THE UPSIDE
of
INEQUALITY

HOW GOOD INTENTIONS UNDERMINE THE MIDDLE CLASS

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INTRODUCTION

I wrote *Unintended Consequences* in 2012 because I was concerned that in the aftermath of the financial crisis misguided economic policy would lead to slower-than-necessary growth. The financial crisis had called the value of free enterprise into question in the mind of the public, and I wanted to set the record straight.

The U.S. economy had grown robustly for nearly two decades leading up to the financial crisis. But the U.S. economy ran enormous trade deficits with China, Germany, and Japan—economies with large surpluses of risk-averse savings. These economies used risk-averse savings to fund large trade surpluses that indirectly necessitated large increases in U.S. borrowing and lending—chiefly subprime mortgages—to maintain full employment. This expansion of credit destabilized U.S. banks. When real estate prices fell 30 percent, it sparked a panicked run on an inherently unstable banking system.

Rather than diagnosing the problems properly, demagogues on the left and right claimed that ill-advised monetary policy, misguided regulation, and debt-fueled growth—fraudulently devised by reckless bankers—had created unsustainable prosperity. The public bought those views despite two decades of historic U.S. productivity growth that could only have been achieved with hard-earned investment, risk-taking, and innovation.

In *Unintended Consequences*, I explained why the U.S. economy was gradually growing more productive than Europe and Japan—namely, because higher payoffs for successful risk-taking were gradually building
U.S. institutional capabilities. More valuable on-the-job training, large
synergistic communities of experts, highly motivated and trained talent,
and equity in the hands of eager risk-takers had compounding effects on
the value of successful risk-taking. I recommended lower marginal tax
rates to maintain higher payoffs in the face of slower growth in the after-
math of the financial crisis. The Obama administration did the opposite.

I cautioned that holding the banks responsible for bank runs, in-
stead of just loan losses, at a time when they were already reluctant to
lend, would slow growth. I recommended strengthening government
guarantees of banks and the Fed’s ability to function as the lender of
last resort but charging banks and borrowers for these guarantees.
The Obama administration did the opposite.

Most Keynesian economists insisted that the government need only
borrow and spend idle savings to create growing demand. They also
claimed a credible threat of inflation would accelerate growth by dis-
couraging unused saving that slow growth. I predicted that constraints
to growth would prevent these policies from having positive long-term
effects and that the private sector would dial back risk-taking in re-
sponse to these policies, slowing growth further. I argued that America
should not distort the economy by inflating the money supply to dis-
courage savings nor increase unproductive government borrowing and
spending in an effort to put unused risk-averse offshore savings to work.
Instead, I recommended that the country should deal with the problem
of idle savings directly—by demanding balanced trade with trade part-
ners like China, Germany, and Japan. While trade is critical for growth,
trade deficits are not. The Obama administration did the opposite.

To foster growth, the U.S. government borrowed and spent $6 tril-
lion and inflated the money supply four-fold in order to buy another $3
trillion of privately held financial securities. Perhaps the recession
would have been worse without these efforts, but eight years after the
financial crisis, growth remains anemic and productivity growth has
fallen to historic lows. Financial crises likely slow recoveries, but eventu-
ally the economy rebounds. No rebound ever materialized, nor is one
in sight. Instead, slow productivity growth portends continued difficul-
ties. While it’s true that institutional capabilities allowed the U.S. econ-
omy to recover faster than other high-wage economies, they were already
producing faster growth in the two decades prior to the recession.
Because my business partner, Mitt Romney, was running for president when *Unintended Consequences* was published, the media held up my book as a defense of the 1 percent. At the time, a leading proponent of income redistribution wrote, “the biggest surprise, on opening *Unintended Consequences*, lies in discovering that this book isn’t about income inequality at all.” The critics’ demand for a comprehensive defense of income inequality planted the seeds for this book.

Since 2012, accusations that crony capitalism and the success of the 1 percent slow middle- and working-class income growth have only grown louder. While the incomes of the 0.1 percent have soared, the growth of middle-class and working-class incomes has continued to remain slow. Many insist that this gap has grown because the wealthy are rigging a zero-sum game to take what rightly belongs to others. *The Upside of Inequality* addresses these accusations head-on and explains why income redistribution hurts the middle and working class.

Advocates of income redistribution cavalierly insist that we can redistribute the income of successful entrepreneurs, financiers, and leaders without slowing growth. Austan Goolsbee, President Obama’s former chairman of the council of economic advisors, for example, insists that the growth in the 1990s provides evidence that taxes and payoffs for risk-taking have little, if any, effect on risk-taking and growth, since the boom came after President Clinton raised marginal taxes, which cut payoffs for success. Though increased tax rates would ordinarily dampen investment, during the ’90s, the rising payoffs for success, even after taxes, were great enough to spur increased high-tech entrepreneurialism and investment. This is hardly evidence that payoffs for risk-taking don’t matter. Quite the contrary, it shows that incentives matter even if they are affected by more than just taxes.

Played out over time, the differences in growth and middle-class prosperity between countries that have decreased incentives (through increased income redistribution) and those that have not are startling. Look at the differences between Europe and the U.S.; East and West Germany; and Communist China versus Hong Kong, Taiwan, and China today. There are enormous and compounding costs to dulling incentives for entrepreneurial risk-taking with few, if any, exceptions. As payoffs for success have risen, entrepreneurial risk-taking has accelerated U.S. growth relative to other high-wage economies with...
more equally distributed incomes. Because of this growth, today, median U.S. household incomes are 15 to 30 percent higher than Germany, France, and Japan.³

If redistribution isn’t the solution to slow income growth, what is? Some claim low-skilled immigration and trade with low-wage economies slow middle- and working-class wage growth. Many economists, however, insist that these are not the culprits. They claim that the low-cost imports make everyone better off, that opportunists will employ displaced and immigrant workers, and that competition will force employers to invest in order to increase productivity, which is essential for maintaining high wages.

If there were no constraints on growth, these economists might be right. But if resources essential to increased productivity, like capital, constrain growth, then trade and immigration may reduce wages by diluting these resources over a greater number of workers. With interest rates near zero, capital is clearly not constrained. Instead, properly trained talent and the economy’s capacity and willingness to bear risk constrain growth in today’s innovation-driven economy.

