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THE US ECONOMY: AN AGENDA FOR INCLUSIVE GROWTH

NOVEMBER 2016

BRIEFING PAPER

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THE US ECONOMY: AN AGENDA FOR INCLUSIVE GROWTH

NOVEMBER 2016

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IN BRIEF: A NEW US AGENDA FOR INCLUSIVE GROWTH

The US economy, for all of its innovation and resilience, has been weighed down by stubbornly weak growth and a productivity slowdown. Most households experienced real income declines in the past decade. Although the picture has brightened in recent months, long-term risks remain. This is a moment to consider how to accelerate and sustain growth while making it more inclusive. The United States needs to regain its dynamism—and the sense that everyone is advancing together. This can take many forms: re-engaging more workers in the labor force and improving their mobility, fostering new business formation and healthy competition, and helping declining cities reinvent themselves. While we do not make specific policy recommendations, this research shows how targeted action and investment in five areas could create substantial impact, potentially raising real GDP growth to 3.5 percent per year over the next decade.

- The United States is digitizing so rapidly that most users are scrambling to adapt. But while digitization has altered daily life for most Americans, it has been slower to penetrate large sectors of the economy. In fact, we estimate that the United States is realizing only 18 percent of its digital potential. Deepening digital usage and capabilities in lagging sectors and firms is an important piece of the productivity puzzle. Government can play a role by promoting digital investment, digitizing public services and procurement, and clarifying regulatory standards to encourage digital innovation.
- A relatively small share of US companies and cities dominate the nation's trade with the rest of the world and capture most of its inbound investment. Now globalization is rapidly changing, with a 45-fold increase in cross-border data flows over the past decade, in ways that play to US strengths. Firms of all sizes, and regions across the country, need encouragement to engage directly with global markets and investors to share in the benefits. But it is also time for a real inventory of the needs of communities that experienced trade shocks; workers caught up in industry transitions need greater and more sustained support.
- More than 80 percent of the US population lives in cities or surrounding metro areas, and their mobility and quality of life are increasingly at risk. Investment in urban transport infrastructure has not kept up with the needs of cities, creating congestion that raises costs and harms productivity. A shortage of affordable housing and commercial space has worsened the squeeze on households and businesses. Addressing these urban issues would improve worker mobility, create new investment opportunities, and benefit companies. The overall economy would stand to gain, since cities are the nation's engines of productivity.
- Less than 40 percent of college students complete bachelor's degrees within four years. But even as recent graduates struggle to pay off nearly \$1.3 trillion in student loans, workers could see an acceleration in technology-driven job churn in the next decade. The United States needs to build a more dynamic and responsive labor market to respond to these challenges, with more career paths outside the traditional degree track and more portable licensing requirements. Creating more apprenticeships and well-targeted training programs can put many on a more direct route to good jobs. New tech platforms and data-driven insights could help improve job matching and retool the entire US system of skills development.
- Competition among fuel sources and technology-driven efficiency improvements are combining to produce an unheralded energy revolution—one that could make resource firms more productive, reduce energy bills for consumers and for businesses in downstream industries, and make the entire economy more efficient. Policy can support this ongoing wave of innovation by continuing to take an “all of the above” approach to the nation's energy portfolio and ensuring that regulatory bodies are responsive and far-sighted about speeding the allocation of capital to the most promising opportunities.

Accelerating growth and productivity—not through cost cutting but through investment and higher output—is a matter of urgency. Spurring robust demand growth and taking steps to relieve the pressures on household budgets are also important pieces of the puzzle. Since private investment has not responded to low interest rates, the public sector may need to play a role in kick-starting this process and driving demand. This approach could set off a virtuous cycle of sustainable growth. With so many technology breakthroughs and new markets on the horizon, the United States should not settle for stagnation.

INTRODUCTION

Seven years after the Great Recession officially ended, the United States has settled into a pattern of modest economic growth. Hiring has resumed, driving unemployment back down to historical norms. Viewed against the prolonged weakness dogging many major economies, the United States stands out as one of the world's few bright spots of modest growth. Although recent indicators show real momentum, there is still a notable degree of slack in the economy.

While the United States may be outperforming other advanced economies, it is underperforming relative to its own potential—and although potential GDP has been revised downward, growth has not met even these lowered expectations.¹ Global headwinds and lingering structural issues, some of which pre-date the recession, have dogged the recovery. Recent data from the Conference Board contained the alarming news that US productivity growth turned negative for the first time in 30 years.

These trends have translated into real pain for most households. For decades, Americans had faith that the next generation would always be better off than their parents, but for many, that optimism has evaporated. Between 2005 and 2014, wages and other income stagnated or declined for more than 80 percent of US households.² The steady march of progress that once fed consumer confidence has been replaced by worries about how to afford housing, health care, a college education, and a decent retirement. Although tax relief, transfers, and other policy actions mitigated the effects of the downturn and protected disposable income for most households, many Americans are anxious about the future. The preferable and more sustainable way to create prosperity is to focus on restoring income growth.

Growth in economic output, productivity improvements, innovation, and dynamism have always paved the way to prosperity and will continue to do so. They may not be sufficient to overcome all of the structural challenges facing the United States, but they can create space for new solutions to take root. Conversely, slower growth in output and productivity eventually begins feeding on itself in a vicious cycle. It has forced the public and private sectors and even citizens into tough trade-offs and bitter disputes over how to protect their slice of a smaller pie. And it has worsened the divisions between those who embrace the opportunities associated with technology and globalization and those who would moderate these forces in pursuit of stability.

Sluggish growth has constrained our ability to think about the future in bold strokes. This phenomenon is not unique to the United States by any means, but the sense shared by many households that they are losing ground runs counter to the narrative of the American Dream that includes a thriving middle class and boundless economic mobility. The United States needs a new agenda for shaking off this stagnation—and the recent election results make it clear that there is hunger for change. While this paper does not make specific policy recommendations, we highlight promising ideas implemented by various levels of government, both domestically and around the world. The ideas are not meant to be exhaustive, but they are areas in which the McKinsey Global Institute has already focused extensive research. We have also conducted dozens of interviews with CEOs across multiple industries, and their input has informed our view of where progress could be achieved. Even in this era of polarized politics, there is room to take steps that will directly address the issues facing most households, bolstering consumer and business confidence in the process. By making capitalism more inclusive and investing for the future, the United States can restore the sense that everyone is advancing together.

¹ The Congressional Budget Office provides estimates of potential GDP and analyzes the gap between actual and potential GDP. See *The budget and economic outlook: 2016 to 2026*, January 2016, and *What accounts for the slow growth of the economy after the recession?* November 2012.

² *Poorer than their parents? Flat or falling incomes in advanced economies*, McKinsey Global Institute, July 2016. However, a more recent report from the US Census Bureau indicates that median household income rose 5.2 percent in real terms between 2014 and 2015.

AN ECONOMY MARKED BY DISPARITIES

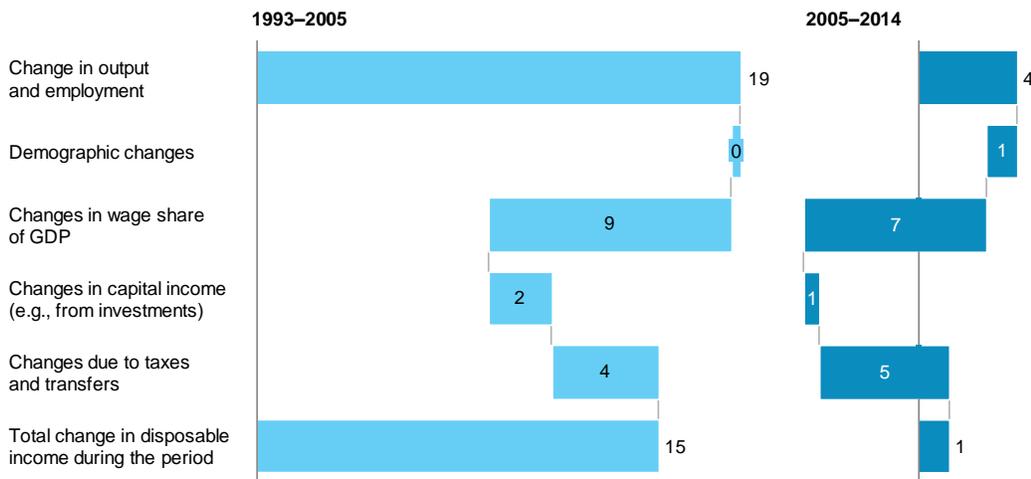
The United States has experienced 73 consecutive months of payroll employment growth as of November 2016. Some 15 million jobs have been created since early 2010, and unemployment has fallen to just 4.9 percent. But this sustained progress in hiring, combined with more recent signs that wages are beginning to tick up, has not been enough to alleviate the deep sense of economic insecurity felt by many American workers.

The US economy has bounced back from a historic downturn, but the Great Recession took its toll. Recent MGI research has found that for 60 percent of US households, combined wages and income were lower in 2014 than they were in 2005; they stagnated for another 20 percent of households over this time.³ After rising by 15 percentage points between 1993 and 2005, the disposable income of middle-income households has flattened over the past decade (Exhibit 1). However, trends have more recently begun to improve: in 2015, median household income grew by 5.2 percent over the previous year, marking the first annual increase in household income since 2007.⁴ In the meantime, the costs associated with maintaining a middle-class life have increased sharply in many parts of the country. Our analysis shows that for middle-income households, discretionary income (that is, income left over after taxes and spending on essentials such as housing, transportation, and food) fell from 9 percent of after-tax income in 2004 to negative 1 percent in 2014.

Exhibit 1

US household income growth has slowed in the past decade, mostly due to weaker output growth

Change in disposable income for middle-income US households
% change over highlighted period



SOURCE: McKinsey Global Institute analysis

Some of these challenges pre-date the recession. Roughly 20 million net new payroll jobs were created in the 1980s and again during the 1990s. In contrast, only seven million net jobs were created between 2000 and 2007—and approximately that many were subsequently wiped out in the recession, leaving the US labor market with a decade of essentially zero job growth (Exhibit 2). US workers used to be able to switch jobs easily, but mobility rates have been cut in half over the past quarter-century.

³ *Poorer than their parents? Flat or falling incomes in advanced economies*, McKinsey Global Institute, July 15, 2016.

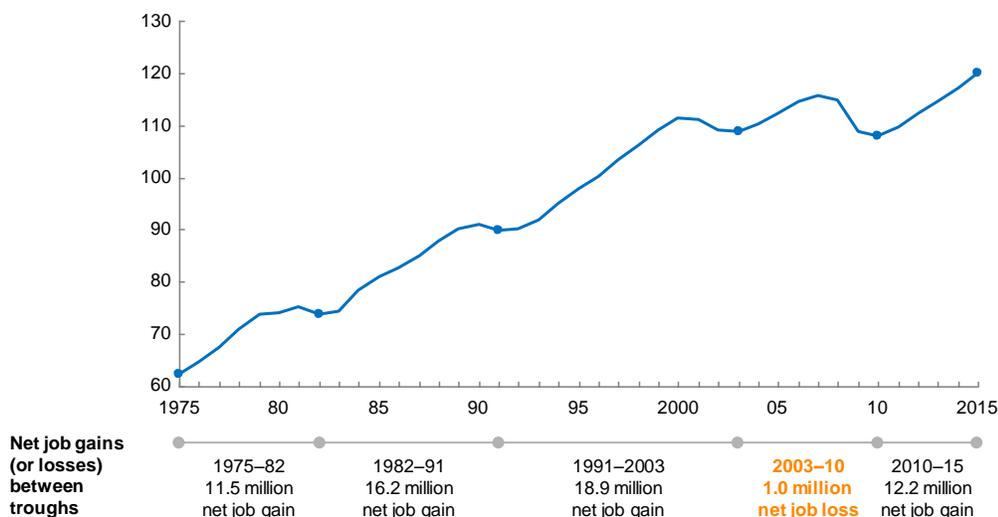
⁴ "Income, poverty and health insurance coverage in the United States: 2015," US Census Bureau, September 2016.

The drop in mobility coincides with a clear divergence in the economic prospects of US cities and regions, reversing a half-century of convergence in per capita income.⁵ Perhaps most worrisome for long-term growth, labor force participation has declined sharply since 2000. A lingering hangover from the recession is one culprit. But so are structural changes such as the aging of the workforce, labor's declining share of income, declining demand for low- and medium-skill workers, and changes in access to disability insurance and its value relative to wages.⁶

Exhibit 2

The current recovery follows a business cycle with no net job creation, which was unprecedented in US postwar history

Private non-farm employment in the United States (annual average since 1975)
Millions of employed workers



SOURCE: US Bureau of Economy Analysis; McKinsey Global Institute analysis

The income gap for households mirrors growing disparities in the business sector. Corporate profits have grown dramatically since the lows of the recession, peaking at 10 percent of GDP in 2012. They remain near their highest levels in history, but the distribution of profits is growing increasingly unequal across industries and firms. Asset-light, knowledge-intensive sectors such as pharmaceuticals, media, finance, information technology, and professional services have the highest profit margins. These industries' share of US corporate profits has doubled to more than 30 percent since 2000. Value is increasingly created from algorithms, patents, brands, trademarks, and copyrights rather than factories.⁷ Many US industries, including some of the most innovative, are now dominated by a handful of big names. A recent report from the US Council of Economic Advisers highlights several indicators of decreasing competition in the US economy, including a long-term decline in new

⁵ "Why the economic fates of America's cities diverged," *The Atlantic*, November 28, 2015; also see Peter Ganong and Daniel Shoag, "Why has regional income convergence in the U.S. declined?" NBER, January 2015.

