We reach this conclusion through a distinctly different appreciation of the strength and importance of the technological revolution we are in the middle of, and through an equally different sense of what economic growth is and what nurtures it.

Today's technological revolution—in broad terms, the ongoing explosion in the fundamental power of information technology—will drive economic change and growth as much or more than the earlier revolutions of steam power, the internal combustion engine, and electricity which drove the Industrial Revolution. Our sense is that today's technological revolution has followed a now recognizable course.

At first, this technology was put to work doing old tasks in new ways: most early computers did clerical tasks. Then as the technologies grew in power they began to do new tasks. And now *the technologies have morphed into completely new forms that function in combination, and create entirely new systems or paradigms.* We find it very hard to overstate the economic importance of the Internet (a new form); or the Internet of Things (a new combination); or the Internet of Things linked to 3-D printing in manufacturing (a new system). Nor do we think that the smartphone can be described as anything less than a profoundly valuable consumer good. These new combinations and paradigms will drive out the production frontier of our economy for a very long time.

Which brings us to a very different understanding of growth. We have not paid much attention to the normal growth arithmetic—adding up various marginal sources of productivity—because we believe that these elements of growth arithmetic are results not causes. To understand the sources of growth we have gone back to an older tradition of economics and to its modern proponents to ask: what actually makes growth happen? In doing so, we have, probably inadequately, canvassed the work of Alfred Marshall, Joseph Schumpeter, William Baumol, Edmund Phelps, and Deirdre McCloskey to argue that growth that drives outward the frontiers of an economy is very different than growth that involves reaching a given frontier. The key elements of frontier-expanding growth are a high rate of *innovation* made possible by technological change; a large supply of *entrepreneurs and new businesses* to put the technology into economic form; and a *nurturing environment* that we (quoting Phelps) called *dynamism* that supports new ideas, innovation, and entrepreneurs. We think that the implication of this triad of technology,

entrepreneurs, and environment is binary: if you have all three, you get frontier-expanding growth; if you don't, you don't. We believe this triad exists or can exist today.

Some very smart people disagree with us, and so does the canon of modern economics. They may be right but we should recognize they are all arguing from different premises. When asked what growth will be over the next decade, most economists interpret the question as how will *today's* economy grow? We agree with their answer to that question: today's economy is mature and sclerotic and cannot grow very rapidly. If an economist steeped in the agrarian pre-industrial economy of England in 1750 had been asked the same question, he would have projected out the trends of 1750. But we believe we are in the midst of a fundamental change to a different economy—one that can and will grow more rapidly.

Which brings us to our second theme—*the idea of a new and different system.* We argue that big economic change is not a matter of a couple of elements changing in isolation from each other. But, rather of one system—of production, of work, of organization, of governance, and of politics—changing to another. McCloskey was pointing this out when she argued that a major factor in the kick-off of economic growth in the late eighteenth century was ideas.

And we believe that we are seeing a system change of a similar magnitude happening before our eyes. We argue that the *factory system* that had characterized the modern economy for at least a century is changing to a completely new system with new approaches to production, work, organization, governance, and eventually politics.

We also believe, but haven't argued explicitly, that "you can't get one without the other." We can't opt to have the benefits of the new growth, but keep the elements of the old system. What you get instead is a thoroughly worse second best. In chapter 5, we discussed the race between two futures: our current economic system will collapse to the New Feudalism scenario, a world in which 80 percent of the population is marginalized unless our *system changes.* The New Feudalism is what you get if the technological revolution –which goes on no matter what we do—is superimposed on today's production, work, organization, and governance.

There hasn't been any debate over our views of economic systems or today's economic system or the direction of system change we believe is coming. But this is because there has been almost nothing else written that tries to present a system argument. As an example, McAfee and Brynjolfsson argue for the importance of the technological change occurring now. We agree with them but they do not extend their argument to the changes they would expect in the economic system as a whole. As a rare exception we think that Tyler Cowen's *Average is Over* is making a systems argument and very clearly lays out the implications of ongoing technological change superimposed on today's system. Our view is that Cowen's world is very, very likely if our current system does not change.

Our sense of the importance of system then brought us to our arguments regarding the *changes that were necessary* for the Good Economy. We emphasized new companies, learning, and cities.

There is an ongoing struggle between incumbents and potential new entrants, new companies: this was best described by Clay Christensen in *The Innovator's Dilemma*. Within companies there is always a fight between the old products and the new. That fight occurs at a societal level as well. New companies create the new jobs and carry out the truly profound innovation. But older incumbents possess the power and use it to squash new entrants. If the incumbents win over the next decades, then Cowen's world is the outcome.

We argue that *learning* is equally important. The emerging new system we anticipate is different and requires new capabilities and new skills. Moreover, the new system will itself see constant change. If we don't invest more in children, build a system of lifelong learning, and reorient the high school, many of our citizens will not be able to take advantage of the incredible opportunities we believe the emerging new economic system will bring. There is a difficult but ethically important policy switch that must be made here. Over the last eighty years, the major domestic public policy has been to strengthen the economic position of America's elderly. That war has been won, but is still being fought. It is time, we argue, to shift to raising the ability of the young, of our children and grandchildren, to seize the opportunities offered by the world we see coming.

We also need to find ways to further unleash the economic power of America's cities and metros and regions. These are where most of our economic output comes from, and the Good Economy is taking shape there. Building on the "metropolitan revolution" will require political changes at the federal, state, and local levels.

Finally, let's discuss *opportunity, security,* and *equity.* We believe unhesitatingly that the system we think *could* emerge is much more likely to offer more opportunity, to provide greater security, and to result in much more equity than any other system we have seen described.