Today displaced workers wait for entrepreneurs, companies, investors, and other properly trained risk-takers to create jobs that employ them at high wages. But these resources are in short supply. And when high-wage jobs do appear, displaced workers find they are competing with the 40 million foreign-born adults and their 20 million native-born adult children who are also looking for work.⁴ Because of these constraints, both trade with low-wage economies and low-skilled immigration slow middle- and working-class wage growth. Unfortunately, few economists take these noncapital constraints into consideration.

Instead, Keynesian economists continue to insist that investment waits for demand and that government spending and the threat of inflation will accelerate growth. But thirty years in business have taught me that, contrary to what Keynesians say, investment rarely waits for demand. Investors wait for good ideas, like the iPhone, that create their own demand and for properly trained talent needed to commercialize ideas successfully.

Business runs hard just to stay in place. Companies are continually innovating, investing, and taking risks to avoid loses caused by improvements made by competitors. Competition drives most of the
value created by business into the pockets of customers, not investors. And payoffs for success drive the ferocity of competition. Competition between innovators creates middle-class prosperity, not well-intended but misguided government policies.

Business has also taught me that competitors succeed because they provide customers with more value than alternatives. The powerful reasons for their success make improvements hard to find. Most ideas for improvement look good in theory because the theory is wrong. In the real world, it takes a lot of failure to find a glimmer of true insight. Advocates of change rarely take the unlikelihood of finding real improvements into consideration.

This book lays out an explanation of the economy that recognizes the complexity and robustness of the economy, the power of incentives, and the rights of all mankind to enjoy the value produced by the talents of its lucky recipients. Along the way, it punctures today’s most popular myths about income inequality and the economy. Ultimately, it lays out a plan for growth that takes today’s constraints to growth into consideration.

If you take nothing else away from this book, I want you to remember this: Higher payoffs for success increase the supply of properly trained talent, and these higher payoffs motivate innovators, entrepreneurs, and investors to take risks. These two effects loosen the current constraints on growth, which frees the economy to grow faster. Faster growth increases middle- and working-class wages when the supply of lesser-skilled labor is constrained. Otherwise, it increases employment rather than wages. With smaller payoffs, growth would be even slower than it is.

Naturally, higher payoffs increase income inequality by increasing the wealth of successful innovators, entrepreneurs, and one-in-a-thousand CEOs who are essential to the competitiveness of our most important institutions. But when success bubbles up from a large sea of failure, should we begrudge them their payoffs when their success improves life for all of us? Of course not. We should celebrate our good fortune. It’s time to stop blaming the success of the 1 percent and embrace the upside of inequality: faster growth and greater prosperity for everyone.
Part I

The World
As We Find It
Chapter 1

THE CAUSES OF GROWING INEQUALITY

It seems as though you can’t pick up a newspaper today without reading an article blaming the 1 percent for the stagnant wages of the middle class. If people aren’t accusing the 1 percent of using crony capitalism to steal what they haven’t earned, then they are accusing them of inventing technology that hollows out the middle class or stifles the advancement of the underprivileged by underfunding education.

In 2003 renowned economists Thomas Piketty and Emanuel Saez burst into the public’s consciousness with convincing evidence that income inequality had increased dramatically, especially in the United States, and that middle- and working-class incomes had stagnated. Their work showed that income inequality had increased not so much because of an increase in the earnings of the top 10 percent of Americans or the top 5 percent or even the top 1 percent, but chiefly among the top 1 hundredth (0.01) of 1 percent.

Demagogues and politicians favoring income redistribution were quick to link the success of the 0.1 percent to the alleged stagnant wages of the middle class. They insisted that the rich were succeeding at the expense of the rest of America. They seized on this linkage to demand higher taxes on the rich for greater income redistribution.

In his 2013 book, Capital in the Twenty-First Century, for example, Piketty insisted the rich “by and large have the power to set their own
remuneration, in some cases without limit and in many cases without any clear relation to their individual productivity,” using nepotism, corruption, and corporate politics, or by conspiring with “hierarchical superiors.” According to Piketty, the 1 percent were merely the beneficiaries of gradually eroding social norms that previously held their pay in check. Success, he claimed, was earned at the expense of the middle class. The growth of CEO pay from thirty times the median wage in 1980 to over three hundred times by 2007 for the largest companies is held out as prima facie evidence.

The financial crisis of 2008 only fueled the flames of anger toward the wealthy. Banks were accused of predatory lending, the sale of fraudulent securities, and ultimately for recklessly causing the “Great Recession.” The 1 percent were held responsible.

The list of allegations and complaints against the most successful Americans continued unabated. The technology they create supposedly hollows out middle- and working-class jobs. They own and manage companies that lay off employees and hire offshore workers. They are accused of failing to provide appropriate funding for education and other benefits that may alleviate poverty and increase income mobility or allow for infrastructure investments that may spark faster economic growth.
At first glance, these accusations seem reasonable. The growth of middle-class and working-class incomes has slowed. Crony capitalism does exist. Automation and offshoring seem to have reduced the number of high-paying factory jobs. Companies like Apple, Google, and Facebook scarcely seem to employ any Americans, especially not middle- and working-class Americans. Academic test scores are not improving. And it seems impossible to break the generational cycle of poverty.

Yet despite these facts, the growth of the U.S. economy has accelerated relative to other high-wage economies with more equally distributed incomes—the opposite of what one would expect if crony capitalism or other unfair means of income distribution had increased in the United States on a scale necessary to account for rising income inequality. U.S. employment grew twice as fast as employment in Germany and France since 1980. This growth has created a home for 40 million foreign-born adults, their 20 million native-born adult children, and the 20 million children of these 60 million adults.

And America has achieved this employment growth at median household incomes that are 15 to 30 percent higher than other high-wage economies, such as Germany, France, and Japan.

Careful scrutiny of the evidence reveals U.S. median household incomes have grown as fast as, or faster than, other high-wage economies. Piketty and Saez’s use of tax returns instead of household income ignores the fact that an increasing number of workers live alone instead of in families with more than one worker and that an increasing portion of workers’ pay is now provided as untaxed health and retirement benefits, which are difficult to measure. Middle-class tax rates have also fallen as government services have grown.

At the same time, workforce participation has fallen as Americans have grown more prosperous. Social Security and Medicare, for example, now allow older workers to retire instead of working. It’s misleading to count them as household without earned income. And the demographics of the workforce have shifted toward lesser-skilled Hispanic immigrants who logically earn less than more highly skilled workers.