⁶ David H. Autor, *The unsustainable rise of the disability rolls in the United States: Causes, consequences, and policy options*, NBER working paper number 17697, December 2011. Also see John Merline, "The sharp rise in disability claims: Are federal disability benefits becoming a general safety net?" Federal Reserve Bank of Richmond, *Econ Focus*, Issue 2Q/3Q, 2012. There are nearly nine million disabled workers on social security disability insurance (SSDI), representing 3.5 percent of the working-age population. This share is up from 2.4 percent in 2000 and 1.6 percent in 1990, and accelerated after the recession. Workers over the age of 65 contributed a relatively small fraction of the increase since 2000. At the SSDI participation rate of 2000, today's unemployment rate would be closer to 7 percent.

⁷ *Playing to win: The new global competition for corporate profits*, McKinsey Global Institute, September 2015.

business formation.⁸ These trends have implications for the labor market as well, since young, fast-growing firms account for one-fifth of all job creation, and nearly all of the net new job growth.⁹

Despite these challenges, the United States continues to be one of the world's most flexible, competitive, and resilient economies, as noted in a host of global index rankings. But there are concerns that its competitiveness may be eroding, and these issues speak to growing structural pressures that call for a new approach.¹⁰ The United States will need to fully harness its greatest strengths—its people, capital, resources, and know-how—and deploy them productively with the goal of creating more widely shared prosperity.

LAUNCHING A VIRTUOUS CYCLE OF GROWTH

Three levers are central to economic growth: income, demand, and production. In real terms, the median US household income is back at its level of two decades ago.¹¹ Meanwhile, the vast majority of income gains have gone to households in the top quintile that do not have the same propensity to spend. This in turn hobbles aggregate demand in the short term. Businesses do not see the need to invest in expanding capacity, which reinforces the longer-term trend of slow growth.

In recent years, most of the focus has been on how to address the income side, including proposals for minimum wage increases and calls for a more progressive tax policy. Given the polarization surrounding these issues, it has been exceedingly difficult to reach a consensus on taking a specific set of actions, particularly at the national level. Yet resigning ourselves to slower growth will mean an endless series of tough trade-offs: investments vs. entitlements, the needs of young citizens vs. those of seniors, the interests of business owners vs. those of workers. The United States needs to reinvigorate growth and set off a virtuous cycle that leads to a more participatory economy and broad-based prosperity.

To launch this positive growth cycle, we believe the conversation needs to expand beyond a focus on income alone. We also need to consider ways to increase demand by investing for the future and giving US consumers more spending power.

Since corporate investment tends to follow recoveries and not lead them, and since investment has not responded to the signals sent by low interest rates, the public sector may need to play a role in kick-starting this process and driving demand through targeted investment. Investment as a share of US GDP has declined steadily over the past three decades. Most notably, gross public investment declined from 6.5 percent of GDP in the 1960s to 4 percent in 2007. After a small increase after the crisis, public investment was cut to only 3.4 percent in 2014, despite historically low interest rates and concern about the nation's infrastructure and education systems. Net of depreciation, US public capital investment fell from 3 percent in the 1960s to 1.3 percent in 2007 and to 0.4 percent in 2014.

To a great degree, investment hinges on confidence. As companies see demand return, they begin to invest for the future and boost output, creating more and better goods and services. This paves the way for job creation and higher productivity growth—and the resulting economic value can be passed on to employees as wage increases or passed on to consumers in the form of savings, which similarly increases their purchasing power. Each part of the circle then becomes mutually reinforcing.

Spurring investment and demand will not only serve as a stimulus in the short term but will ensure that the economy's future potential does not erode over the longer term. Investment can also be targeted

⁸ *Benefits of competition and indicators of market power*, US Council of Economic Advisers issue brief, April 2016.

⁹ John C. Haltiwanger, Ron S. Jarmin, and Javier Miranda, *Who creates jobs? Small vs. large vs. young*, National Bureau of Economic Research working paper number 16300, August 2010.

¹⁰ Michael E. Porter, Jan W. Rivkin, and Mihir A. Desai, *Problems unsolved and a nation divided: The state of US competitiveness 2016*, Harvard Business School, September 2016. Also see *Growth and competitiveness in the United States: The role of its multinational companies*, McKinsey Global Institute, June 2010.

¹¹ FRED economic data from the Federal Reserve Bank of St. Louis, based on Census Bureau figures.

in ways that create jobs and relieve some of the pressures facing most US households, freeing up more of their income for consumption. Even as the United States continues to look outward for new opportunities in global markets, it is critical to look inward and take a real inventory of the need for revitalization in many communities that have experienced trade shocks. Investing for the future should eventually generate opportunities for all segments of the workforce. When the economy is firing on all cylinders, income gains tend to be more broad-based and less easily concentrated.

THE PRODUCTIVITY PUZZLE

Historically, productivity growth has complemented demand growth to deliver broad-based prosperity. The link between productivity and wage growth may have weakened in recent decades, but it still exists.¹² Robust productivity performance remains one of the fundamental components of a healthy economy. Higher output, after all, makes it easier for employers to raise wages. The slowdown in US productivity growth is part of the trend that has dampened prospects for income growth.

For 50 years, the United States was accustomed to strong GDP growth powered by two factors: an expanding labor force (itself a contributor to demand) and productivity improvements.¹³ But the future looks considerably murkier. An aging population is slowing growth in the size of the workforce, and after a 15-year decline, the labor force participation rate remains near its lowest point since the late 1970s.

The consistently brisk 2 to 3 percent annual productivity growth of the mid-1990s and early 2000s has stalled to less than 0.5 percent annually since 2010—a trend that appears to be worsening. Economists continue to debate its causes.¹⁴ Decelerating productivity growth is a problem shared by countries around the globe. But it is particularly vexing that the United States, with its open economy, flexible labor market, and highly innovative technology sector, cannot crack this puzzle.

Several factors are likely at work. Slow demand growth is reflected in weak output and investment, which can dampen productivity. Retirements drain the workforce of valuable skills and experience.¹⁵ Consumers have benefited from new digital platforms and tools in ways that are not captured in measured statistics. Historical methods for estimating the real prices of digital technologies may not adequately account for their expanding capabilities.¹⁶ This is a crucial point since information and communication technology and ICT-intensive industries contributed two-thirds to three-quarters of productivity growth between 1995 and 2005, and posted some of the steepest productivity declines in the past decade.¹⁷ Yet another factor may be the time it takes for firms to realize efficiency gains from technology investments, which some have estimated at over a decade.¹⁸ As laggard sectors, long

¹² The weakening of the link between productivity and wage growth may in fact be overstated. A forthcoming paper by Harvard economist Robert Lawrence, for example, argues that most of the often-discussed gap between growth in average real hourly wages and output per hour that grew between 1970 and 2014 can be explained by factors other than income inequality. These include measurement issues in output per worker, in worker earnings, and in the deflators used. The paper shows that average economy-wide wage growth for US workers has tended to reflect aggregate productivity growth, with the exception of a growing profit share since 2000.

¹³ *Global growth: Can productivity save the day in an aging world?* McKinsey Global Institute, January 2015.

¹⁴ See, for example, Robert J. Gordon, *Is US economic growth over? Faltering innovation confronts the six headwinds*, NBER working paper number 18315, August 2012; Eric Brynjolfsson and Andrew McAfee, *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*, W. W. Norton & Company, 2016; and Martin N. Baily, James Manyika, and Shalabh Gupta, "US productivity growth: An optimistic perspective," *International Productivity Monitor*, number 25, spring 2013.

¹⁵ Nicole Maestas, Kathleen J. Mullen, and David Powell, *The effect of population aging on economic growth, the labor force and productivity*, NBER working paper number 22452, July 2016.

¹⁶ Jan Hatzius and Kris Dawsey, "Doing the sums on productivity paradox v2.0," Goldman Sachs, US Economics Research, issue number 15/30, July 2015.

¹⁷ John Fernald and Bing Wang, "The recent rise and fall of productivity growth," Federal Reserve Bank of San Francisco, *FRBSF Economic Letter*, February 2015.

¹⁸ Erik Brynjolfsson and Lorin M. Hitt, "Computing productivity: Firm-level evidence," *Review of Economics and Statistics*, volume 84, number 4, November 2003.

supply chains, and a long tail of smaller firms begin to realize the benefits of their ongoing technology investments, the effects could be substantial enough to register as sector-wide and economy-wide productivity improvements.

The growing gap between the most productive, profitable firms and the rest of the economy is a logical place to focus, as recent evidence suggests.¹⁹ This is partly an issue of driving innovation in operations, technology, and business—but it is mainly about improving the fundamentals through higher operational efficiency, better resource allocation, and reduced waste. We estimate that more than three-quarters of the productivity growth required needed to reignite the economy can be achieved by closing the gap between lagging companies and those on the productivity frontier.²⁰ It will also be critical to examine regulatory structures and market distortions with an eye toward removing barriers that impede private investment and the transition to a more efficient economy.

Reversing the recent productivity slowdown is an urgent priority. While it may be a simple measurement of how much output is created relative to a given level of inputs, productivity is more than that; it is to some degree a marker of the nation's innovation, efficiency, and competitive edge in global markets. Productivity is the fuel that makes the economic engine hum and one of the keys to sustaining growth in living standards. It comes from continuously improving the performance, quality, or value of products—in short, from building a better mousetrap.

Productivity can increase in two ways: through cost-cutting efficiencies (that is, reducing inputs) and through increasing the quantity or quality of output through innovation and new products. Many US firms survived the Great Recession by cutting costs and asking fewer employees to do more in the face of slowing demand. This can provide a short-term boost to efficiency, but in the long run, weak demand inhibits public and private investment, eventually lowering the economy's potential. The kind of productivity growth that can sustain an economy over the long term stems from expanding markets and capturing new sources of revenue growth; investing in better equipment; and applying technological, operational, or business innovations. It is this kind of dynamic that the US economy needs to unleash.

Many workers hear the word “productivity” and immediately become suspicious that it signals a job-destroying exercise. But while rapid efficiency gains can sometimes eliminate jobs in the short term, this does not hold true in the medium to long term, as decades' worth of evidence shows (Exhibit 3). Productivity makes it possible for a country's economy to grow faster than its workforce, thereby generating wealth and increasing per capita GDP growth. Less waste and more efficient operations reduce costs and can, in aggregate, lead to higher employment as long as the savings are put back to work elsewhere in the economy. If companies pass on the savings to customers in the form of lower prices, for example, households and businesses are left with more money to spend elsewhere. Companies can also reinvest savings from more efficient operations into new activities. New purchases or investments are, in turn, a source of growth and jobs in the economy overall.

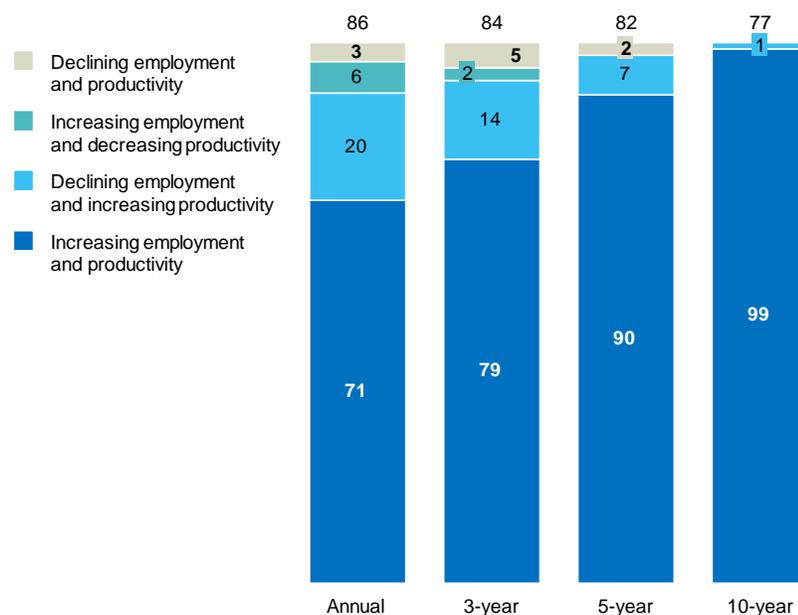
¹⁹ *The future of productivity*, OECD, 2015.

²⁰ *Global growth: Can productivity save the day in an aging world?* McKinsey Global Institute, January 2015.

Exhibit 3

The trade-off between aggregate employment and productivity levels is a short-term phenomenon

Rolling periods of employment and productivity change, 1929–2015
%, periods



SOURCE: US Bureau of Economic Analysis; McKinsey Global Institute analysis

FIVE PILLARS FOR PROGRESS

This paper identifies five specific growth opportunities for the US economy. Within each one, we consider how government could play a role in generating momentum. While we do not make specific policy recommendations, we highlight issues that need attention as well as promising ideas implemented by other governments, whether local or national, US or foreign. The five opportunities are not meant to be exhaustive by any means, but they are areas in which the McKinsey Global Institute has already focused extensive research and where we see room for substantial economic impact within a decade. In addition, we have conducted dozens of interviews with CEOs across multiple industries, and their input has informed our view of where progress could be achieved.

The first two are related to technology and trade, both of which have caused a great deal of economic anxiety and job churn. Rather than trying to fend off these forces, the United States has to embrace them as necessary ingredients of growth in the new global economy and retool its policies and labor market accordingly. But while some firms and workers have done very well by adapting to these shifts and pushing them forward, it is important to acknowledge that the gains have not been widely shared. Getting more Americans to participate in the opportunities associated with digitization and foreign trade and investment will allow them to share the productivity and growth benefits that can result—and stepping up efforts to support the workers who are caught up in industry transitions will ease the economic and societal stresses.

