

**MCKINSEY GLOBAL INSTITUTE**

# **SECULAR STAGNATION AND LOW INVESTMENT: BREAKING THE VICIOUS CYCLE**

**DISCUSSION PAPER, DRAFT 2.0**

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# PREFACE

Roughly eight years after the global financial crisis, world GDP growth still leaves much to be desired. In advanced economies, notably Europe and the United States, employment rates are still below their pre-crisis peaks, and investment remains weak despite ultra-low interest rates. There is talk of secular stagnation.

This working paper offers a preliminary view of the various forces at work, drawing on a large body of McKinsey Global Institute (MGI) studies on topics including the European and US economies, infrastructure, corporate investment, digitization, housing, and debt and deleveraging. We also begin to explore whether current thinking and policy adequately reflect these issues and whether new approaches may be warranted. This research-in-progress is being published to coincide with the “Europe as an Investment Destination” conference organized by the European Political Strategy Center in Brussels on April 6, 2016, with the aim of triggering discussion and receiving feedback.

Jan Mischke, an MGI senior fellow based in Zurich, leads this in-progress research, under guidance from James Manyika, a McKinsey and MGI director, based in San Francisco; Eric Labaye, a McKinsey director and the chairman of MGI, based in Paris; and Jacques Bughin, a McKinsey and MGI director, based in Brussels. MGI senior fellow Sree Ramaswamy led the work on digital investment. We would like to thank MGI senior editor Lisa Renaud, editorial production manager Julie Philpot, graphics specialist Marisa Carder, and director of external relations Matt Cooke for their support.

This draft benefited from the advice of many experts in academia, government, and industry. Our particular thanks go to our academic advisors Laura D. Tyson, S. K. and Angela Chan Chair in Global Management at the Haas School of Business, University of California, Berkeley; and Martin N. Baily, Bernard L. Schwartz Chair in Economic Policy Development and senior fellow and director of the Business and Public Policy Initiative at the Brookings Institution. We are grateful for all of the input we have received, but the final report is ours and any errors are our own.



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# IN BRIEF

Advanced economies seem to be caught in a vicious cycle: Growth and aggregate demand are weak, which discourages businesses from investing and limits the household income available for residential investment and consumption—all of which further worsens aggregate demand and growth. This discussion paper investigates whether this cycle can be broken and how that could be accomplished. Among our findings:

- A long-term decline in investment has grown more pronounced in recent years. In Europe, business, residential, and public investment declined by €260 billion a year in real terms from 2008 to 2015. In the United States, net fixed capital formation decreased from 12 percent of GDP in 1950 to 8 percent in 2007, then fell to only 4 percent in 2014. There are multiple reasons for this decline, including shorter asset lifecycles, falling prices for capital goods, shifts in industry mix, short-termism, constraints on housing markets, public policy shifts, increasing risk spreads, and globalization. But our simple model suggests that slowing growth and a weak macro outlook might be the key driver. A prolonged lack of investment causes real damage to the economy, dampening demand in the short run and hollowing out productive capacity in the long run.
- Business investment often follows consumer demand, but structural forces have depressed that demand for decades as an increasing share of income went to high-income households that are less likely to spend it. Their savings was recycled into the debt of lower-income households. Since the crisis, heavy debt loads and the deleveraging process have weighed down growth. But it is important to note that those debts are mathematically equivalent to (non-equity) assets. Unless we can reduce debt levels relative to GDP by faster GDP growth or higher inflation, debt rates can only come down by reducing assets relative to income, which has implications for inequality.
- Public investment is down in both the United States and Europe since the crisis, despite ultra-low interest rates and a shortfall in demand. Increasing infrastructure investment is one obvious opportunity. Our estimates suggest an investment gap of 0.7 percent of GDP for the United States and 0.4 percent of GDP in the United Kingdom and Germany, for instance. While bringing in private finance has been much discussed, higher public investment could be encouraged even in the face of tight coffers. One option is to adjust public accounting standards to capitalize such investments on a balance sheet and depreciate them over the lifecycle of the assets. Further, adopting global best practices in project selection, delivery, and management of existing assets could reduce the cost of public works by 40 percent.
- On the business side, competitiveness in many industries is increasingly determined by digitization rather than investment in physical assets. In the past two decades, profit margins have grown 2-3 times faster than average in the most digitized industries, while productivity has grown 4 times faster. While some companies and sectors have surged ahead, the majority of businesses still have a long way to go—and they will need to invest in digitizing their operations to remain competitive.
- Residential investment has followed a boom-bust cycle. Particularly in major cities, there is a structural shortage of housing, mostly due to land restrictions. This is driving up prices to such a degree that home ownership is slipping out of reach for many households, which depresses overall residential investment.