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*I have rounded numbers throughout this book. Time periods were taken from sources available at the time of writing (2015). The years 1979 or 1980 are often used as an initial period because of the comparability of the U.S. Census data.
Americans on average. When these factors are properly considered, real wages have grown more robustly than they appear to have. And there has been no hollowing out of the middle class whatsoever. Belief that wages have stagnated nevertheless persists.

The notion that the growing success of America's 0.1 percent is the cause of slower middle- and working-class wage growth is mistaken. Entirely independent forces drive the two phenomena.

As the economy grows, it values innovation more. As such, successful innovators who achieve economy-wide success, like Steve Jobs or Bill Gates, grow richer than innovators have in the past. It’s simple multiplication. And they grow richer relative to doctors, schoolteachers, bus drivers, and other median-income employees whose pay is limited by the number of people, or customers, they can serve.

At the same time, information technology has opened a window of new investment opportu

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ity but also faster employment growth at higher median incomes than other high-wage economies. Rising income inequality is the by-product of an economy that has deployed its talent and wealth more effectively than that of other economies—and not from the rich stealing from the middle and working classes.

In truth, the outsized success of America’s 1 percent has been the chief source of growth exerting upward pressure on domestic employment and wages. The success of America’s 1 percent is an asset, not a liability.

In the face of the evidence, it’s no surprise that even Paul Krugman, a leading liberal economist, admits, “I’m actually a skeptic on the inequality-is-bad-for-performance proposition. . . . The evidence . . . is weaker than I’d like.”

At the same time, a near-unlimited supply of low-skilled, low-wage workers—both offshore and immigrant—has put downward pressure on lesser-skilled wages relative to higher-skilled wages. The U.S. economy’s ongoing shift from capital-intensive manufacturing to knowledge-intensive services increased the demand for properly trained talent and reduced the need for capital. Normally, the increased availability of capital would make it easier to raise the productivity and wages of lower-skilled workers. But competition from an abundance of low-wage offshore workers combined with the productivity gains it demands from domestic producers with higher-wage workers leaves a smaller and smaller share of less-skilled workers employed in highly productive capital-intensive manufacturing jobs.

Today U.S. growth demands properly trained talent and a capacity and willingness to take the risks needed to produce innovation. A shortage of properly trained talent and of the economy’s capacity and willingness to take risk limit the entrepreneurial risk-taking, investment, and supervision needed to expand higher-wage, lower-skilled American employment opportunities. As a result, an influx of low-skilled immigrant workers has increased lower-wage work. In turn, the availability of low-wage immigrant workers puts downward pressure on low-skilled wages.

It’s true that trade with low-wage economies lowers the cost of goods more than the wages of domestic lower-skilled labor. Were that not the case, it would be cheaper to produce goods domestically, rather than import them. But middle- and working-class workers bear
100 percent of the burden of lower wages for only a portion of the benefits of lower-priced goods. The rich, retirees, and the non-working poor also enjoy the benefits of lower-priced goods but without suffering the cost of lower wages. So while international trade benefits everyone on average, because the costs are shared disproportionately, it slows middle- and working-class wage growth relative to the growth of everyone else’s income.

Growing income inequality is a real phenomenon, but a misdiagnosis of its causes and consequences leads to policies that slow growth and damage an already slow-growing economy. If the public mistakenly blames the success of the 1 percent for the stagnant wages of the middle class, while leaving the true sources of slow-growing wages—trade, trade deficits, and immigration—unaddressed, a dangerous feedback loop is likely to ensue. Raising taxes on success will reduce risk-taking and innovation. This will slow growth and reduce middle-class wages, and, in turn, increase the demand for redistribution.

Politicians who rely on middle- and working-class votes may relish this dynamic. Some may even advance the misunderstandings necessary for the problem to endure. Unfortunately, they either don’t realize or don’t care if they’re cooking the goose that lays the golden egg.

Lower marginal tax rates would increase the payoff for successful risk-taking needed to produce innovation. Higher payoffs would motivate increased risk-taking. And increased risk-taking would have gradually compounding effects on America’s ability to produce innovation—more people motivated to acquire and use the proper training, more valuable on-the-job training, growing communities of experts, and equity in the pockets of knowledgeable investors. These capabilities would magnify the value and likelihood of success. In turn, this would motivate prudent risk-taking and accelerate growth just as it has in America relative to other high-wage economies.

But unless we cut government spending, which seems highly unlikely, lower taxes would blow a huge hole in the deficit in the interim. And lower marginal tax rates would increase income inequality.

A more practical solution increases the pool of properly trained talent. America is full of high-scoring talent unwilling to endure the training and take the risks necessary to grow the economy. Their reluctance sets the price for success.
America could take a number of steps to increase its pool of properly trained talent. It could reduce subsidies to students and colleges studying curricula that do little to increase employment—psychology, history, and English, for example. There is an enormous mismatch between what high-scoring students study and what employers value. As the rest of the world trains its talent and grows increasingly competitive, America can no longer afford to waste a large share of its talent.

America needs to replace the current ethos, which discourages students from learning practical skills, with one that insists that talented people have a moral obligation to put their talents to full use serving their fellow man—whether serving them as customers or philanthropically. America could also nurture high-scoring students from low-socioeconomic families, as large numbers of these students are failing to graduate from college.

But training the next generation of students more effectively will have little effect on growth for decades, and then only with a slow compounding effect that won’t fully saturate the workforce for decades after that. And like all good intentions, it is unlikely to be implemented.

In the interim, America should recruit properly trained talent from the rest of the world through more logical immigration policies. It could also recruit employers with a lower marginal corporate tax rate, perhaps by offsetting lost tax revenues with a higher tax rate on capital gains or other taxes. These steps would not only have more immediate effects but may also reduce income inequality.

In the absence of substantial changes, retiring baby boomers threaten to eat our economy alive with their unquenchable demand for retirement benefits. And China looms as a growing existential threat to national security. Neither threat appears to be solvable on its own. Embracing ultra-high-skilled immigration is America’s best shot at avoiding permanent damage from these otherwise unsolvable problems.

Unless we fully understand the economics underlying growing income inequality—both the accelerating growth in the payoffs for success and the slowing growth of middle- and working-class pay—we will not understand the corresponding consequences of alternative policy changes. Without these understandings, we are likely to damage the economy rather than accelerate employment and wage growth.