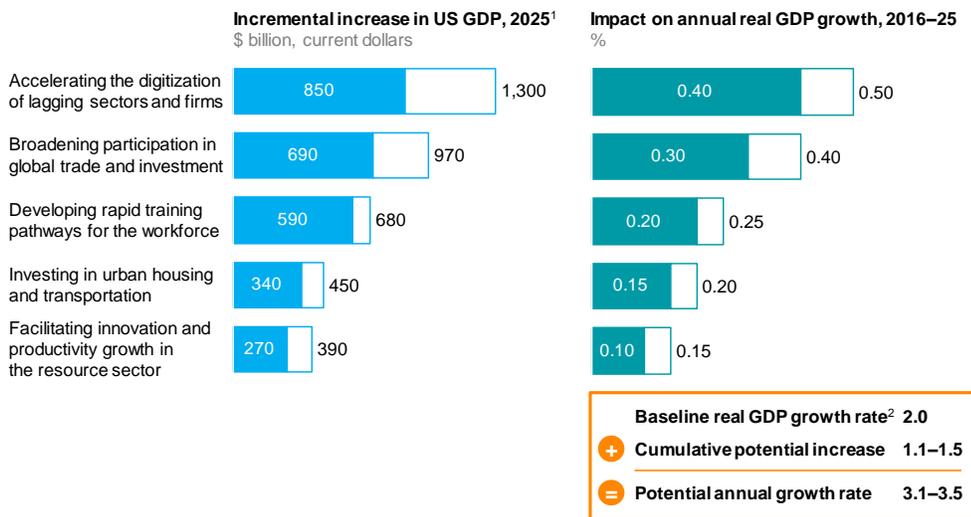
The other three opportunities are about investing for the future. Eighty percent of the US population lives in cities or the surrounding metro areas. Transportation infrastructure and affordable housing are issues that make a huge difference to their quality of life, their productivity, and their disposable income. At a time when the demand for skills is changing rapidly, creating churn in the job market, we also highlight the need to invest in the nation's workers, who need more effective education and training systems and clearer pathways to good jobs. Finally, we look at how to make the entire

economy more resource efficient, an endeavor that can reduce costs for households and businesses, and offer more opportunity for investment and innovation.

Taking targeted action in these five areas could accelerate growth across the economy. We estimate that these initiatives could produce real GDP growth of 3.1 to 3.5 percent per year over the next decade. By 2025, they could add \$2.8 trillion to \$3.8 trillion to annual GDP (Exhibit 4).²¹ This rate of growth would essentially re-create the productivity-driven boom of the 1990s.

Exhibit 4

Five opportunities could produce up to 3.5 percent annual growth over the next decade, adding up to \$3.8 trillion to US GDP by 2025



1 The estimated impact on GDP is based on partial-equilibrium analysis of mutually exclusive opportunities within each of the five initiatives. It does not consider the implications or second-order effects of changes in price levels, exchange rates, or trade and capital account balances. It is not meant to be a comprehensive estimate of the economic opportunity of each initiative.

2 Baseline estimate of nominal GDP and inflation from IMF, OECD, US Congressional Budget Office, Conference Board, and McKinsey Global Institute.

SOURCE: McKinsey Global Institute analysis

Bringing these initiatives to fruition requires investing in the future. Interest rates are at historic lows, and raising the currently anemic level of public investment in a targeted way could potentially pay for itself if these initiatives fire up the growth cycle. But that is not to say that the only answer is trillions of taxpayer dollars. Some of these policy actions are simply about creating opportunities, modernizing rules, convening, and matchmaking. In addition, there is a great deal of private capital on the sidelines, and investors are hungry for opportunities. Some businesses are already working with federal and local administrators in areas ranging from workforce training to urban redevelopment. Our interviews suggest that business leaders recognize the need to look past the current quarter's results and lay the groundwork to build long-term prosperity for their communities and the broader economy (see "The CEO view," below). They are searching for ways to partner with government—and their resources and ingenuity are waiting to be mobilized.

²¹ This estimate is based on a partial equilibrium analysis of some non-overlapping opportunities within each of the five initiatives. It is not meant to be a comprehensive estimate of the full economic opportunity of each initiative. We also do not consider the implications for, or second-order effect of, changes in price levels, exchange rates, or trade and capital account balances. Furthermore, this estimate includes only a subset of the full potential associated with each initiative. We estimate, for instance, that doubling the digital capabilities of lagging sectors and firms could create widespread efficiency gains amounting to \$1.3 trillion annually. But this considers only the impact of the Internet of Things and of data and analytics; other digital technologies on the horizon may create additional opportunities. The estimated increase in GDP growth is calculated from a baseline forecast of nominal GDP and inflation created from estimates put forth by the McKinsey Global Institute, the International Monetary Fund, the US Congressional Budget Office, the OECD, and the Conference Board.

The CEO view

This paper draws on a large body of previously published and ongoing research by the McKinsey Global Institute on the issues facing the US economy. In addition, we sought out perspectives from the business community on the issues that may be affecting confidence and their decisions to hire and invest. To that end, we conducted dozens of interviews with the CEOs of major US corporations in sectors including business services, medical devices and pharmaceuticals, health care, energy, insurance, and financial services.

We asked our CEO interviewees to share their perspectives about the most pressing issues for their own businesses and their concerns for the future direction of the economy as a whole. Their responses reinforced our view that focusing on the pillars outlined in this report could in fact remove some constraints and uncertainties while unlocking new opportunities for business growth.

Every CEO who sat down with us, for example, strongly emphasized the need to stay connected to global markets. Many of them see international customers as the key drivers of their future growth. The consensus is that the benefits of trade are clear, but ignoring the needs of those who lose out will fuel a continued isolationist backlash. “Protectionism is the greatest risk to this country,” one executive warned.

Many CEOs urged renewed investment in infrastructure to boost productivity and create a more competitive business climate. One referred to infrastructure as “the single pillar most in danger of eroding.” Several also expressed dismay about the short-term focus that is encouraged by financial markets and current incentive structures.

Many also pointed to the importance of a skilled workforce and argued for a combination of immigration reform and workforce development so that companies can hire the best talent. There is a widely shared sense among executives that the United States needs to rethink its model for education and training to sustain its competitive advantage into the future. One interviewee called on the private sector to take a greater leadership role in proposing specific workforce development policies that could fit into a broader national productivity push. Another noted that the United States already has a strong head start in digitization and workforce skills, and said the right investments could move the nation to a unique plane.

The executives we interviewed also noted that tax and regulatory frameworks should be modernized to create better incentives for hiring and investment. One CEO noted the difficulties of creating and growing a small business and called for “greasing the wheels to encourage entrepreneurship.” More than one felt that it would be better for individual companies and sectors to give up their specific exemptions for the greater good of holistic tax reform that simplifies complexity. Some were concerned about the impact of entitlement spending on the availability of funds for public investment.

Perhaps most striking, a number of CEOs pointed to low consumer confidence and the erosion of the average American’s belief in their own economic mobility and trust in business—an important factor since, as one put it, “our vibrancy depends on a confident workforce.” Several said they detect danger in the fact that many people no longer see how they fit into the economy and do not believe they have a chance to move up the ladder. These sentiments point to a willingness on the part of the private sector to play a role in meeting the nation’s long-term challenges.

1. ACCELERATING THE DIGITAL TRANSFORMATION OF THE US ECONOMY

Today's US economy no longer resembles the economy that went into recession nearly a decade ago, in large part because of the profound digital transformation that has taken place in the years since. Two-thirds of US adults now carry smartphones, three-quarters use social media platforms, and 98 percent of the population at least has access to high-speed wireless connectivity. Technology-driven change is unfolding in faster and faster cycles. The first online marketplaces were launched in the late 1990s; by 2014, US e-commerce sales topped \$300 billion. Six years after the first major mobile app stores opened, more than a million apps were available in the Google Play Store. Four years after the introduction of the iPad, 45 percent of US adults owned some kind of tablet.

But while digitization has altered daily life for most people, it has been slower to penetrate large parts of the economy. MGI's Industry Digitization Index represents the first major attempt to measure the progress of digitization within various sectors (Exhibit 5). It combines dozens of indicators to show where and how companies are building digital assets, expanding digital usage, and creating a more digital workforce. The results show that along with the technology sector itself, media, financial services, and professional services are surging ahead of the rest of the economy. By contrast, sectors such as government, health care, education, local services, hospitality, basic goods manufacturing, and construction are lagging. This group includes some of the biggest sectors in terms of GDP contribution and employment, creating a significant drag on overall productivity. As a result, we find that the US economy is operating at only 18 percent of its digital potential.²²

The uneven pace of digitization matters because firms and industries on the digital frontier are capturing disproportionate gains, creating a new digital divide between the digital "haves" and "have-mores." The most highly digitized industries have posted two to three times faster profit margin growth than others, as well as faster wage growth than the national average. Companies with advanced digital assets and capabilities generate faster revenue growth and higher return to shareholders. The "have-mores" are not just large companies that dominate one sector. They can be small, innovative firms or companies whose digital assets enable them to play in multiple sectors. Meanwhile, the opportunity cost for organizations and individuals that fall behind is growing.

These gaps are also important pieces of the productivity puzzle. Many observers have been confounded by the slow pace of US productivity growth during a period of near-continuous technology advances. This "Solow's paradox" phenomenon has led some to conclude that the revolutionary nature of digital technologies has been overhyped.²³ But digital capabilities *do* seem to be closely linked to productivity performance: The most digitized sectors contributed three-quarters of the productivity surge between the mid-1990s and mid-2000s, and they have remained nearly four times more productive than other sectors over the past decade. Meanwhile, large sectors of the economy are laggards on both digitization and productivity growth.

²² *Digital America: A tale of the haves and have-mores*, McKinsey Global Institute, December 2015.

²³ Robert J. Gordon, "US productivity growth: The slowdown has returned after a temporary revival," *International Productivity Monitor*, number 25, spring 2013; and Tyler Cowen, *The great stagnation: How America ate all the low-hanging fruit of modern history, got sick, and will eventually feel better*, Dutton, 2011.

Exhibit 5

The MGI Industry Digitization Index

2015 or latest available data

Relatively low digitization Relatively high digitization

● Digital leaders within relatively undigitized sectors

| Sector | Overall digitization ¹ | Assets | | Usage | | | | Labor | | | GDP share % | Employment share % | Productivity growth, 2005–15 ² |
|--------------------------------|-----------------------------------|------------------|---------------------|--------------|--------------|--------------------|---------------|-----------------------------|---------------------------|----------------------|-------------|--------------------|-------------------------------------------|
| | | Digital spending | Digital asset stock | Transactions | Interactions | Business processes | Market making | Digital spending on workers | Digital capital deepening | Digitization of work | | | |
| ICT ³ | | | | | | | | | | | 6 | 3 | 4.4 |
| Media | | | | | | | | | | | 2 | 1 | 4.5 |
| Professional services | | 1 | | | | | | | | | 8 | 6 | -0.4 |
| Finance and insurance | | | | | | | | | | | 7 | 4 | 0.8 |
| Wholesale trade | | | | | | | | | | | 6 | 4 | 0.6 |
| Advanced manufacturing | | | | | 4 | | | | | | 3 | 2 | 1.7 |
| Oil and gas | | 2 | | | | | | | | | 1 | 0.2 | 2.0 |
| Utilities | | | | | | | | | | | 2 | 0.4 | -0.1 |
| Chemicals and pharmaceuticals | | | | | | | | | | | 2 | 1 | 1.0 |
| Basic goods manufacturing | | | | | | | | | | | 6 | 5 | 1.0 |
| Mining | | | | | | | | | | | 1 | 0.3 | -0.6 |
| Real estate | ● | | | | | | | | | | 13 | 1 | 1.9 |
| Transportation and warehousing | ● | | | | | | | | | | 3 | 3 | -0.7 |
| Education | ● | | | | | | | | | | 1 | 2 | -0.6 |
| Retail trade | ● | | | | 3 | | | | | | 6 | 11 | -0.1 |
| Entertainment and recreation | | | | | | | | | | | 1 | 2 | 0.2 |
| Personal and local services | | | | | | | | | | | 5 | 10 | 0.1 |
| Government | ● | | | | | | | | | | 13 | 15 | 0.1 |
| Health care | | | | | | | | | | | 7 | 13 | -0.2 |
| Hospitality | ● | 6 | | | | | | | | | 3 | 9 | -1.3 |
| Construction | | | | | | | | | | | 4 | 5 | -1.5 |
| Agriculture and hunting | | | | | | | | | | | 1 | 1 | 0.6 |

- 1 Knowledge-intensive sectors that are highly digitized across most dimensions
- 2 Capital-intensive sectors with the potential to further digitize their physical assets
- 3 Service sectors with long tail of small firms having room to digitize customer transactions
- 4 B2B sectors with the potential to digitally engage and interact with their customers
- 5 Labor-intensive sectors with the potential to provide digital tools to their workforce
- 6 Quasi-public and/or highly localized sectors that lag across most dimensions

1 Based on a set of metrics to assess digitization of assets (8 metrics), usage (11 metrics), and labor (8 metrics);
 2 Compound annual growth rate.
 3 Information and communication technology

SOURCE: BEA; BLS; US Census; IDC; Gartner; McKinsey social technology survey; McKinsey Payments Map; LiveChat customer satisfaction report; Appbrain; US contact center decision-makers guide; eMarketer; Bluewolf; Computer Economics; industry expert interviews; McKinsey Global Institute analysis

Narrowing the gap between the laggards and those at the frontier of digitization is a critical place to focus as the United States seeks to accelerate growth. Virtually every US business now has digital tools of some kind, but most of them are using only a fraction of what these systems can do. Labor-intensive industries such as health care, for example, use sophisticated technology in some functions, but substantial parts of their large workforces barely touch computers or use rudimentary or poorly integrated systems. Many companies in local and fragmented industries (such as construction and hospitality) may not even accept digital payments. These sectors have millions of small and midsize

firms that tend to lag behind larger firms in digital adoption. This creates vast differences in the quality of goods and services that consumers receive across industries and firms.