The new system provides more opportunity. It grows more rapidly, it creates more jobs and work because it grows more rapidly, and it provides the learning necessary to seize the opportunity. Remember: the incumbents providing all the secure good jobs that are so desired now are cutting their numbers of employees as fast as possible.

The new system also provides more security than the current economic system can or will. It is growing more rapidly and is therefore inherently more secure overall. It is also much more dynamic, offering opportunities for entry, and change that exist less and less today. But providing security will also require, as we argue, entirely new institutions to support women and men as they develop their careers in the new economy. We believe these institutions are already emerging. Economic dynamism is like riding a bicycle: stability is better attained at faster speeds.

Finally, what about equity? We start here with three assertions. First, the super-rich will still be with us, no matter what. This is a period of vast economic change and these periods inevitably reward some set of first movers. We don't care. Second, there is a considerable amount of rent seeking in today's economy that widens inequality and artificially suppresses greater mobility. And third, we believe that the real problem of equity is to be found in the bottom third of the income and wealth distribution. The women and men caught there are for the most part victims

of transition and system failure. As David Autor has shown, information technology polarized the labor market and a large number of previously stable middle-income jobs disappeared and aren't coming back. In addition, we as a nation have failed to develop the learning institutions that would permit those of our citizenry caught in the bottom third or their kids to escape. We believe that when means exist, as Isabel Sawhill has shown, to erase most of the gap between poor and well-off kids, and we do not grab those means, then we all have allowed a profound moral and ethical lapse.

As we have said, the problems of equity we see today are mostly issues of transition from one economic system to another. We are confident that the changes we have noted and argued for will diminish these problems. But what about the women and men caught there now? We should raise the earned income tax credit and put in place an indexation of the program. We should encourage job creation both by increasing incentives, (we have suggested wage supplements), and decreasing disincentives—we have raised the idea of ending payroll taxes and replacing them with value-added taxes and a carbon tax.

A final word on these big issues of opportunity, security, and equity. As Bruce Springsteen sang, "it's leaving and it ain't coming back." No matter how much we liked the glorious thirty years after World War II, "they ain't coming back." It is our responsibility to see the changes coming without blinders and illusions and to create the new conditions for opportunity, security, and equity that are suitable for the economic system that is emerging now.

Now let's turn to getting there, in a different sense than we asked the question in chapter 5. Then we were interested in the policies; now we are interested in the politics.

What's so hard about arguing for growth?

Let's recall Ben Friedman: "There is often a grudging aspect to the recognition that achieving superior growth is a top priority. As a result, especially when faster growth would require sacrifice from entrenched constituencies with well-established interests, the political process often fails to muster the determination to press forward."[121]

Growth in the Good Economy will mean system change. Yet that's what makes real growth policy so difficult.

Such policy requires:

- That we allow and encourage change to happen—this instantly raises the hackles of incumbents, who own the Washington lobbying enterprise;
- That we invest heavily in learning which, given the state of our national budget, will involve reducing the growth of public funds to someone who won't like it;
- That we change certain political and governance dynamics, which could mean taking away power from those who currently have it.

[121] Friedman, *The Moral Consequences of Economic Growth* ,4.

These kinds of tradeoffs are probably what Friedman had in mind when he mentioned "entrenched constituencies and well-established interests." Given the likely strength of the opposition to change and the dysfunction of our political system, normally one would conclude game-over. Moreover, the two monopoly political parties are held hostage by their bases and do not dare to move. But we think there are three factors that might help make change happen.

First, we are at one of the peak levels if not the peak level of dissatisfaction with the system. That dissatisfaction shows itself first in the success of non-establishment, even bizarre, presidential candidates in this year's campaign. But after this experiment fails, the voter might be ready for a positive vision. What kind of leader will put forward that kind of vision?

Second, we've provided a model for a future that does work. We believe that the only way one can argue successfully for major change is to provide a clear view of the end result of the change.

Third, neither major political party has an agenda or vision that addresses the core issues of our economy, or resembles even remotely our picture of the future and how to get there. We think, paradoxically, it is this fact that makes change possible. The policies we suggest are on neither party's agenda. We do not look to multiple massive government programs; we do not see where we are as the fault of those who have done well in our society; we think that business and business formation will determine if we get to the Good Economy; we want a shift of emphasis to America's grassroots; we believe that increased opportunity, security, and equity are a necessary part of the Good Economy.

The ideological boundaries are beginning to shift toward a new mix of policies and a new vision of America. Part of the "progressive" (née liberal) movement is firmly wedded to a return to the world of the 1950s; and part of the conservative movement believes that the return ought to go a great deal further back than that. But more and more scholars and policy thinkers and mayors and governors are considering policy alternatives that move in completely different directions than the current conventional wisdoms of the two parties, and of current politics. Most polling of millennials suggest a very different set of views. And there are now more voters who declare themselves as "independents" than as the other two parties combined.

If the political hegemony of the two political parties—a hegemony which is just as much a factor in blocking new thought and a new future as the corporate hegemony we've already decried—can be broken, we believe we will see a tsunami of new ideas. What looks impossible now will become feasible, as leaders are willing to raise new ideas. In that environment, we think ours will hold up well.

So there is an audience that wants something different. And there are potential leaders out there who want to be different, who want to put forward real hope for the future. We hope this essay will contribute toward a much-needed new political dialogue by that audience, conducted in a civil fashion and with less of the vitriol that has come to characterize our national politics. We hope that a few leaders consider our vision, adapt it, and start talking about it with that audience.