While this paper is still preliminary, these findings raise fundamental policy questions. Is monetary policy focused on increasing financial liquidity and lowering interest rates suitable when none of these sectors seem actually sensitive to interest rates and financing? Is fiscal policy that hollows out public capital sustainable? Is structural policy focused on cutting red tape sufficient if it may amplify rather than resolve inequality and demand weakness in the short run? These questions will require deeper research and examination.



# SECULAR STAGNATION AND LOW INVESTMENT: BREAKING THE VICIOUS CYCLE

The persistence of lackluster growth and weak demand has left companies in Europe, the United States, and other major economies reluctant to invest. Household investment is also down as high costs put home ownership out of reach for a large part of the population. And fiscal worries have led governments to implement austerity policies.

Today those cumulative decisions have created a vicious cycle: anemic investment weakens aggregate demand and depletes the economy of its productive capacity, which in turn further slows growth, income, and investment. Concerns over secular stagnation are growing.<sup>1</sup> Ultra-low interest rates have failed to—and, in fact, cannot—spur a robust recovery in the real economy. It is critical to examine the deeper issues at work, identify some of the most promising opportunities for the public and private sectors, and consider bold new actions that can unlock investment and support a return to growth.

In the following pages, we will review the facts behind longer-term and more recent investment declines and assess the implications for the global economy. We will then look at the drivers of investment: the level of consumption underpinning investment decisions and its link to inequality, as well as investment by the public, business, and household sectors. We identify specific opportunities to generate momentum—infrastructure investment, digital investment, and residential housing investment—although this does not imply that other avenues not discussed here are of lesser importance. We conclude by raising fundamental questions regarding current policies and whether a change in direction is needed to spur growth. These questions will form the basis of a future research agenda.

## 1. RECENT INVESTMENT DECLINES FOLLOW LONG-TERM SECULAR DECLINES, HARMING THE GLOBAL ECONOMY

Investment by households, businesses, and governments has been on the decline in Europe as well as the United States. While this trend has been apparent for decades, the problem has grown more acute since the global financial crisis.

### 1.1. Investment has substantially declined

In Europe (the EU countries plus Norway and Switzerland), investment collapsed in the wake of the global financial crisis. Cumulative investment by the business, household, and public sectors declined by €261 billion a year in real terms from 2008 to 2015 (Exhibit 1). Active policies will be needed to stimulate investment and break this pattern.

- **Corporate investment** declined by €109 billion a year across Europe. At the same time, corporations have amassed more than €700 billion in excess cash. Our analysis of past crisis episodes shows that corporate investment always follows the recovery and never leads it. Survey findings confirm that the number one reason for low corporate investment is weak demand and an uncertain macroeconomic outlook.

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<sup>1</sup> See, for instance, Lawrence H. Summers, “The age of secular stagnation: What it is and what to do about it,” *Foreign Affairs*, February 15, 2016.