There is some reason for optimism, however. Digital innovation has been focused on consumers in recent years, but now big data and the Internet of Things are beginning to change the way things are actually produced. Companies in manufacturing, energy, and other traditional industries have been investing heavily in digitizing their extensive physical assets, and this could soon begin to pay larger dividends. The Internet of Things, in particular, has a wide range of applications that we are only beginning to realize. It can optimize equipment and improve safety on factory floors and other worksites as well as controlling energy use and security in homes and commercial buildings. It can bring a new level of efficiency to traffic management, public transit, and other complex infrastructure systems, and it holds promise for improving the way patients are monitored in and out of hospital settings.²⁴

It can take several years for large firms (and whole sectors) to make the many organizational and operational changes necessary to capture the full benefits of ongoing digital investment.²⁵ As they do, the effects could become substantial enough to register as sector-level and finally economy-wide productivity gains.²⁶ Some of the largest sectors of the US economy—including quasi-public sectors such as government and health care, and labor-intensive sectors such as retail and construction—are among the digital laggards. More fully digitizing these sectors would have a large ripple effect and could contribute to improving the overall productivity growth of the economy.

Digital technologies sometimes unleash churn and disruption, but they have already created tremendous value in the US economy. A single digital platform like Skype has generated nearly \$200 billion in global consumer surplus in the decade of its existence. Over the past decade, several digital platforms (including Android, iOS, Google Search, Amazon, and Facebook) have exploited network effects and low marginal costs to grow global in scale, unlocking vast amounts of consumer surplus in the process.

MGI estimates that just two areas of digital innovation—big data analytics and the Internet of Things—could raise real GDP growth by half a percentage point above the baseline forecast over the next decade, adding \$1.3 trillion or more to annual US GDP by 2025. However, this would require the lagging sectors in the Industry Digitization Index to double their digital intensity.

ENABLING PROGRESS THROUGH POLICY

A nation's digital capabilities ultimately boil down to countless decisions by individual companies about technology systems, operational and workforce changes, and business models. But government can play a role by digitizing the delivery of public services, broadening the participation of small firms, and clarifying regulatory standards to promote innovation.

First, all levels of government can use digital technologies to become more transparent and responsive. There is an opportunity to reinvent the way federal agencies and state and local governments deliver public services and interact with citizens. There is also tremendous scope to apply more sophisticated analytics in functions from procurement to tax collection. MGI research has found that big data analytics in government services could produce productivity gains of up to \$95 billion annually and could save \$280 billion to \$460 billion through minimizing erroneous government payments, improving procurement, and making tax collection more effective.²⁷ These

²⁴ *The Internet of Things: Mapping the value beyond the hype*, McKinsey Global Institute, June 2015.

²⁵ Erik Brynjolfsson and Lorin M. Hitt, "Computing productivity: The firm-level evidence," *Review of Economics and Statistics*, volume 84, number 4, November 2003.

²⁶ Martin N. Baily and James Manyika, "Reassessing the Internet of Things," Project Syndicate, August 2015; also Michael Spence, "Automation, productivity, and growth," Project Syndicate, August 2015.

²⁷ *Game changers: Five opportunities for US growth and renewal*, McKinsey Global Institute, July 2013.

savings could be used to improve the US fiscal position or could be returned to citizens, freeing up more of their income.

But fully digitizing government services and integrating next-generation technologies into government agencies is easier said than done. Lack of compatibility between IT systems and fragmented data ownership that spans various departments pose major challenges. Additionally, IT skills are in high demand, and public-sector entities need to create career opportunities that can lure the necessary talent away from higher-paying private-sector jobs. Establishing government-wide coordination of IT investments can help to overcome some of these challenges.

Second, digitizing procurement and establishing government portals could encourage a multitude of small businesses to go digital themselves in order to win government contracts and take advantage of streamlined compliance procedures. Small firms often lack the capital and know-how to make and exploit digital investments, but productivity and innovation tax credits (such as those offered by Singapore) could provide the right incentives. Policy support can also help small firms get more exposure to next-generation technologies. Canada, for instance, funds “technology access centers” at colleges and universities so that small firms have access to applied research and innovation, specialized technical assistance, and even worker training.

Finally, a more comprehensive policy framework can give companies the certainty they need to invest in digital innovation. Data privacy and security, for example, are central to developing the Internet of Things. Governments can help to make choices about data collection, access, usage, and consent, especially for data generated in public spaces. The dangers that hackers could create in physical settings have to be carefully considered and guarded against; policy makers can help to address security issues by creating frameworks for liability.²⁸ Facilitating the development of common standards and establishing guidelines for open data are also important priorities for unleashing innovation. Governments can achieve this through regulation, but they can also use their convening and purchasing power to move the process forward.

Even more broadly, officials will have to take a new approach to keep up with the pace of change in the digital economy, which continues to take us into uncharted territory as new digital business models spread rapidly, sometimes within gray areas. This calls for a more experimental, adaptive, test-and-learn approach to policy and regulation. The fact that state and local governments are regulating in different ways can actually be a source of strength. This patchwork approach has created real-world pilot programs and trials that will allow for comparison and make some of the outcomes and unintended consequences more apparent over time.

The rapid pace of digital innovation also means that the demand for new types of technical skills is constantly shifting. This period of sweeping technological change will not be painless. Wage pressures are building in many traditional occupations, and some could lose relevance entirely. Policy makers will need to put new emphasis on building digital capabilities in the US workforce, and many mid-career adults will need to reinvent themselves quickly as job displacement accelerates. See Section 4 for further discussion of skills development.

²⁸ *The Internet of Things: Mapping the value beyond the hype*, McKinsey Global Institute, June 2015.

2. MAKING TRADE AND INVESTMENT WORK FOR ALL

Globalization has dramatically accelerated in the past three decades, not only in terms of trade in goods but also trade in services, cross-border investment, people flows, and flows of data. Between 1980 and 2007, cross-border trade and financial flows grew tenfold in nominal terms. These flows have flattened or fallen since the Great Recession, but cross-border digital flows have grown 45 times larger since 2005. They are projected to grow by another nine times in the next five years as digital flows of commerce, information, searches, video, communication, and intracompany traffic continue to surge. This development indicates that globalization is not in retreat, but rather in transformation.

This activity represents significant economic value. MGI's research indicates that over a decade, global flows of goods, investment, and data alone have increased global GDP by roughly 10 percent over what would have occurred in a world without any flows. This value was equivalent to \$7.8 trillion in 2014 alone, and data flows account for \$2.8 trillion of this impact. Furthermore, both inflows and outflows matter for economic growth and productivity, as they expose economies to ideas, research, technologies, talent, and best practices from around the world.²⁹

Rapidly growing digital platforms and cross-border data flows are providing new opportunities for individuals, small and midsize firms, and “born digital” startups to engage global consumers, suppliers, investors, and innovators (Exhibit 6). Yet participation in cross-border flows is still dominated by a relatively small number of large multinational firms. By one estimate, 80 percent of trade in goods and services takes place within the global value chains of large multinational firms.³⁰ US-based multinationals make up less than 1 percent of all US firms, but they account for nearly half of US exports. Large US firms (with more than 250 employees) account for nearly three-quarters of the nation's total exports. Of the nearly 30 million registered US companies, less than 1 percent sell abroad—a far lower share than that in any other advanced economy, according to the International Trade Administration. Today the vast majority of US small businesses do not export, and those that do tend to sell their products in only one country.³¹ This disparity in participation means that most US firms and their workers have seen few direct gains from the rapid growth of cross-border flows. There is significant room for US small and medium-sized businesses to increase sales to international markets.

Furthermore, even as globalization benefits the US economy in aggregate, it also produces winners and losers. Low-wage workers in industries that are exposed to import competition experience intensifying wage pressures, while those in export-heavy industries earn wages that are 18 percent higher on average than those in other manufacturing industries.³² A recent study found that job losses between 1990 and 2007 in industries that are heavily exposed to trade with China tend to be localized in hard-hit communities, and the effects have persisted for more than a decade.³³ The economic benefits to US consumers—in the form of lower prices, higher quality, and more variety—are significant, but they are diffuse. The costs of globalization, conversely, are disproportionately borne by a specific set of workers, their families, and communities.

²⁹ *Digital globalization: The new era of global flows*, McKinsey Global Institute, March 2016.

³⁰ *World investment report 2013: Global value chains: Investment and trade for development*, UN Conference on Trade and Development, 2013.

³¹ *The United States of trade: 50 stories in 50 states that show the impact of trade across the US*, US Department of Commerce and Office of the US Trade Representative, April 2015.

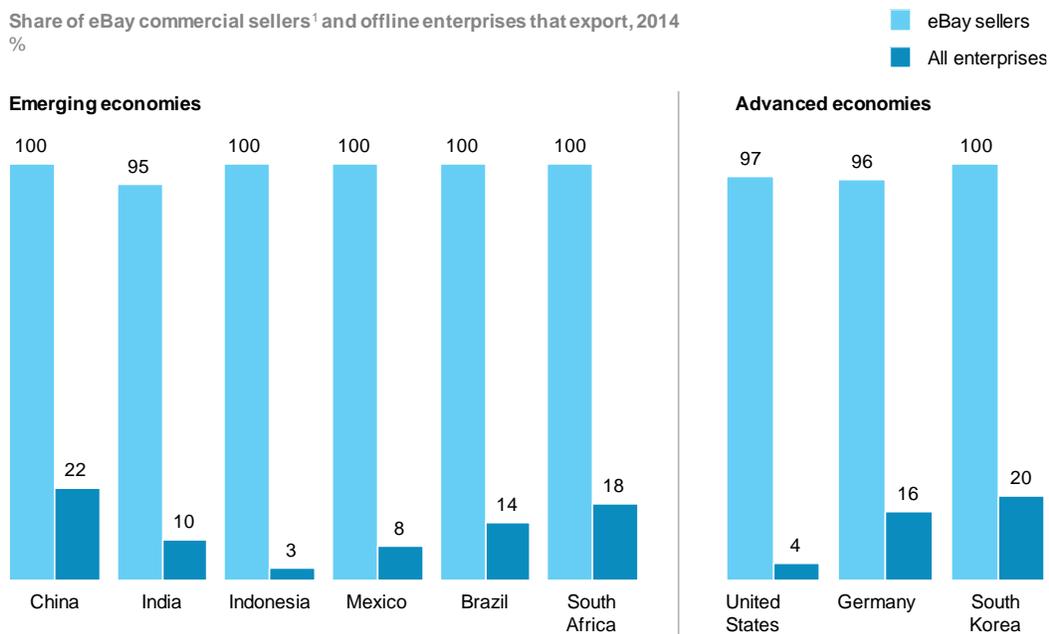
³² David H. Autor, David Dorn, Gordon H. Hanson, and Jae Song, “Trade adjustment: Worker-level evidence,” *The Quarterly Journal of Economics*, December 2014; and David Riker, *Do export industries still pay more? And why?* Office of Competition and Economic Analysis, US Department of Commerce International Trade Administration, Manufacturing and Services Economics Brief number 2, 2010.

³³ David H. Autor, David Dorn, and Gordon H. Hanson, *The China shock: Learning from labor market adjustment to large changes in trade*, NBER working paper number 21906, January 2016.

Exhibit 6

Digital platforms enable SMEs to attain global reach that comparable offline businesses have not achieved

Share of eBay commercial sellers¹ and offline enterprises that export, 2014
%



¹ eBay commercial sellers are defined as sellers with sales of over \$10,000 and at least 10 transactions in previous year.

SOURCE: eBay; World Bank Enterprise Surveys (using latest data available); McKinsey Global Institute analysis

These painful and persistent costs matter, as does the fact that the direct benefits of globalization have been realized by a relatively small set of corporations. The controversies swirling around globalization have become more heated in the United States and other advanced economies in recent years. The growing gap between winners and losers has produced a protectionist backlash that is exacerbated by misunderstandings about the dislocations caused by trade and about the evolving nature of globalization itself. Every CEO we interviewed mentioned growing isolationism and support for protectionism as one of the most serious risks facing the economy, given that staying connected to global markets is vital for growth and employment.

Some of the economic benefits of trade and investment go largely unrecognized. Over the past decade, the United States has been the world's largest recipient of foreign direct investment, with nearly \$2 trillion invested in a range of sectors, companies, and workers across the country. The economic benefits of global trade in goods are also well established.³⁴ One study estimates that international trade may have been responsible for about one-quarter of total US productivity growth over the 1990s and 2000s, and it also provides middle-class consumers with more than a quarter of their purchasing power.³⁵ One example is the typical midsize family car, which is the product of a highly global value chain and retails today at \$2,000 less than it did 30 years ago despite having \$3,000 worth of additional performance, safety, and infotainment features. This amounts to \$5,000 of consumer surplus for every midsize car purchased by households in the United States.³⁶ In contrast to asset-light sectors such as finance, information technology, and pharmaceuticals (all of which dominate US profit growth), manufacturing industries with long global supply chains tend to have

³⁴ See, among many others, Hendrik Van den Berg and Joshua J. Lewer, *International trade and economic growth*, Routledge, 2006; Francisco Alcalá and Antonio Ciccone, "Trade and productivity," *The Quarterly Journal of Economics*, volume 199, issue 2, 2004; Jeffrey A. Frankel and David Romer, "Does trade cause growth?" *The American Economic Review*, volume 89, number 3, June 1999; and James Feyrer, *Distance, trade, and income: The 1967 to 1975 closing of the Suez Canal as a natural experiment*, Dartmouth College and NBER, November 2009.