So let’s begin by examining the economics underlying the growing
success of the 0.1 percent before turning to slowing middle-class wage growth. Then we can scrutinize alternative explanations for the facts as we find them in the second part of the book, before considering alternative proposals for change and making recommendations in the last part.

A Larger Economy Values Innovation More

While a number of economic factors drives the growing success of the 0.1 percent, this group grows richer for no other reason than the economy is growing larger. As the economy grows larger, the pool of customers grows larger. Today successful innovators, business leaders, and entertainers can serve more customers than they could have fifty years ago. As a result, the payback for economy-wide success is bigger than it used to be. An entertainer like Taylor Swift, for example, can reach a much larger market for her music than the Beatles could have in the 1960s.

Few people recognize the extent of the growth of the world economy. In 1964 the entire world economy was only as large as China’s economy is today! That growth has had a big impact on the success of the most successful workers.

Over the same period, the incomes of doctors, schoolteachers, plumbers, and other tradesmen remain limited by the number of customers they can serve. The size of the economy doesn’t change that. All other things being equal, economy-wide success, like Taylor Swift’s success, will grow larger relative to the income of typical workers. This increases income inequality.

The pay of entertainers and other successful entrepreneurs grows larger relative to the pay of the typical workers, not because these innovators charge customers more. If anything, they are charging customers less and less. They earn more because they have more customers.

Taylor Swift’s growing success doesn’t come at the expense of her fans. They aren’t paying more for her music; they are, paying less. And they wouldn’t buy her music if they didn’t believe it was worth more than it cost, so buying her music creates value both for Swift and for her customers. Music is more valuable today because it makes more people happy.

For the same reason, the size of the largest companies has grown
relative to the median pay of workers. The pay of CEOs has grown as companies have grown larger and more valuable. It’s illogical for a CEO managing five employees to earn the same pay as one managing fifty thousand employees. As companies grow larger and more valuable, CEO pay has logically risen relative to the pay of the average employee. The ratio of CEO-to-employee pay may be clever rhetoric, but it’s illogical economics.

It is no surprise, then, to find that as the world’s population has grown, income inequality has grown around the world. A more prosperous world values and rewards innovations—a new song or movie, a new technology, or a new insight—more highly than a less prosperous world. That’s a good thing. The growing income of the 1 percent is the result of simple multiplication, not a deduction from the pockets of the less successful.

Were it the case that the world was becoming a less competitive “winner take all” economy, as economist Robert Frank postulates, or an increasingly concentrated “superstar economy” with relatively fewer “box office” successes, as economist Sherwin Rosen contends, we would expect the success of the 1 percent to be growing even faster than the success of the most successful corporations. That hasn’t been the case. Instead we find that the growth in pay of the highest-paid workers, as large as it is, lags behind the growth of the S&P 500 index. From 1979 to 2007, the S&P 500 index grew 500 percent after tax while the incomes of the top 1 percent have grown only 275 percent. The economy has not grown less competitive, as Frank and Rosen claim. The world is simply growing larger, and that makes success more valuable.

Information Technology Disproportionally Benefits the Most Productive Workers

The rise of information technology has increased income inequality in other ways as well. Information technology—computers, software, smartphones, and the Internet—not only has increased the productivity of trained talent, making their labor worth more, but it also has opened a window of new investment opportunities. A surge in the
demand for properly trained workers has driven up their wages relative to lesser-skilled workers.

As technology augments the abilities of already productive workers, it increases the demand for workers who are trained in the use of technology. Assisted by computers, managers and entrepreneurs are now more effective than they have ever been before. They now have more accurate and comprehensive information to make decisions and more computing power to run “what if” planning scenarios. These tools increase their ability to serve customers more effectively and to find and commercialize new innovations that are beneficial to everyone. As a result, workers trained to use these tools have grown more productive.

Had computers merely increased the productivity of properly trained talent without also opening an even larger window of investment opportunities, higher productivity would have increased the supply of high-skilled workers relative to demand. High-skilled wages would have declined.

Fortunately, that did not happen. Information technology opened up more opportunities for employment than productivity gains expanded the capacity of high-skilled workers. Because demand for properly trained workers has exceeded supply, their wages have risen, albeit far more slowly than the payoff for successful innovation.

Information technology has given properly trained talent greater ability to add value. It has also opened a window of new investment opportunities. And at the same time, the world has grown more prosperous. A more prosperous world logically values innovation more. Given the circumstances, we should expect income inequality to rise.

**Information Technology Reduces the Need for Capital**

A shift from a manufacturing economy to an information economy has also increased income inequality. Success in the modern information-intensive economy often requires substantially less capital than the manufacturing-based economy. Information technology scales to economy-wide success without much need for capital. Successful innovators often have less need to share the value they have created with
investors. With less need to share their success with investors, successful innovators, such as like Bill Gates, Steve Jobs, and Sergey Brin, have grown richer than they would have had they needed to rely on investors. As a result, successful founders often look like large corporations of old. Their outsized success contributes to rising income inequality.

Successful IT start-ups no longer need large networks of buildings filled with expensive, long-lasting equipment and inventory to serve customers. Today’s start-ups can often find, communicate with, and distribute information-intensive products and services to customers globally with minimal additional costs. In fact, today’s successful start-ups often generate more cash than they consume.

With little need for capital investment, successful innovations like Google and Facebook can scale fully without much need for investors. Successful start-ups are often cash flow positive from the get-go. Today when entrepreneurs are successful, they often sell stock to the public only to establish its price so that founders can sell a small portion of their holdings.

Bigger payoffs from lottery-like success combined with less need for capital also motivates a greater number of talented individuals to take entrepreneurial risks. On average, if more people gamble, there will be more outsized winners even if the expected returns to gambling are poor. More lottery winners increase income inequality.

Compounding Success Benefits the Most Productive Workers

As the success of American innovators increases, that success itself has compounding effects that increase the pay and productivity of the highest-paid Americans. We see these effects when we compare America’s growth with that of other countries.

In America, cutting-edge companies like Microsoft, Google, and Facebook give their employees valuable on-the-job training that increases their productivity. Together these well-trained employees create communities of experts, such as in Silicon Valley. Access to communities of experts further enhances productivity of properly trained workers. This expertise permeates into the larger economy as
well-trained employees take jobs elsewhere, supervise others, and teach
them what they have learned—what economists call “spillover effects.”
Successful innovation also puts money into the hands of experts
with better understandings of related investment opportunities than
that of investors more broadly. Investment expertise reduces invest-
ment risk. Successful investments that find and commercialize more
innovation enhance productivity further.