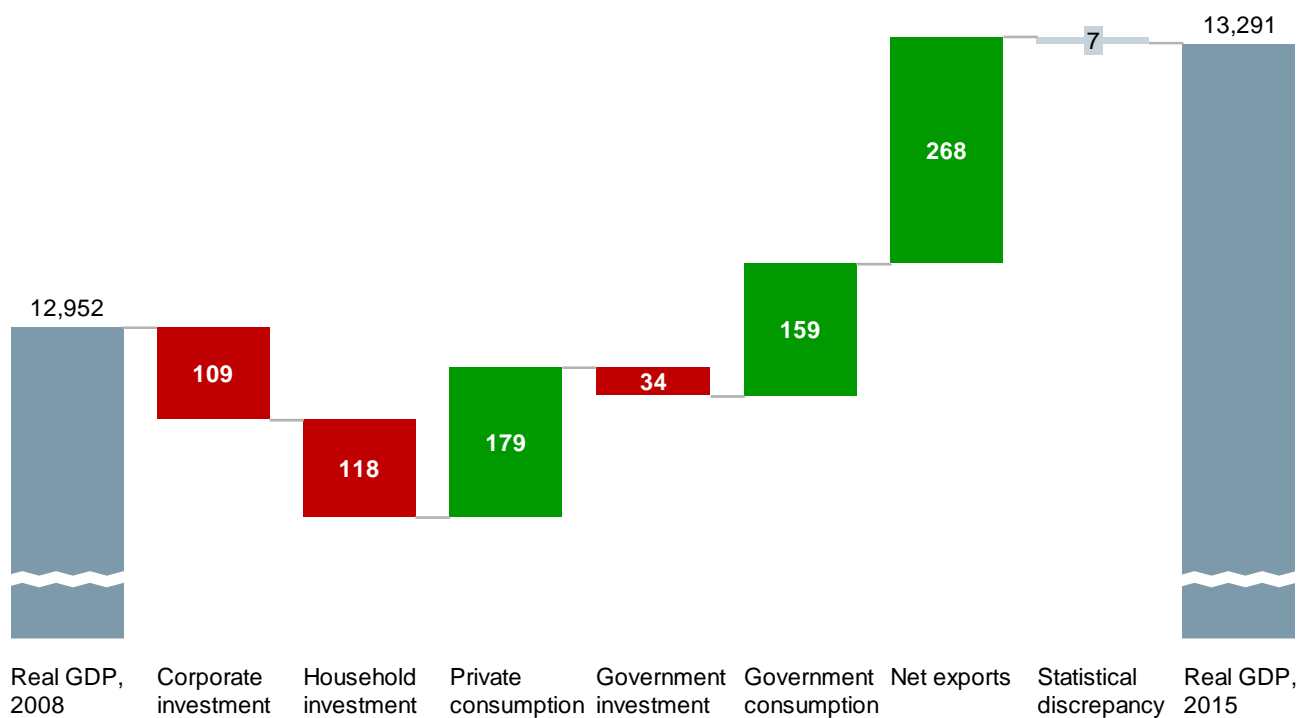


- **Household investment** fell by €118 billion a year. This decline is concentrated in those economies where the housing bubble was most pronounced (Spain, the United Kingdom, and Ireland). Today the United Kingdom has a severe housing shortage in London and the Southeast, mostly due to land market restrictions.
- **Government investment** has been slashed by €34 billion annually as policy makers opted for austerity even as public consumption increased. In net terms, public investment is now a mere 0.2 percent of GDP—a level barely sufficient to sustain existing capital stock. It has even turned negative in a number of economies, including Germany and Greece.

Exhibit 1

Since the crisis, investment has collapsed across all sectors in Europe

Change in real GDP, 2008–15  
 € billion, chain-linked 2005, Europe-30



NOTE: No split of investment (gross capital formation) by source in Eurostat; government/household/corporate split from European Commission AMECO database applied to Eurostat total investment figures. Numbers may not sum due to rounding.