³⁵ *The economic benefits of US trade*, Executive Office of the President, May 2015.

³⁶ *Playing to win: The new global competition for corporate profits*, McKinsey Global Institute, September 2015.

relatively low profit margins. The profit margin gap between top-performing firms and median firms in these industries is also small. For these firms, optimizing supply chains is vital to staying competitive—and consumers are the biggest beneficiaries of the resulting pricing pressures.

Additionally, the impact of trade on job losses is frequently overstated. The US manufacturing sector, which accounts for two-thirds of US exports, lost nearly six million jobs, or one-third of the sector's total employment, between 2000 and 2010. But MGI research has found that trade and offshoring explain only about 20 percent of these losses, and those were concentrated in a small set of highly tradable industries. More than two-thirds of job losses were due to a collapse in demand growth for manufactured goods as two recessions took a toll on discretionary consumer spending. Most of the manufacturing sector's GDP is in industries that tend to locate relatively close to demand; in the United States, as demand slowed and firms looked for continued productivity growth, job losses ensued.³⁷ By the same token, more than 85 percent of the nearly one million manufacturing jobs created since 2010 can be attributed to the resurgence in demand for cars, machines, and consumer packaged goods.

The current debates over the pros and cons of trade seldom take into account that the very nature of cross-border flows is changing in ways that can benefit the United States and enable wider participation. Where flows of physical goods and finance were the hallmarks of the 20th-century global economy, 21st-century globalization is increasingly defined by flows of data and information. Virtually every type of cross-border transaction now has a digital component: approximately 12 percent of the world's trade in goods is now conducted via e-commerce, and half of all traded services are digital. Digitization changes everything: the nature of the goods changing hands, the universe of potential suppliers and customers, the method of delivery, and the capital and scale required to operate globally. The United States may have lost out in certain industries in which low labor costs outweighed higher productivity and innovation—but as the world's largest producer of digital content, platforms, and services, it operates from a position of strength in a world defined by digital globalization. Already, for instance, the United States runs a trade surplus in digital services with the European Union amounting to over 5.5 percent of annual US-EU services trade (Exhibit 7).

In this rapidly changing environment, the imperative for the United States is broader and deeper global engagement, not withdrawal. In the decade ahead, another one billion people in emerging markets will enter the “consuming class,” with enough income to become significant consumers of goods and services. McKinsey has estimated that emerging-market consumers will collectively create a \$30 trillion market opportunity for companies by 2030.³⁸

The concerns over job displacement are real, and they demand greater attention from policy makers. Our CEO interviews emphasized that there is growing recognition that more needs to be done for those who have been left behind. But responding to those concerns by shielding vulnerable industries from international competition weakens productivity, reduces growth, and slows innovation—and ultimately may harm the same communities, workers, and small and midsize firms that have yet to benefit from globalization.

Compared to other OECD countries, the United States has a relatively low ratio of trade to GDP as well as a relatively small share of companies that export or receive foreign investment. Lowering the barriers to globalization for small and mid-sized companies represents an opportunity to boost the overall productivity of individual sectors and the economy as a whole. A large body of research shows that globalized companies tend to be significantly more productive. This may be because of self-selection (that is, the most productive firms choose to become exporters) or because exposure to

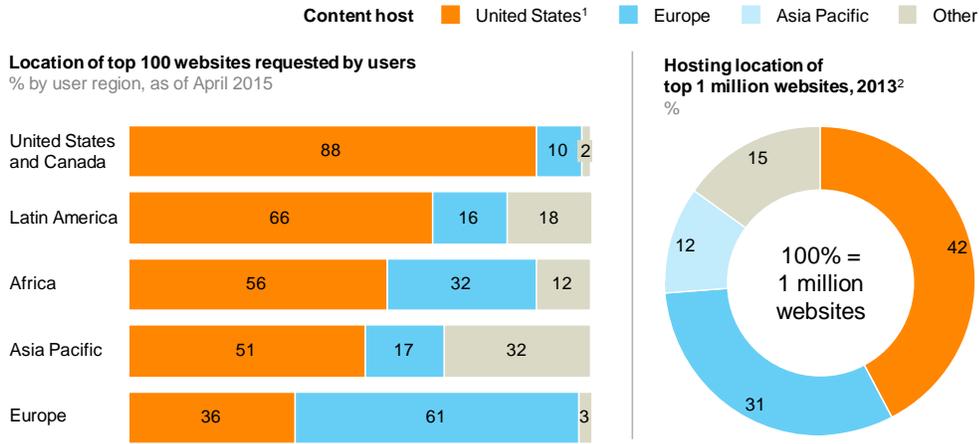
³⁷ *Manufacturing the future: The new era of global growth and innovation*, McKinsey Global Institute, November 2012.

³⁸ *Winning the \$30 trillion decathlon: Going for gold in emerging markets*, McKinsey & Company, August 2012.

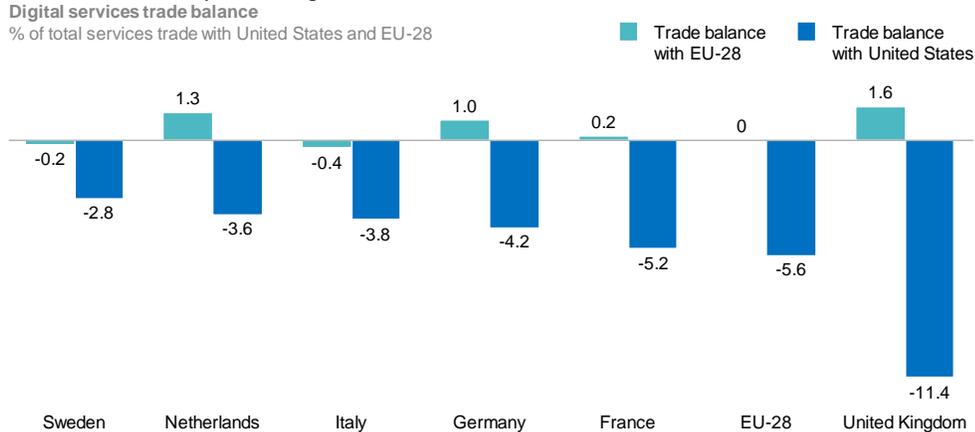
trade, investment, and foreign competition helps firms gain know-how and become more productive.³⁹ We estimate that getting more US firms to export could raise productivity levels in tradable manufacturing and services sectors by 3 to 4 percent, contributing \$700 billion to nearly \$1 trillion to GDP by 2025.⁴⁰

Exhibit 7

The United States is the largest producer of digital content for Internet users across the globe



EU countries are net importers of digital services from the United States



1 Includes United States and Canada for location of top 100 websites requested by users.
2 Based on Pingdom analysis of Alexa top 1 million websites.

SOURCE: TeleGeography, Global Internet Geography; Pingdom; Eurostat; OECD; International Trade Centre; European Commission Joint Research Centre; CSIMarket; McKinsey Global Institute analysis

³⁹ See for instance Andrew B. Bernard and J. Bradford Jensen, *Exporting and productivity*, NBER working paper number 7135, May 1999; Andrew B. Bernard, J. Bradford Jensen, and Peter K. Schott, "Trade costs, firms and productivity," *Journal of Monetary Economics*, July 2006; Chad Syverson, *What determines productivity?* NBER working paper number 15712, January 2010; and Jan De Loecker, "Detecting learning by exporting," *American Economic Journal: Microeconomics*, August 2013. Also see reports by public-sector agencies, such as *Small and medium-sized enterprises: Characteristics and performance*, United States International Trade Commission, November 2010. This topic is also addressed by a large body of literature that focuses on case studies of individual countries and sectors.

⁴⁰ This estimate is a partial-equilibrium estimate based on a large body of research, including by the McKinsey Global Institute, highlighting the difference in productivity levels and growth rates between firms that export or receive inward FDI and those that do not. The estimate does not make assumptions about the exchange rate or balance of payments, nor does it consider the implications of changes in these variables on prospects for trade and investment.

ENABLING PROGRESS THROUGH POLICY

Three areas in particular require policy action to ensure more broad-based participation and gains from this new world of digital globalization and to address some of the dislocations caused by foreign trade and competition that can no longer be ignored.

The first area for action is enabling more US companies of all sizes to participate by helping them find new export markets and investment partners. The newly signed Trade Facilitation and Trade Enforcement Act contains a key provision for microbusinesses, raising the customs and duties exemption from \$200 to \$800 for US goods sold overseas. But there is more to do, starting with building basic awareness and export capabilities among small businesses. Many of the biggest overseas opportunities are in mid-tier cities around the world that are unfamiliar to many US firms. Forty-one percent of firms surveyed by the National Small Business Association cited a lack of knowledge about international markets as their reason for not exporting. Small businesses need more mentorship and strategic guidance to understand the market opportunities at stake. Customs procedures and requirements, originally established for big corporations to export vast quantities of goods, also need to be retooled so the multitude of small businesses handling small purchases from individual customers overseas can thrive. The US customs system will need to balance speed and dexterity against the imperative to secure borders.

Another opportunity is in ensuring open access for cross-border digital platforms. E-commerce marketplaces such as Alibaba, Amazon, and eBay are providing millions of small and medium-size enterprises around the world with the exposure and logistical tools they need to become exporters. Digital platforms are also creating new global flows of communication, capital, and services. But these developments will reach their full potential only if the right multilateral agreements are in place. Many countries are bringing a protectionist mindset into cyberspace, which hinders the creation of a more seamless digital global marketplace. Regulations that inhibit the free flow of data or require companies to have a physical presence in order to do business in a given country can stifle digital entrepreneurs and discourage smaller firms from participating in globalization. Creating digital trade agreements could be more important to future US growth than hammering out treaties on tariffs.

But even as the United States looks for new market opportunities abroad, it will need to do more at home to support the workers and communities that have been hit hard by foreign competition in certain industries. Economists and policy makers alike are guilty of glossing over these so-called “distributional consequences”; the assumption that workers in shrinking industries would be redeployed elsewhere has not played out quickly or smoothly in the real world. The workers who have been caught up in these transitions need greater support. Although the Trade Adjustment Assistance program was designed to address these issues, it has had mixed success in providing displaced workers with retraining and re-employment at commensurate wages.⁴¹ Investment in this program represents only a tiny fraction of the economic value created by trade deals; this allocation merits fresh consideration. This could take the form of greater safety net measures, relocation assistance, or better-targeted retraining programs. (See Section 4 for further discussion of reshaping the US system for skills development and training.)

Finally, cities, counties, and states themselves can seize the initiative to attract more foreign direct investment. Many of the regions that missed out on FDI have lost manufacturing jobs but still have pools of highly experienced workers, long-lived small and midsize firms, advanced technical know-how, and industrial and research facilities. They are attractive destinations, particularly for emerging-market firms looking for assistance in technological development. While the United States received \$2 trillion of FDI in the past decade—more than any other country—less than 1 percent came from China and India cumulatively. Firms from these and other emerging markets are starting to invest overseas,

⁴¹ See the US Government Accountability Office reports on trade adjustment assistance in 2001 (number GAO-01-998) and 2006 (number GAO-06-43). Also see Kara M. Reynolds and John S. Palatucci, “Does trade adjustment assistance make a difference?” *Contemporary Economic Policy*, volume 30, issue 1, January 2016.

and while cities and regions themselves can do more to attract their investment, the federal government can play a bigger role in facilitating these matches. A program that helps route new foreign investors to small and midsize US firms, perhaps building on the International Trade Administration's SelectUSA initiative, could provide much-needed capital and exposure to global markets for companies and communities across the country. Connecting foreign investors with US communities in need of revitalization can help those cities script a second act.

3. REINVESTING IN AMERICA'S CITIES

In business and across the broader economy, growth requires investment. Yet when measured as a share of GDP, total investment in the US economy is at a 50-year low. Private investment plummeted during the Great Recession but has rebounded, if not fully recovered, since 2010 (Exhibit 8). The clear driver of the decline is sagging public investment—in education, R&D, and infrastructure, all of which are ingredients of future innovation, productivity, and growth.

Gross public investment stood at 6.4 percent of US GDP in 1965, then fell in the late 1960s as the era of major infrastructure projects such as the interstate highway system wound down. Substantial declines occurred in the late 1980s and early 1990s and yet again after 2010. Today gross public investment stands at only 3.4 percent of GDP. Since 2008, public investment as a share of GDP has fallen more sharply in the United States than in any other advanced economy.⁴² Some two-thirds of the decline over the past 50 years has come in state and local spending on structures—that is, roads and highways, transit systems, water and sewer systems, power grids, and public buildings. Part of this spending comes from federal pass-through funding, so the issue involves all levels of government.

Infrastructure investment, particularly in interstate highways, waterways, and links between regions, has historically contributed to productivity growth in the United States.⁴³ While these links can be improved, the most pressing imperative today is for greater urban mobility and connectivity. Underinvestment has dampened the productivity and growth potential of America's cities, which are its real economic engines. The 250 largest US cities account for 85 percent of the nation's output, and their GDP per capita is 35 percent higher than that of rural areas or smaller cities.⁴⁴ Urban issues are often left out of the national policy debate, yet they have a tangible impact on the majority of US households. More than 100 million Americans live in principal cities, with an additional 160 million in immediate suburbs, together accounting for more than 80 percent of the population.⁴⁵

While cities face numerous challenges, we focus here on two intertwined issues that have a major, direct effect on households, businesses, and urban productivity: transportation and real estate. There is an increasing need to think about transit corridors and residential and commercial real estate holistically so that urban economic activity is not gridlocked.