A better-trained workforce, larger communities of experts, and
more knowledgeable investors increase the expected payoff for risk-
taking—both the value and likelihood of achieving success. Like any
game of chance, the higher the value and certainty for risk-taking, the
more people will take risk. More risk-taking accelerates innovation
and growth.

As well, the growing success of successful risk-takers raises the bar
for success by diminishing the success of others. In large part, success
is relative. Loss of status motives talented workers to get trained prop-
erly, work harder, and take more risks.

Together these effects combine into a self-reinforcing feedback
loop that gradually builds upon itself to create differentiated capa-
bilities that accelerate growth. These capabilities includes not only
better-trained experts and investors but also more motivated entrepre-
neurs and investors who are more willing to take the risks necessary to
produce innovation.

The failure of the rest of the world to spark the feedback loop that
builds these institutional capabilities limits the productivity of other
countries’ most productive workers and prevents them from contrib-
uting their fair share of innovation in a world driven by information
technology. A shortage of properly trained and productivity-enhanced
talent in the rest of the world leaves low-hanging fruit for American
innovators to pick. This further increases the value and pay of high-
skilled American workers.

The compounding effects of these dynamics show in the pay of the
highest-paid Americans relative to their counterparts elsewhere (see
Figure 1-2, “Effect of Productivity on Wages”). Americans earn more
because customers value their work more. Higher pay for properly
trained talent and more success producing innovation increase in-
come inequality.
The increased pay of the highest-paid workers is coming not at the expense of the rest of the workforce but from returns captured by investors. In both the United States and Germany, the bottom 99 percent of citizens earned 49 percent of GDP in 2007, despite America’s top 1 percent earning 14 percent of all income earned by labor, versus the German top 1 percent earning only 12 percent of labor’s income (see Figure 1-3, “99 Percent’s Share of GDP over Time”). Relative to Germany, the additional share of GDP earned by America’s 1 percent
comes entirely from the investors’ share of GDP, and not the share earned by the 99 percent. The same is true, albeit to slightly lesser degrees, in comparisons with France and Japan. Again, this split increases the pay of the highest-paid Americans without diminishing the pay of the other 99 percent.

A Greater Share of Resources Devoted to Innovation Increases Inequality

Given its unique advantages, unlike other high-wage economies in which capital costs as a share of GDP are growing faster than in the United States, America is investing brainpower in lieu of capital. As America devotes a greater share of its resources to producing innovation, it will produce a greater number of outsized successes. In turn, this increases inequality.

America’s antiquated manufacturing-based accounting system masks the extent of these investments. Today accounting largely expenses people-related investments as an intermediate cost of production, rather than recognizing them as capital goods that increase GDP, the way it recognizes investments in plant and equipment. Unrecognized investment leads to an understatement of investment, GDP, and productivity.*

Conservative measurements that take people-related investments into account, such as those employed in a 2006 study published by the Federal Reserve Board entitled “Intangible Capital and Economic Growth,” show significant increases in people-related investments. According to the study’s estimates, intangible investments rose from about 7 percent of non-farm-business output in the late 1970s to 10 percent in the early 1990s to about 14 percent today. Intangible investments rose dramatically in the 1990s when productivity accelerated (see Figure 1-4, “U.S. Investment in Intangibles as a Percentage of GDP”).

Given America’s heavy investment in knowledge-intensive intangible assets, it hardly seems coincidental that total factor productivity—productivity growth from innovation and know-how rather than from

* This mismeasurement grew so untenable that in 2013 the U.S. Bureau of Economic Analysis took its first steps to account properly for intangible investment.
greater capital investment or education per worker—surged from a growth rate of 0.5 percent per year from 1974 to 1995 to 1.75 percent a year from 1995 to the economic peak preceding the financial crisis.

America’s increased productivity growth relative to other high-wage economies stems from increased investment in intangibles—not magic. Nor should it come as a surprise that intangible investment rates in Germany and France, where productivity growth has been slower, were only 60 to 70 percent of those in the United States when measured as a percent of GDP in 2006. The less advanced economies of Italy and Spain invested at half that rate. Only the United Kingdom, which has grown as fast as the United States over the last two decades, albeit from a lower base of productivity and prosperity, has invested in intangibles at a rate comparable to that of the United States.17

It’s true that productivity growth has recently waned and that investment declined significantly in the aftermath of the financial crisis.18 But since the recession, Internet-related investment has come roaring back. One only need go to Silicon Valley to witness the phenomenon. The place is on fire. Google, Facebook, Amazon, and Apple have increased investment to $60 billion per year in 2014 from less than $10 billion in 2000.19 Together with venture capital’s $50 billion per year of funding, tech-related investment has eclipsed the 2000’s extraordinarily high $100 billion–per–year inflation-adjusted investment levels.20
Skeptics of America’s dynamism often point to the declining number of start-ups. But the reality is more complex than a superficial count of start-ups indicates. The consolidation of the retail and restaurant sectors by national chains like Walmart and Darden (the owner of Olive Garden) distorts the data of the U.S. economy, decreasing the number of mom-and-pop entrepreneurial start-ups. Mom-and-pop retail start-ups largely take market share from one another, rather than growing the economy. Taken as a whole, they do little to increase employment.

Start-ups that grow large increase employment, and those companies are predominantly high-tech start-ups. Successful high-tech start-ups require a subset of entrepreneurial risk-takers—ones that are both very smart and uniquely trained.

While it’s true that high-tech start-ups spiked briefly in 2000, there has been a gradual upward trend in the rate of high-quality start-ups since the early 1990s. In fact, 2014 represents the second-highest level of activity since the short-lived spike of 2000 (see Figure 1-5, “High Potential U.S. Start-Ups”). And in the San Francisco Bay Area—the hub of high-tech start-ups—high-quality start-up activity is substantially higher than it was at the peak in 2000. This hardly represents evidence that high-quality start-ups are waning—quite the opposite.