The deterioration of urban infrastructure is a major quality-of-life issue—as well as a pocketbook issue and even a public safety issue—for most US households and businesses. Traffic congestion alone costs the average urban car owner \$960 a year, a figure that rises to \$1,400 in metro areas over three million people (and \$1,800 in the nation's capital).⁴⁶ In many cities, transit systems are in dire need of maintenance and expansion. The daily grind of commuting in cities with poor transit options is toughest for low-income residents but felt by everyone.

⁴² *Bridging global infrastructure gaps*, McKinsey Global Institute, May 2016.

⁴³ M. Ishaq Nadiri and Theofanis P. Mamuneas, *Contribution of highway capital to industry and national productivity growth*, September 1996.

⁴⁴ *Urban America: US cities in the global economy*, McKinsey Global Institute, April 2012.

⁴⁵ US Census Bureau; *Urban America: US cities in the global economy*, McKinsey Global Institute, April 2012.

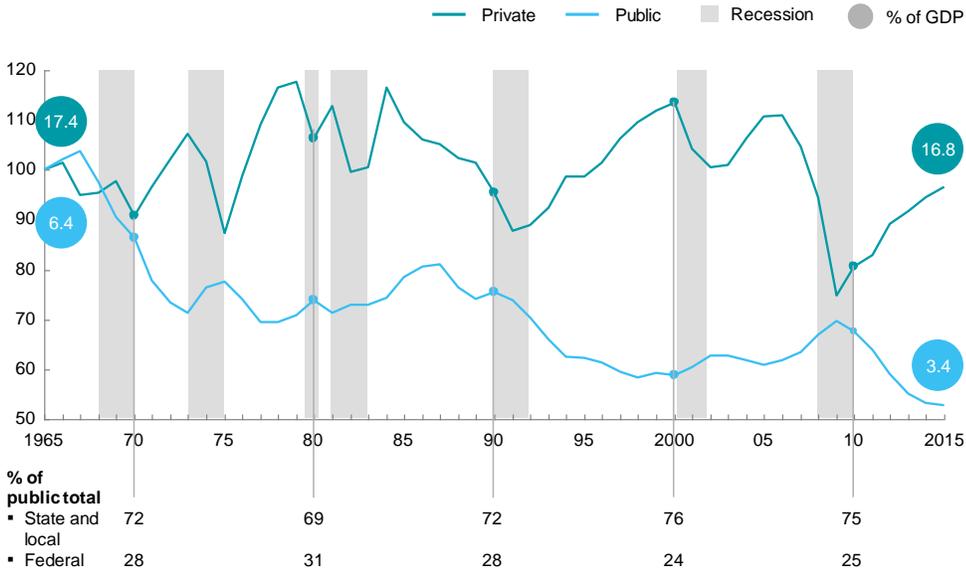
⁴⁶ US Department of Transportation, Table 1-72: Annual Highway Congestion Cost.

Exhibit 8

Public investment cratered from 1965–80 and has slowly declined since then, while private investment has fluctuated historically but grew during the recovery

Gross investment as a portion of GDP

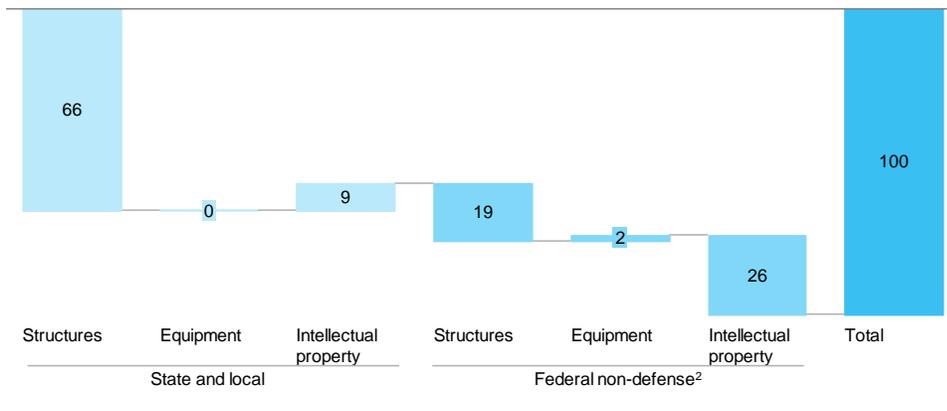
Index: 100 = 1965



The relative decline in state and local spending on structures has driven two-thirds of the overall decline in non-defense public investment since 1965

Public investment decline as a share of GDP, by type¹

%



¹ In absolute terms, the amounts spent on these categories continue to rise year over year; however, as a percentage of GDP, they continue to fall. Calculated as the change in percent of GDP between 1965 and 2015, weighted by the relative size of the category in 1965.
² Excludes all defense spending, e.g., aircraft, tanks, military facilities, etc.

SOURCE: US Bureau of Economy Analysis; McKinsey Global Institute analysis

In addition to their growing infrastructure needs, thriving US cities face another significant challenge: a shortage of affordable real estate for residential and commercial use. In the face of skyrocketing rents, a record 11.4 million households spent more than half of their income on housing in 2014.⁴⁷ The affordability gap—measured as the difference between market price of housing and income available for housing expenses—is larger in San Diego, Boston, and San Jose than in London, Paris, and Tokyo. A new development on Manhattan’s East Side offering means-tested affordable units at \$900 to \$1,900 a month received 60,000 applications for 14 units.⁴⁸ On the commercial side, real estate

⁴⁷ *State of the nation’s housing 2016*, Joint Center for Housing Studies at Harvard University.

⁴⁸ Ronda Kaysen, “Leasing begins for New York’s first micro-apartments,” *The New York Times*, November 20, 2015.

prices in large cities such as New York, San Francisco, Chicago, and Los Angeles have surged to pre-2008 levels (or even higher). But smaller cities have seen a run-up, too; commercial lease rates are at multiyear highs in Portland, Denver, and Nashville. The high cost of real estate raises the costs of doing business in these cities and forces smaller firms out to cheaper locations on the outskirts.

The high cost of housing acts as a drag on the economy by leaving households with less income for consumption. It also limits their mobility. Because there are sharp city-level differences in productivity, the free flow of workers between locations aided labor market efficiency and helped drive productivity growth for decades. Now, however, rapidly escalating housing costs have contributed to a historic decline in geographic mobility. The overall US mover rate, which tracks the number of individuals relocating in a given year, is near 12 percent, down from 20 percent in the mid-1960s.⁴⁹ This rate is even lower among less educated and lower-income segments of the population, who are increasingly stuck where they are and priced out of regions where they might find better opportunities. Those who do move to the fastest-growing cities are increasingly forced to live on the outskirts and accept long commutes, which eats into their productivity and adds to congestion for everyone.

There have been repeated calls to renew investment in infrastructure—including concern from the business community, as our CEO interviews highlighted. But little has been accomplished, which reflects the many challenges involved in the infrastructure sector. Projects touted as being “shovel-ready” often yield low returns in terms of productivity gains. Conversely, higher-return long-term projects take years to get to the starting gate, therefore offering less immediate demand stimulus. Low and declining construction productivity, and frequent cost and schedule overruns, make transportation and housing projects alike seem like risky bets. Protracted and expensive development and permitting processes inhibit the participation of private investors, as do the relatively low returns that some infrastructure projects provide, even in low-yield environments. Political and regulatory risk can also be high, especially with overlapping jurisdictions in metropolitan areas that require the alignment of several stakeholders before projects can be approved and executed. The possibility of local resistance to any type of new development is an ever-present concern.

But addressing the transportation infrastructure and real estate gaps in US cities would have an immediate and tangible effect for households, employers, and the broader economy. Urban GDP growth has recently averaged 2 percent annually, below the 2.8 percent annual growth of the mid-2000s.⁵⁰ Similarly, GDP per capita has been growing by an average of 1 percent annually, compared to 1.7 percent a decade ago, even as the costs of housing, education, transportation, and health care have continued to climb. The squeeze being felt by most Americans is particularly acute in the nation’s cities.

Inaction represents a considerable missed opportunity to kick-start demand and productivity growth and to take advantage of historically low interest rates. One of the CEOs in our interviews bemoaned the fact that the United States has been squandering a unique window to invest in modernizing the fundamental systems that allow businesses and workers to be more mobile and efficient. Allowing these systems to deteriorate ultimately raises the costs associated with repairing or replacing them. Furthermore, infrastructure investment offers one of the clearest and most targeted routes to jumpstarting growth. It delivers a uniquely powerful one-two punch: immediate job creation and demand stimulus plus a long-term boost to productivity and investment.⁵¹

⁴⁹ Community Population Survey, Table 16, Table 23, US Census Bureau.

⁵⁰ US Bureau of Economic Analysis.

⁵¹ A large body of economic evidence has established that public investment is a significant driver of productivity growth over the long term. See, for example, Kevin J. Stiroh, “What drives productivity growth?” *Economic Policy Review*, Federal Reserve Bank of New York, March 2001.

MGI estimates that increasing infrastructure investment by one percentage point of GDP could generate an additional 1.5 million direct and indirect jobs, putting people to work and boosting incomes and demand. Combining this effect with the productivity benefits yields a socioeconomic rate of return of around 20 percent. In other words, one dollar of infrastructure investment can raise GDP by 20 cents in the long run.⁵² We estimate that closing the investment gap in urban infrastructure and affordable housing can raise GDP by \$340 billion to \$450 billion annually by 2025. Conversely, continued underinvestment bakes lower productivity into the future. It is vital to look at infrastructure through a new lens, considering not just today's expenditures but the full opportunity costs of forgoing modernization in terms of lost future growth and competitiveness.

ENABLING PROGRESS THROUGH POLICY

Urban transportation infrastructure and real estate need to be examined and planned in tandem to address congestion, costs, and livability. They share common problems, including the high cost of land, the possibility of public resistance, protracted approval processes, and poor productivity performance in the construction sector, which increases costs and delays. Many of the strategies that could yield progress in these areas are also similar. Both would benefit from a focus on density that includes more multifamily dwellings in existing zones, intensifying development around transit hubs, and local zoning reform. Recent research from MGI estimates that these three initiatives could pave the way for creating more than five million housing units in California alone over the next decade.⁵³ Cities such as Fresno have begun to overhaul land use and zoning codes that encouraged sprawl, promoting density through faster land use approvals, reallocation of public land, and negotiating the use of idle private land for urban development. But most urban areas struggle with these issues.

Much of the real work of building infrastructure and housing happens at the local level, and this means that highly technical projects are overseen by hundreds of city and county agencies with widely varying capabilities. Many of them simply don't have the expertise and resources they need to get the job done. A major step forward would be the creation of learning institutions where public officials could gain the know-how they need and agencies across the country could share best practices. The collection and sharing of richer data on usage patterns could also help improve the performance of existing urban road, bus, and rail networks, leading to more efficient operation, smarter pricing, and higher utilization.

When public budgets are tight, it is imperative that money is spent more effectively and that projects do not spiral out of control. McKinsey's work with infrastructure agencies around the world has shown that stronger governance and oversight can improve productivity and lower costs by up to 40 percent. Part of that effort involves demanding better performance from the construction industry, where productivity growth has flatlined for decades. The sector as a whole needs a major push for modernization, technology adoption, and standardization. Governments and developers also have to transform the institutions and processes under their direct control. Realizing cost savings may involve shifting to a systematic and data-driven process for choosing the right projects from the outset; tightening management of the delivery and execution stages; and accelerating environmental reviews, approval processes, and land acquisition. Incorporating more sophisticated technology tools, such as building information modeling systems, project dashboards, and digital technologies including the Internet of Things, could produce a leap forward in planning, review, and management capabilities.

Another opportunity lies in making infrastructure projects more economically attractive by developing new revenue and profit streams, for instance by bundling real estate and transit infrastructure projects. Hong Kong is a notable example: its urban transit authority has capitalized on the increase in property values created by proximity to transit and high-quality urban design to attract public and private

⁵² *Bridging global infrastructure gaps*, McKinsey Global Institute, May 2016.

⁵³ *A toolkit to close California's housing gap: 3.5 million homes by 2025*, McKinsey Global Institute, October 2016.

capital. In the United States, cities such as Denver and Portland have also initiated transit-oriented development projects.

These initiatives could also make infrastructure more attractive to institutional investors (such as insurers, pension funds, and sovereign wealth funds) that are seeking opportunities to put their capital to work. Banks and institutional investors have \$120 trillion in assets under management and need solid long-term investment options, particularly because future returns on traditional equity and fixed-income investments are likely to be lower than those posted in the past 30 years.⁵⁴ Today private investors do not find a sufficient pipeline of well-prepared, bankable projects that provide appropriate returns given the complex risks involved—meaning that the costs of project delivery have to come down, user fees have to be generated, or projects will have to include new types of revenue streams in order to attract private capital. Most government agencies do not have experience in designing projects with these characteristics, but building and pooling these capabilities will be key to mobilizing private capital that can augment public investment. A better flow of finance, combined with measures to transform project selection, delivery, and operations to make that capital as productive as possible, could begin to close the nation's infrastructure gaps.

⁵⁴ *Diminishing returns: Why investors may need to lower their expectations*, McKinsey Global Institute, May 2016.

4. CREATING NEW PATHWAYS FOR AMERICAN WORKERS

Building the skills that lead to readiness for employment, career progress, and the ability to innovate is an important part of securing the nation's economic future—and creating more widely shared prosperity. But education budgets have been a casualty of the general decline in public investment, with many states cutting funding for public universities and community college systems alike. One study found that 45 states spent less per student in the 2015–16 school year than they did before the recession.⁵⁵

Public universities have long provided a relatively affordable pathway to higher education, but budget cuts have driven tuition at these institutions to an average of \$9,410 a year for in-state students. (The average cost of attending a private college or university has skyrocketed to \$32,405 a year.⁵⁶)

Improving college affordability is one clear way to alleviate the squeeze on households and restore one of the country's traditional pathways to upward mobility. In addition, student loan debt has ballooned to \$1.26 trillion, dampening consumption and household formation by young people.⁵⁷ Devising some form of equitable student debt relief (such as refinancing to lower interest rates or spreading payment over longer terms) would also remove a large constraint that has been depressing household demand.

But education funding is only one piece of the puzzle. The United States needs to create a more cohesive and effective system of skills development and training overall. This obviously needs to start at the K-12 level (or even preschool) to ensure that all students have a solid foundation. However, improving K-12 outcomes is a long-term undertaking that is beyond the scope of this paper. That is also the case with an imperative at the other end of the education pipeline: the need to increase the number of two- and four-year degree holders in science, technology, engineering, and math (STEM) disciplines. Among countries with large numbers of college graduates, the United States ranks in the bottom quartile for STEM graduation rates. Only 15 percent of US college graduates have STEM degrees, compared with 22 percent in the United Kingdom and 35 percent in South Korea.

In addition to these longer-term goals, there are strategies for improving the US system of human capital development and creating a more flexible labor market that could have a more immediate effect. The United States needs to create multiple pathways and clearer maps to good jobs.

An alarming number of young people enter college with the intention of improving their job prospects but struggle to complete their degrees. Just 39 percent of college students complete bachelor's degrees within four years, and 59 percent finish within six years.⁵⁸ Given the cost of higher education, this trend has to be addressed. Change is needed at the K-12 level to ensure that more incoming students are actually college ready. But colleges themselves may need to rethink retention strategies, support programs, and course requirements. Institutions such as Arizona State University and Austin

⁵⁵ See *Recent deep state higher education cuts may harm students and the economy for years to come*, Center for Budget and Policy Priorities, March 2013. The report finds that state funding for higher education declined by 28 percent per student from 2008 to 2013. Two states—Arizona and New Hampshire—cut higher education spending per student in half during this period.

⁵⁶ *Trends in college pricing 2015*, The College Board. These tuition figures do not include room, board, or other fees.

⁵⁷ *Quarterly report on household debt and credit*, Federal Reserve Bank of New York, May 2016. The volume of student debt has nearly quadrupled since 2000, and default rates have risen to their highest level in two decades. See Adam Looney and Constantine Yannelis, *A crisis in student loans? How changes in the characteristics of borrowers and in the institutions they attended contributed to rising loan defaults*, Brookings Papers on Economic Activity, fall 2015.

⁵⁸ National Center for Education Statistics (data for bachelor's degree programs refer to 2007 cohort, data for two-year degree or certificate programs refer to 2010 cohort).

Peay State University, for example, have begun employing big data tools to guide individual students on the path to a degree, monitoring their progress toward requirements for their major, recommending courses, and identifying those who might need mentoring.⁵⁹

College graduates on average do earn a wage premium compared with less educated workers. But many graduates are struggling in the workforce. One-third of graduates with associate degrees earn less than the median wage for high school graduates.⁶⁰ More than one-quarter of those holding bachelor's or advanced degrees earn less than the median annual wage for two-year associate degree holders. For these four-year graduates, personal choices to go into lower-paying fields or to live in areas with lower wages account for only half of the relative pay gap. A great deal of the rest is due to some combination of a lack of relevant skills and a lack of opportunity. Students could make more informed choices about the most appropriate post-secondary options for their goals if they were armed with better knowledge of the job market realities associated with various majors and educational institutions (and with better counseling about taking on student loan debt).

In the real world, not every job utilizes the knowledge that a four-year degree represents. But the share of job openings requiring these credentials has been rising sharply, putting opportunities out of reach for millions. If employers are encouraged to look beyond these traditional markers, take advantage of new technology tools for evaluating natural talent, and undertake more training themselves, the results could benefit US companies and job seekers alike. Although the underemployment rate has been improving since 2014, one analysis found that more than 40 percent of recent US graduates from bachelor's degree programs were in jobs that do not require a four-year degree.⁶¹

The United States urgently needs to create more pathways to solid jobs that do not follow the traditional four-year degree track. This applies not only to today's students but also to the millions of midcareer workers who will need to adapt and learn new skills in an era of accelerating technology-driven change and automation. Expanding the role of community colleges could be pivotal. Only about 10 percent of the adult population in the United States holds two-year associate or equivalent degrees (Exhibit 9). This is a much lower share than in countries such as Canada and Japan.⁶² Many jobs that employers struggle to fill—such as positions for skilled tradesmen, machine operators, and commercial drivers—do not require college degrees. They can be filled by workers who complete short-term, industry-specific training programs.

Recent MGI research has estimated that some 60 percent of occupations in the United States could have 30 percent or more of their activities automated by currently proven technologies.⁶³ Historical job displacement rates could accelerate sharply over the next decade, creating increased churn in the labor market. It is already apparent that workers in manufacturing industries that were affected by foreign competition have faced enormous difficulty in transitioning to new roles—and we expect automation to create disruption in the job market on a much bigger scale.

⁵⁹ "Big data on campus," *The New York Times* (with *The Chronicle of Higher Education*), July 18, 2012.

⁶⁰ *Game changers: Five opportunities for US growth and renewal*, McKinsey Global Institute, July 2013.

⁶¹ Jaison R. Abel and Richard Deitz, "The class of 2015 might have a little better luck finding a good job," Liberty Street economics blog, Federal Reserve Bank of New York, May 15, 2015.

⁶² *Game changers: Five opportunities for US growth and renewal*, McKinsey Global Institute, July 2013.

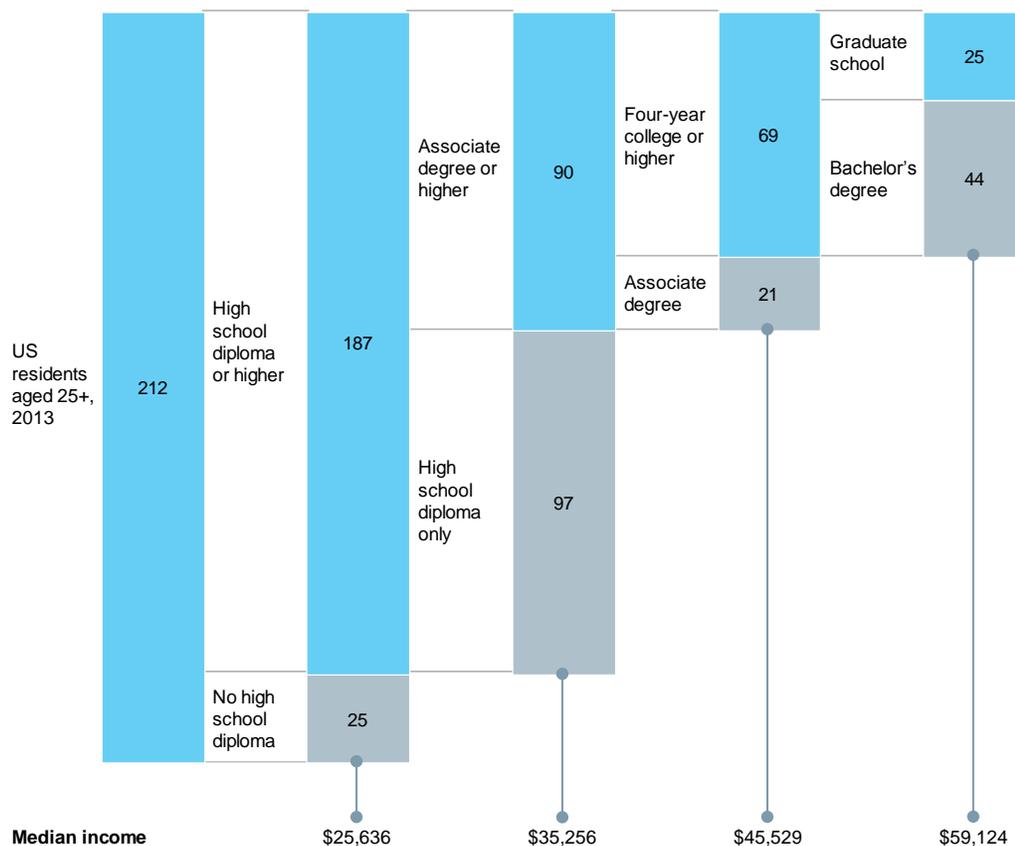
⁶³ For more on this issue and the underlying analysis, see Michael Chui, James Manyika, and Mehdi Miremadi, "Four fundamentals of workplace automation," *McKinsey Quarterly*, November 2015. Some 45 percent of work tasks can be automated with currently demonstrated technologies.

Exhibit 9

120 million Americans have a high school diploma or less, hindering their employment prospects and earning potential

US residents age 25+, by educational attainment, 2013

Million



SOURCE: US Bureau of Economy Analysis; US Census Bureau; McKinsey Global Institute analysis

Creating a more comprehensive and responsive system of retraining is a central strategy for assisting workers affected by technological change. Over the medium to long term, if displaced workers acquire the capabilities and training they need for new jobs, the overall productivity of the US labor force could increase, potentially adding \$600 billion to \$700 billion to annual GDP by 2025. The United States has to create a more flexible labor market to help workers adapt to this new and fast-changing world.

ENABLING PROGRESS THROUGH POLICY

Making the US economy more dynamic and inclusive depends on creating an efficient labor market that connects more workers with better jobs, restores their mobility, and ensures that employers can find the skills they need. Every CEO we spoke to emphasized the importance of developing a highly skilled workforce to position the economy for growth and productivity gains.

There are a number of issues that merit policy attention. First, a proliferation of occupational licensing requirements increasingly creates barriers for workers who want to change jobs, start new careers, or move across state lines. The US Bureau of Labor Statistics recently released data showing that approximately one-quarter of US workers now hold an occupational license or certificate, up from about 5 percent in the 1950s. While some of these credentials provide important assurances of consumer safety, imposing licensing requirements on too many occupations, with standards that vary across states, erects unnecessary hurdles for workers who aspire to enter a new profession or to move. The federal government has begun to examine the feasibility of dismantling some requirements

and making other licenses portable. Accelerating this effort would be a simple step toward improving worker mobility.

Second, the United States needs a wider variety of career paths, including expanded short-term training options. These can take many forms: larger companies can offer their own in-house instruction or partner directly with local schools, or employers in the same industry can develop joint programs. A successful example of this approach is AMTEC, a consortium of automotive manufacturers that has teamed up with community colleges to train skilled automotive workers. One of the CEOs we spoke to described his company's investment in a similar program to create its own pipeline of skilled employees. There is tremendous room for the private sector to play a greater role in educating and training the US workforce, both in and out of the classroom, and the government can play a role in convening and mobilizing more of these initiatives. Many certificate holders eventually earn more than college graduates; metalworking certificate holders, for instance, earn annual wages of more than \$45,000, which is the median wage of 25- to 34-year-old bachelor's degree holders. Because these credentials are nationally administered (in this case by the National Institute for Metalworking Skills or the American Welding Society), certificate holders obtain both marketable skills and the ability to work anywhere in the country.

"Earn while you learn" apprenticeships are not as widely utilized in the United States as in other advanced economies, but they could help workers gain portable credentials without excessive student debt. The number of students in apprenticeship programs in the United States is much lower than that in Germany—although it is growing, under the auspices of state-level programs and federal initiatives such as ApprenticeshipUSA.⁶⁴ Germany's dual system of education, for example, combines high-quality vocational training with apprenticeships in one of nearly 350 nationally recognized occupations. These programs are closely aligned with the broader secondary and post-secondary education system. This approach requires private-sector investment, but participating companies are rewarded with a well-trained talent pool. Most of the dual system training in countries such as Germany, Austria, and Switzerland, for example, is run by companies. The United States spends considerably less per capita on vocational training and apprenticeships than other advanced economies. But funding is not the only role for government. It also has a role to play in establishing and sharing best practices across states and among employers.

Third, the growing role of online talent platforms as one of the main mechanisms for hiring in the United States offers an opportunity to use the power of the Internet to improve the matching of employers and job seekers, eliminating some of the inefficiencies and dysfunctions in the labor market.⁶⁵ As these platforms grow in scope, we are gaining more comprehensive and detailed data about educational outcomes, skills, and career paths. It is already possible to track where the graduates of a given institution wind up in the labor market. Putting this data to work could empower individuals with better information—but only if they have the digital access and digital literacy to exploit the opportunity. Regulations governing data ownership and privacy will also need to be clarified so that innovators can better analyze the rich troves of data on skills, demographics, open positions, and career pathways to provide real-time insights. Educators and vocational training providers can make use of this data to shape their offerings—and they could be held to a new standard of accountability as the outcomes associated with specific institutions and degree programs become more publicly

⁶⁴ *Game changers: Five opportunities for US growth and renewal*, McKinsey Global Institute, July 2013.