Others point to the recent slowdown in productivity as evidence of waning investment in innovation. But a slowdown in productivity growth can occur for a variety of reasons, independent of the amount of effort devoted to innovation. Add-on innovation in the wake of breakthroughs like the Internet, e-mail, personal computers, and smart phones initially accelerates productivity and then eventually slows as opportunities to pick low-hanging fruit are exhausted—“fished out” in economic parlance. Meanwhile, breakthroughs come intermittently and unexpectedly. Increased regulation can sap management’s attention and subsequently slow productivity growth. Dodd-Frank and the Affordable Care Act swamped the economy with regulation. A reduction in the rate of further gains from education and capital investment slows productivity growth independent of innovation. And investment and risk-taking clearly retreated in the aftermath of the financial crisis, as evidenced by a 40 percent to
50 percent reduction in accumulated business investment from 2007 to 2013 relative to historical norms.\textsuperscript{26}

Because productivity growth ebbs and flows independent of the resources expended, productivity growth relative to other high-wage economies is a truer measure of America’s ability to produce innovation. By all measures, effort (the amount of resources devoted to innovation) and outputs (productivity growth relative to other high-wage economies) of U.S. investment to produce innovation appear to be both substantially higher and more successful.

There are also reasons to believe productivity growth is higher than it appears to be. The Boskin Commission and decades of follow-up work by Northwestern University’s Robert Gordon, for example, also find understatement of productivity growth. This understatement largely stems from the U.S. Consumer Price Index’s failure to fully account for the value of replacing old goods with more valuable innovations—for example, by replacing landline-based telephones with smartphones. Properly accounting for these productivity gains boosts GDP growth upwards of 1 percent per year, which is substantial since GDP grows only 2 to 3 percent a year.\textsuperscript{27}
Goldman Sachs economists Jan Hatzius and Kris Dawsey reach the following conclusion about slowing versus unmeasured productivity growth:

Measured productivity growth has slowed sharply in recent years. . . . But is the weakness for real? We have our doubts. Profit margins have risen to record levels, inflation has mostly surprised on the downside, overall equity prices have surged, and technology stocks have performed even better than the broader market. None of this feels like a major IT-led productivity slowdown. One potential explanation that reconciles these observations is that structural changes in the U.S. economy may have resulted in a statistical understatement of real GDP growth. There are several possible areas of concern, but the rapid growth of software and digital content—where quality-adjusted prices and real output are much harder to measure than in most other sectors—seems particularly important.

Despite the recent slowdown in productivity growth, it’s not hard to imagine vast improvements in Internet-search capabilities, computing capabilities converging on consciousness, and genetic engineering that transform the human race in the long run. Historically we have seen nothing but surprisingly large improvements in our standards of living. So it’s hard to see us nearing a “fished out” pool of opportunities.

If the economy does reach a point of significantly diminishing returns to information-intensive innovation, and investment slows, income inequality will likely narrow considerably. But is that a good thing?

The short-term ebb and flow of productivity growth should not blind us to the long-term historic trend. The economy has devoted a greater share of resources to innovation. Today the U.S. economy invests by hiring smart people to improve the future—to invent applications for iPhones and to capitalize on the information collected by Google. It no longer builds plants and equipment. Because of this shift, income inequality has grown.

Consistent with this shift in investment from traditional investment
in capital goods, like plant and equipment, to innovation with widely
dispersed lottery-like returns, a 2015 study by the McKinsey Global
Institute shows that “since 2000, the average variance in returns on
capital for North American firms has been more than 60 percent
higher than the levels that prevailed from 1965 to 1980.” The study
finds that “this trend toward greater variability in corporate perfor-
mance is playing out at the sector level. . . . The margin gap between
the top quintile firms (by profit margin) and median firms in idea-
intensive industries has widened by 20 percent in the past decade,
more than in any other group of industries. In return on invested
capital, the gap between top performers and the median has grown by
25 percent.”

In contrast, to information-intensive investments, the study reports:

While idea-intensive firms run away with the profits, companies in
capital-intensive industries are feeling a growing squeeze. The aver-
age after-tax profit margin in industries producing capital goods is
roughly half the average of IT firms. . . . In addition, the margin
spread between capital-intensive firms at the fifth and 95th percentile
of profitability is much smaller than the spread in idea-intensive in-
dustries. . . . In these [capital-intensive] industries, it is much harder
for winning firms to pull away from the pack.

While competition between traditional companies is narrowing the
gap between winners and the rest of the pack, innovation in informa-
tion technology is widening the distribution of returns and subsequently
increasing income inequality.

Whether innovation becomes harder to find—and there is evi-
dence that it is becoming harder to produce—it doesn’t mean that the
payoffs for success or the amount of U.S. resources devoted to innova-
tive activities will correspondingly dwindle, at least not in the short
run. Growing global markets, relatively diminished competition
from the rest of the world, less required upfront investment, and less
opportunity in other endeavors can all offset a reduction in the prob-
ability of success from innovation. As the U.S. economy devotes more
resources to these lottery-like investments, income inequality will grow
at the highest end of the wage scale.
Increased Risk-Taking Increases Inequality
Even If the Returns Are Subpar

Even though a handful of fortunate innovators are making outsized returns, it does not mean that on average innovation’s profitability has increased and that entrepreneurial risk-takers, investors, and properly trained talent are merely benefiting from outsized risk-adjusted returns. Nor is it necessary for average returns to increase for inequality to rise. As more resources are devoted to finding and commercializing innovation, overall return on investment is likely to decline. Even if returns are declining in general, the shift toward innovation’s more widely distributed lottery-like returns—and away from traditional investments—can increase outsized success. Scrutinizing only the successful 1 percent (or 0.1 percent, or 0.01 percent) ignores the true cost of success, namely the cost of failure. Ignoring the cost of failure creates a distorted view of the value of success.

A more accurate measure of return on investment incorporates both the value of success and the cost of failure. This measure is the “expected value” of success—the value of success multiplied by the likelihood of success.

A ninetieth percentile earner used to be a doctor, lawyer, or corporate executive with a lifetime of near-certain employment. In the twenty-first century, a top graduate is likely to be working in a high-tech start-up with a remote prospect of success and facing a lifetime of disruptive career changes that will likely end badly late in his career—as an obsolete fifty-year-old without great prospects for high-wage employment. It’s true that one in one hundred may get very lucky, but given the uncertainties those one hundred face, are they really better off than their parents were?

It’s disingenuous to measure growth in the pay for the one lucky success while ignoring the fate of the other ninety-nine who didn’t succeed. A more accurate measure of pay includes not only the small number of successes but also the larger pool of workers from which they are drawn. It’s disingenuous to consider the 0.1 percent in isolation. Instead we also need to include the large pool of very talented failures—failures critical for finding that one lucky success. The group
of failures will likely earn less than their similarly skilled peers—the ones who became doctors and lawyers instead of failed Internet entrepreneurs.

There are numerous reasons to believe the overall returns to investment that produce innovation may be subpar. Proprietary ideas have been notoriously hard to guard. Economists have typically described ideas as non-excludible goods. Unlike physical goods, which only their owners can use, ideas are available for anyone to use but for know-how and legal restrictions, such as patents. Non-exclusivity makes it harder to use ideas to create sustainable competitive advantages critical to generating above-average returns. While it’s true that networks of users give companies like Google and Facebook competitive advantages from economies of scale, most ideas afford no such opportunity. Non-exclusivity makes competition more capable than it otherwise may be.

As well, we don’t see cash-rich technology companies like Google, Facebook, Apple, and Microsoft stretching to invest their cash in product development despite these companies possessing deep and far-ranging expertise and superior capability to commercialize viable innovation. Quite the opposite: we see these companies hoarding cash and buying back their shares. That’s odd behavior if the returns are superior.

It’s a misnomer to suggest high-tech companies are accumulating offshore cash simply to avoid taxes. They can and do use intermediaries—namely, banks—to borrow offshore cash and buy back their shares domestically to distribute cash to shareholders. They hold cash regardless.

In part, the investment opportunities may be so broad that tech companies with valuable franchises can’t afford to pursue every possible opportunity and threat to their business. Instead they may hoard cash to maximize their market value so they can outbid competitors to buy unexpected emerging technologies that threaten their existing business if necessary. The threat of technological disruption may be too high for companies with valuable franchises, like Google, to close off their options by using all their cash, whether for investment or distributions to shareholders. If companies are hoarding cash to protect themselves from emerging technologies, it indicates that the risk of loss from unexpected disruptive innovation is high.
It’s also possible that entrepreneurialism has grown so prevalent that companies like Google and Facebook—with limited upside to their market value—can no longer attract the most productive innovators. That would be consistent with the opening of a broad window of investment opportunities, albeit opportunities that disrupt existing businesses.

In those circumstances, large companies may not be able compete successfully by relying exclusively on internal resources for product development. Surely, a multifaceted approach is better than relying on a one-dimensional strategy.

It’s also possible that clever employees may be learning to scour their work environments more thoroughly for good ideas and abscend with them. Frankly, it may be unprofitable to produce innovation systematically without first randomly stumbling upon a good idea.

Entrepreneurial employees may be able to circumvent laws that protect corporate assets by passing good ideas to friends. If employees steal a significant number of good ideas, internal development will be less profitable.

The gradually accelerating turnover in the Fortune 500 is consistent with a growing risk of technological disruption. “In the 1920s and 1930s the turnover rate in the S&P 90 averaged about 1.5% per year. A new member of the S&P 90 at that time could expect to remain on the list, on average, for more than sixty-five years. . . . In 1998, the turnover rate in the S&P 500 was closer to 10%, implying an average lifetime on the list of ten years, not sixty-five!”

Surprisingly, “of the five hundred companies originally making up the S&P 500 in 1957, only seventy-four remained on the list through 1997. And of these seventy-four, only twelve outperformed the S&P 500 index itself over the 1957–1998 period.”

The changing fortunes in technology are even more tumultuous. The fifteen largest technology companies in 2000, at the peak of the Internet bubble, have lost 60 percent of their market value—$1.35 trillion as of December 2015. Nortel, a $200 billion company in 2000, is bankrupt today. On the same date, EMC’s market value was a quarter the size. Cisco’s was a third the size. Intel’s market value was 36 percent smaller as of December 2015. Only one, Microsoft, had a higher market capitalization.
While these apparent juggernauts were declining in value, fifteen companies with combined market capitalization less than $10 billion in 2000 are now worth over $2 trillion today. Apple’s market value, a has-been in 2000, has grown from $6 billion to over $650 billion today. With turnover like that, the values of established franchises are surely less than they would be otherwise, no matter the valuations financial markets currently place on them.

As hard as it may be for established companies to produce innovation profitably, it is surely even harder for independent start-ups and investors who lack the full breadth of expertise and capabilities necessary to commercialize viable innovations. Given the plethora of start-up-related risks, assets that reduce risk, such as teams of properly trained talent, proved supervision, an infrastructure for commercializing innovations, and synergies with existing businesses, are more valuable than they otherwise would be. Without them, stand-alone start-ups funded by independent investors are likely to be riskier and less profitable.

And unlike bets on exogenously driven growth—population growth, education-driven productivity growth, rural migration to more productive cities, two decades of pent-up demand first from the Great Depression and then the Second World War, and the growth of mass production and related capital investment—where every investor more or less has the same access to insights whether they truly have any insight or not, investing in technology increasingly requires technology-specific expertise and insight. Every fundraiser designs his or her start-up’s investment sales pitch to sound like a miraculous cure for cancer. Outside investors must acquire the necessary knowledge to avoid systematically investing in unworthy opportunities. Over and over again, one should expect investors to spend money evaluating new opportunities only to discover the investments are not worth making. Costly due diligence reduces investment returns and makes investing more expensive than it appears to be.

As such, Joe Stiglitz questions whether rich households invest directly in young start-ups that are critical to innovation and growth. He fails to see that rich households need not invest directly in start-ups to motivate high-tech entrepreneurialism.

Silicon Valley is full of entrepreneurs looking to create companies...
that will be highly valued by public market investors—chiefly wealthy households that either buy equity in successful start-ups directly through initial public offerings or through their ownership in other highly valued, public high-tech companies like Google and Facebook—if they are successful start-ups.

That’s not to say returns to innovation are poor. No one knows. But without the benefits of exogenous growth, given the near-certainty of widespread failure, and with competition from the growing amount of investments in intangibles like research and development, it would not be surprising to find below-average returns even though outsized success is rising. Income inequality may nevertheless rise as the dispersion of returns widens even though the increased risk necessary to produce a handful of outsized successes and the high failure rates needed to produce those returns may not represent the walk in the park they appear to be.