⁶⁵ *A labor market that works: Connecting talent with opportunity in the digital age*, McKinsey Global Institute, June 2015.

transparent. Over the longer term, the overall mix of skills in the workforce could adapt to meet the needs of the economy more dynamically.⁶⁶

And finally, policy makers will also need to focus on the growing share of independent workers in the US labor force. Some 10 to 15 percent of the US working-age population engages in independent work to earn their primary income, and a recent MGI survey indicates that many workers in traditional jobs actually want to become free agents. Fast-growing digital platforms for providing services on demand may expand the possibilities for doing so.⁶⁷ The growth of independent work and alternative working arrangements could be a positive development for increasing labor force participation, but it will be critical to examine the US system for delivering benefits such as disability insurance, retirement plans, unemployment insurance, and family leave. Designing a system of more portable benefits could make it possible for independent workers to achieve a greater degree of economic security.

⁶⁶ Michael Spence and James Manyika, "Job-saving technologies," Project Syndicate, October 15, 2015.

⁶⁷ *Independent work: Choice, necessity, and the gig economy*, McKinsey Global Institute, October 2016.

5. FACILITATING A RESOURCE REVOLUTION

The resources sector—which includes energy and mining firms, utilities, farm producers, and resource-intensive manufacturing firms—accounts for only 4 percent of employment and 8 percent of GDP in the United States. But it exerts disproportionate economic influence. The sector accounts for \$5.5 trillion of net capital stock in the United States, or one-third of all tangible capital investment by the private sector excluding real estate. Resources account for 40 percent of the input costs incurred by food, construction, and transportation firms, indirectly affecting the largest items in the average American household's budget. The productivity performance of the resources sector can therefore have an enormous impact on other sectors and on households.

Over the past decade, the sector has been making remarkable strides in productivity, although this story has been overshadowed by volatility in global markets. The biggest leap forward came in the form of technological advances in horizontal drilling and hydraulic fracturing that unleashed a shale boom. Between 2007 and 2012, North American gas production from shale deposits grew tenfold, and oil production grew even faster. By 2015, the United States had surpassed Russia and Saudi Arabia as the world's largest producer of petroleum and natural gas hydrocarbons. But as suppliers ramped up production, global demand growth slowed, causing a tremendous loss of value in the sector. Publicly listed energy firms lost one-third of their market capitalization between 2014 and 2015 and have seen falling returns on invested capital. A major driver of investment in the US economy has stalled along the way.

While attention has been focused on the dramatic “super cycle” of rising and falling global commodity prices, the resources sector has continued to make advances. Impressive as it is, the US shale story is only one part of a bigger wave of global innovation that has the potential to raise productivity, attract investment, and create huge long-term economic benefits. The United States has an opportunity to become more efficient in how it produces, delivers, and consumes resources overall.

This global “resource revolution” could result in divergent fates for various energy sources. Returns in the sector may shift from the resources themselves to the technologies used to develop and consume them. Natural gas may continue to displace coal in electric power generation and see greater use as a feedstock for the chemical industry. Demand for oil could slow as electric vehicles, car-sharing applications, higher fuel efficiency standards, and tech-enabled efficiencies take hold. Some estimates suggest that electric vehicles could go from less than 1 percent of total new car sales in 2015 to 35 percent worldwide in 2040, potentially reducing crude oil consumption.⁶⁸ Additionally, autonomous vehicles, which are estimated to be 15 percent more energy efficient than today's cars, may make up almost 10 percent of new car sales by 2035. Automation and robotics can reduce energy consumption in advanced manufacturing by 10 to 30 percent. Other technologies such as the Internet of Things could further compress consumer demand by making homes, offices, and worksites more energy efficient.

On the supply side, technological innovation is improving efficiency for producers as well. The cost of production is falling as the sector reverses a decade-long trend of declining productivity.⁶⁹ High-resolution seismic imaging and surveying drones are just a small sample of the technologies that are transforming exploration and production. Meanwhile, renewable energy sources are also becoming more cost competitive as their usage grows, costs fall, and producers reach scale.

⁶⁸ “Electric vehicles to be 35% of global new car sales by 2040,” Bloomberg New Energy Finance, February 25, 2016.

Given that battery electric vehicles still require electricity, their reduced crude consumption will spur a corresponding increase in electricity consumption.

⁶⁹ US Bureau of Labor Statistics.

These shifts are likely to have lasting effects on US resource producers, utilities, and households. US demand for electricity is expected to stay flat over the next two decades, driven by slower overall economic growth, lower resource intensity in demand, and gains in energy efficiency.⁷⁰ The productivity impact has been significant for some energy producers: in oil and gas extraction, US labor productivity fell 4 percent a year between 2002 and 2012, only to rebound at 12 percent annually since 2012.⁷¹ The shale boom was sustained by rapid efficiency gains and cost declines. As a result, many of the largest basins are becoming financially viable with crude oil benchmark prices at \$50 to \$60 per barrel. At the current pace of cost reductions, solar and wind could be broadly competitive with the marginal cost of coal and natural gas across the United States without subsidies by 2025. The nation's utility-scale solar power generation grew from 400 GWh in 2010 to 23 TWh in 2015; wind grew from 94 TWh to 190 TWh.⁷²

An underappreciated revolution is unfolding, driven by competition among fuel sources, technology-driven end use efficiency, consumer sophistication, and the continuing shift to a more service-oriented US economy. All of these trends weaken the link between economic growth and resource demand. The United States could be on the brink of realizing a major resource productivity opportunity—one that can potentially unlock economic value throughout the resource value chain to the tune of nearly \$400 billion annually by 2025.

This development can also produce additional gains in the form of consumer savings and improved environmental outcomes. US greenhouse gas emissions, for instance, have hit 20-year lows. But continued progress is not a given; policy makers will need to ensure that barriers do not slow or prevent some of the necessary transitions, potentially locking up hundreds of billions of dollars in stranded assets. It is imperative to smooth the process of shifting the sources in the nation's energy mix and to take advantage of rapid technology changes.

ENABLING PROGRESS THROUGH POLICY

The United States will encounter more opportunities to improve resource productivity in the years ahead. The key will be recognizing and responding to them in a way that allows the sector to innovate at the speed of technology development and to take advantage of trends in demand. Today some of the challenges include the difficulty of permitting for new energy generation and transmission facilities, misaligned incentives for investments in energy efficiency, and the burdensome wind-down process for inefficient operations that are assuming losses. These barriers contribute to higher costs for consumers and lower returns to the industry. There is a clear role for policy in addressing many of these challenges.

First, policy can help to reduce frictions and transaction costs as capital and resources shift to different sources of energy supply—and it can do so while continuing to take an “all of the above” approach that does not prematurely pick winners and losers. Regulatory bodies will need to be responsive and far-sighted in enabling capital to flow quickly into the most promising opportunities. Reducing transaction costs for firms as they open and close plants, acquire the necessary permits, and dispose of hazardous or unneeded materials would allow the sector to become more nimble and innovative.

As the sector evolves, the nation's energy portfolio will naturally rebalance—and this will have an impact on workers and towns, just as surely as technology and globalization have caused dislocations. This will call for finding ways to mitigate the impact of shutdowns and transitions on displaced workers and affected communities while also addressing issues of overcapacity, stranded assets, pensions, and other financial and environmental liabilities. These may involve additional trade-offs—for instance,

⁷⁰ 2016 annual energy outlook, US Energy Information Administration.

⁷¹ Ibid.

⁷² US Energy Information Administration, Electric Power Monthly, Table 1.1.A. Net generation from renewable sources: Total, 2006–2016, July 2016.

speeding up the closure of “zombie mines”—that will require creative policy solutions to balance short-term financial costs with long-term benefits.

The recent downturn in coal demand and prices, for example, has led three of the largest US coal companies to file for bankruptcy since 2015. For these companies, unwinding unprofitable coal mining operations can be a lengthy and burdensome process. To avoid assuming nearly \$100 billion in state and federal environmental liabilities, coal producers are instead continuing to operate inefficient mines as they hemorrhage cash and continue to impact the environment. Smoothing the transition between individual plants and sources of energy would allow for more efficient capital allocation within the energy sector, boost productivity, and support long-term sustainability objectives.

The United States has already pulled off this kind of transition. The recent shale boom overlapped with a period of rapid growth in renewables and energy efficiency. Many federal and state agencies showed they could move quickly when presented with the opportunity for expanded shale operations. In the past decade, faster permitting and review processes and coordination at the federal and state level have resulted in approvals for drilling wells, storage facilities, export terminals, and pipelines. The United States managed to boost shale production, develop clean technologies, and reduce greenhouse gas emissions simultaneously. The resource revolution is ongoing, and it needs room to play out.

Policy can also address the future potential for distortion in the utility markets. Utilities are unique institutions given their role as a “public good” provider, heightened levels of regulation, need to recoup the cost of large capital outlays, and varying levels of private, quasi-public, and public ownership. For utilities, adopting new generation and distribution technology and coping with end-user demand shifts will require ongoing regulatory dialogue to ensure grid stability, financial viability, and consistent service to all customers. Policy makers will have to balance these interests for the lowest economic cost and highest efficiency of resource use.

Utilities are highly capital-intensive businesses, and the current rate structure covers their capital costs by spreading them out over electricity consumed on a per kWh basis. If a household or business installs solar panels and storage on its premises, it may consume less net electricity—thus covering a smaller share of the utility’s capital costs. As adoption of private generation sources increases among those who can afford it, the burden of covering utility capital costs will fall to those who cannot. A study by the Berkeley National Laboratory suggests that a 2.5 percent penetration rate of home-installed generation sources would reduce the earnings of a utility by 4 percent.⁷³

To address this issue, a number of interventions could be explored. These include redefining rate structures for distributed power, creating a more flexible rate structure such as time-of-use pricing to drive efficiency and demand management, and expanding storage to balance the load and avoid massive spikes in demand. Renewable subsidies may need to be revised to encourage higher adoption of the most economic solutions.

The relationship between the energy markets and economic growth is complicated. The shale boom created significant economic benefit in the form of higher investment, jobs, and income growth. As opposed to public investment and global trade, both of which are designed to boost aggregate demand in the short term and productivity in the long term, many resource productivity measures are actually about right-sizing or reducing demand—but they can still have significant economic impact. In the short term, redirecting household spending away from energy to areas of the economy with higher multiplier effects (such as services and retail consumer goods) could be beneficial. In the long term, these actions will create a more stable, productive energy sector that is less susceptible to shocks and fluctuations in global commodity markets. Similar to infrastructure renewal, a more productive energy

⁷³ Andrew Satchwell, Andrew Milles, and Galen Barbose, *Financial impacts of net-metered PV on utilities and ratepayers: A scoping study of two prototypical U.S. utilities*, Ernest Orlando Lawrence Berkeley National Laboratory, September 2014.

and resource sector will reduce input costs and drive productivity gains across all other sectors, all of which rely on the energy sector in some capacity or another. These productivity gains trigger a virtuous cycle, producing savings for consumers and businesses that can be recycled into consumption, further boosting aggregate demand.

CONCLUDING THOUGHTS

There is no denying that the United States today is a house divided. Growing inequality has gone hand in hand with deeper political polarization. Economic anxiety seems to have ratcheted up a host of social ills, from deteriorating race relations to the prevalence of substance abuse. Even some relatively prosperous Americans worry about losing their foothold to such a degree that they are increasingly willing to slam the door on those who need an opportunity.

Healing those rifts is far beyond the scope of this economic brief. But America stands a much better chance of bridging its divides against a backdrop of dynamic growth. The United States is built on free enterprise and individualism, but its growing disparities are antithetical to the ideals that everyone is on equal footing and deserves the opportunity to reach their full potential. That is the delicate balance of steering the economy: getting out of the way so that US businesses and cities can innovate, but doing more to ensure that growth is inclusive and the safety net is strong enough to support everyone who needs it. If the next administration can strike that balance and restore a more broadly shared sense of prosperity, the nation may be able to mend some of its frayed ties.

Where belt-tightening has led to a spiral of weak demand growth and deteriorating fundamentals, focusing on investment and innovation-based productivity could set off a virtuous cycle of sustainable growth and better jobs. This effort can be designed at the federal level but mobilized at the local level by governments and businesses working together.

In addition to the opportunities outlined in this document, the US economy needs a more fundamental reorientation. Administrations run for only four years, businesses feel the weight of quarterly earnings expectations, and change is accelerating on all fronts. But if every stakeholder across the economy focuses on the short term, long-term priorities are neglected. Some investments take many years to pay off, but they are still important to undertake. A long-term orientation on the part of public and corporate governance institutions would benefit the economy.

The United States also needs to take steps to restore dynamism, creating an environment that fosters new business creation, greater geographic, cross-sector, and social mobility, and healthy competition. To that end, ensuring broad-based participation in all areas of the economy is critical. This can take many forms: encouraging more workers to participate in the labor force, enabling them to move to more productive jobs and locations, creating a level playing field for new businesses to start and grow quickly, promoting greater competition even in non-traded activities, and helping once-declining cities reinvent themselves through investment and global engagement.

The agenda we propose is only a starting point. While some foundational cracks in the economy need to be shored up, that is not meant to imply limitations on the ability to pursue big ideas. The nation that built the interstate highway system and the Internet, cracked the human genome, and made its way to Jupiter does not have to shy away from the next moon shot. A number of ambitious initiatives—such as the efforts to map the human brain and to find a cure for cancer—are currently under way. But non-defense R&D investment remains below pre-2008 levels in real dollars. A renewed infusion of funding and resources directed toward scientific inquiry could tackle any number of challenges, from mitigating climate change to finding a treatment for Alzheimer's disease that could improve the quality of life for an aging population.

The current period of slow growth has produced a school of thought that says the nation's best days are behind it. We strongly disagree. The United States is still one of the most resilient and innovative economies in the world, and there are too many breakthroughs and new market opportunities on the horizon to settle for stagnation. Pursuing an ambitious growth strategy and investing for the future could position the US economy to confound the pessimists once again.

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