Loss of Status Drives Irrational Risk-Taking

As poor as the risk-adjusted returns on start-ups may be for investors who can diversify their risk by investing in many start-ups, they are surely much worse for individual entrepreneurs. Unlike investors who enjoy average returns by investing in many projects, founders and their teams risk everything on a single start-up. As such, they bear undiversified project-specific risks that investors avoid through diversification. Most will end up with little to show for their work. At the very least, they are putting the latter half of their careers and their retirement at risk.

In part, individuals may be joining start-ups because of a lack of good opportunities elsewhere. Waning investment opportunities from other exogenous sources of growth may have accelerated the shift to innovation-driven growth. In large part, necessity is the mother of invention. An increasing lack of both alternative investment and employment opportunities increases the willingness of talented workers to take entrepreneurial risks.

People also seem attracted to playing lotteries. In the lead-up to 2000 for example, when Internet payoffs exploded, young business students forsook high-paying, high-status careers to pursue far-fetched
Internet start-ups. In the lead-up to 2007, talented workers similarly flocked to risky hedge funds despite the near impossibility of beating average market returns in an effort to win big. The same thing is happening today in Silicon Valley—an explosion of unlikely-to-succeed start-ups fueled by talent seeking outsized payoffs.

Rising payoffs for state lotteries also lure an increasing number of people into taking irrational risks. Gambling increases, despite the fact that the expected payoff—the size of the payoff multiplied by the chances of success—remains poor. State lotteries collect far more money than they pay out. As a result, participants lose money on average.

Gamblers seem to systematically overestimate their capacities, underestimate the risks, and value a two-dollar payoff more than twice as much as a one-dollar payoff contrary to the economic theory of diminishing marginal utility. That theory posits a second car is less valuable to its owner than the first, the third is less valuable than the second, and so forth.

So it ought to follow that an additional dollar is similarly less valuable as one’s wealth grows. But money confers status, notoriety, and other things people desire beyond just the goods they consume. Or, at least, if people without money believe it confers these things, then the opportunity to own money may offset, at least partially, the increasingly declining value of wealth as payoffs grow larger.

Perhaps more important, status seekers lose status when others succeed. As a result, the most talented students no longer want to be doctors and lawyers. They go to business school and join start-ups despite the long odds of success. Loss of status drives them to take ill-advised risks in an effort to regain their lost status as potential lottery winners.

No surprise, microeconomic experiments that randomly distributed relatively large rewards to poor Kenyan villagers found that “the bigger the handouts to others in their village, the greater the dissatisfaction of the non-recipients.”

According to The Economist, a study published in the Journal of Public Economics in 2005 found that “we tend to look exclusively at those better off than us. . . . When the lot of others improves, we react negatively, but when our own lot improves, we shift our reference group to those who are still better off.”

Fortunately for the rest of us—the chief beneficiaries of entrepreneurial risk-taking that produces innovation—the outsized success of
a handful of entrepreneurs made talented workers feel a loss of status. Those workers ramped up high-tech entrepreneurial risk-taking despite the risks.

Conclusion

A frenzy of highly skilled entrepreneurial risk-taking is benefiting the U.S. economy. The U.S. economy continues to produce billion-dollar unicorns—venture-backed privately owned start-ups with billion-dollar valuations—at a substantially faster pace than Europe and with valuations that are substantially larger. From January 2014 to March 2016 alone, the number of U.S. unicorns has grown from thirty-two to eighty-eight, despite eighteen companies exiting the list after going public, with a combined value growing from $75 billion to over $300 billion. Over the same period, European unicorns have grown from two to sixteen (less two public offerings), with $9 billion of combined value increasing to $35 billion. During a time when large European start-ups created $26 billion of addition value, the United States created $225 billion of additional value—almost ten times as much!

While it’s true that American consumers will benefit from a cure for cancer even if it’s discovered by a Chinese company, American workers benefit more when the successful innovators are also American. At the very least, company’s founders, investors, and workforce disproportionately spend their gains in the United States, which pumps up the demand for goods and services made by lesser-skilled Americans.

Since 1980, the U.S. economy has increased employment nearly 50 percent—more than twice the growth of that of Germany and France, and more than three times the growth of Japan while providing median after-tax incomes for American families that are 15 to 30 percent higher than those of Europe and Japan. This is an unheard-of difference in performance.

And that difference in growth would have been greater still were it not for the disproportionate benefit of U.S. innovation, which accelerated the rest of the world’s growth.

* As of the time of this writing.
Successful American innovators also increase tax revenues as rich Americans pay a disproportionate share of taxes. Increased tax revenues provide more government services and benefits to lesser-skilled Americans. And a larger U.S. economy is also better able to defend itself militarily. It would be shortsighted to leave these opportunities to other economies to discover and commercialize when they are available to America even though they increase income inequality.

As other sources of growth have waned, information technology fortunately opened a large window of new investment opportunities. More so than the rest of the world, the U.S. economy capitalized on these opportunities.

IT increased the productivity of the most productive workers. With investment opportunities growing faster than productivity gains, the pay of the most productive workers grew.

A positive feedback loop ensued that further increased the productivity of the most productive worker. Better-trained workers and investors increased the likelihood and payoff for successful innovation. Like any game of chance, better odds increase the risk-taking needed to produce innovation.

A larger economy also increased the value of innovation. And unlike capital-intensive manufacturing, IT reduced the need for capital investment to scale to economy-wide success. These factors magnified the value of success and the pool of eager and talented risk-takers.

More risk-taking increases the number of fortunate successes even if the returns to risk-taking don’t improve significantly. Success diminishes the status of others. Loss of status drives many status seekers to regain their lost status by taking ill-advised risks. More risk-taking produces innovation that is beneficial to all of us.

Despite the success of America’s economy, demagogues have demonized the success of America’s 1 percent as a liability that hollows out the middle class, lowers wages, and damages the fabric of American society. But were it not for the successes of America’s most successful workers, U.S. employment growth would have slowed further, as employment growth did in Europe and Japan.

The outsized success of America’s 0.1 percent is the true source of its growing income inequality. Growing income inequality is a byproduct of the success of the U.S. economy. This success has been
shared broadly by the rest of the economy. If anything, America should try to entrench and expand its position as a hub of innovation by encouraging its best and brightest students to get the kind of training demanded by customers, and to take the risks necessary to produce more innovation.