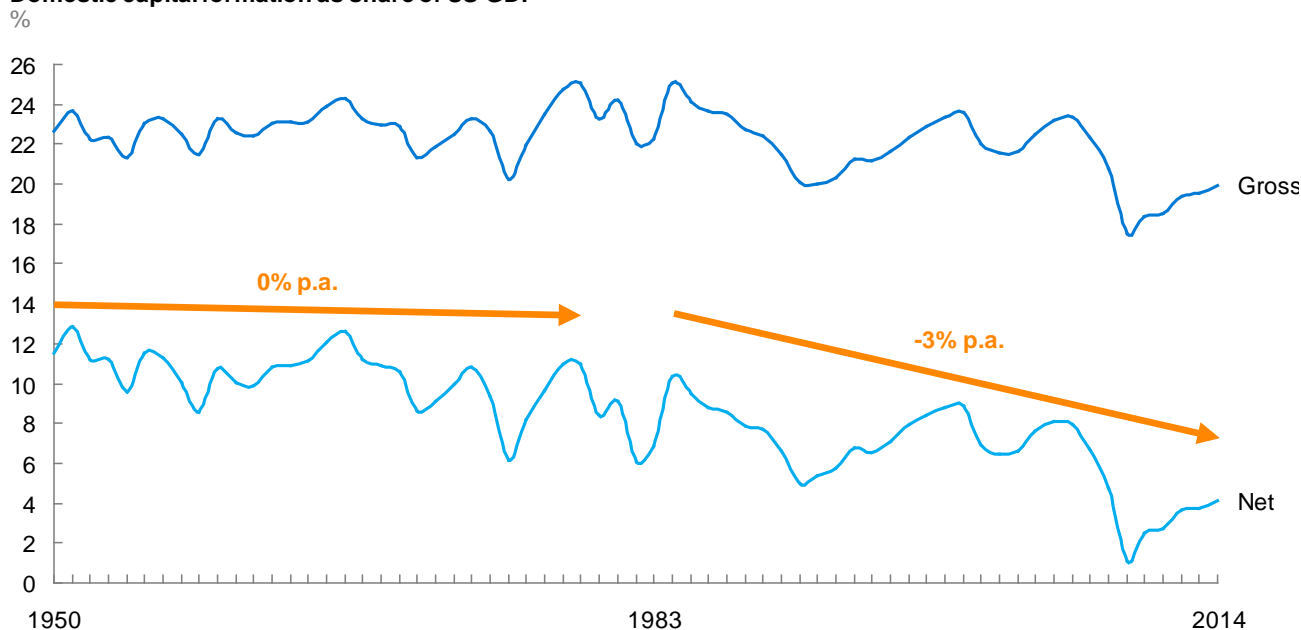
SOURCE: Eurostat; AMECO database; McKinsey Global Institute analysis

In the United States, gross fixed capital formation remained relatively steady at about 22 to 24 percent of GDP from the 1950s until 2010. It then collapsed to 18 percent in 2008 following the global financial crisis and has recovered to only 20 percent since then (Exhibit 2). After a precipitous drop of up to \$700 billion from 2007 to 2009, nominal investment once again exceeded its pre-crisis peak by 2013. More worrying is the trajectory of net fixed capital formation, which decreased from 12 percent of GDP in 1950 to 8 percent in 2007, then fell to only 4 percent in 2014. Average depreciation rates accelerated by about 20 percent during the 1980s as companies invested in shorter-lived assets such as ICT equipment but did not compensate in terms of higher gross investment rates. This amplified the decline in net investment.

## Exhibit 2

### In the United States, declining investment is particularly acute when viewed in net terms

#### Domestic capital formation as share of US GDP



SOURCE: BEA, Federal Reserve Board; McKinsey Global Institute analysis

- **Public investment** in the United States declined from 7 percent of GDP in the 1960s to 4 percent in 2007. After a small increase after the crisis, public investment has been cut further to only 3.4 percent in 2014.
- **Household investment** ranged between 4 and 5 percent of US GDP for decades, then accelerated to more than 6 percent during the peak of the housing bubble from 2004 to 2006. It then collapsed to only 3 percent following the crisis and into 2014, barely up from its 2011 trough of 2.9 percent.
- **Gross business investment** ranged between 11 and 13 percent of US GDP for some six decades, with peaks of 15-16 percent in the late 1970s and early 1980s and during the 1999-2000 bubble. However, it fell to a trough below 10 percent in 2009 following the crisis. As of 2014, it had recovered to 13 percent of GDP, in line with long-run ranges. Net business investment has decreased, however, from an average of 4.8 percent from 1960 to 2000 to only 2.8 percent in 2014. At the same time, US companies have enjoyed a period of sharply increased profitability. But they have increased savings rather than investment. In fact, US businesses have transformed into net savers rather than seekers of credit since 2009 (a situation that also held true in 2002-2005). This propensity to save alone suggests that attempts to ramp up business investment via financial means are bound to fail.

#### 1.2. There are a number of secular reasons for declining investment, and weak growth stands out among them

By far the most important determinant of investment seems to be growth—both population growth and per capita GDP growth. Households invest in new housing as populations increase and their income rises. The public sector builds new schools to accommodate more pupils and builds transportation infrastructure to address increasing traffic as the economy grows. Businesses expand their productive capacity to capitalize on rising demand. The multiple of fixed capital and durable goods consumption in the United States, for instance,

has remained in a range of 2.9 to 3.7 from the 1950s until today. At 3.4 in 2014, it is currently above the long-run average.

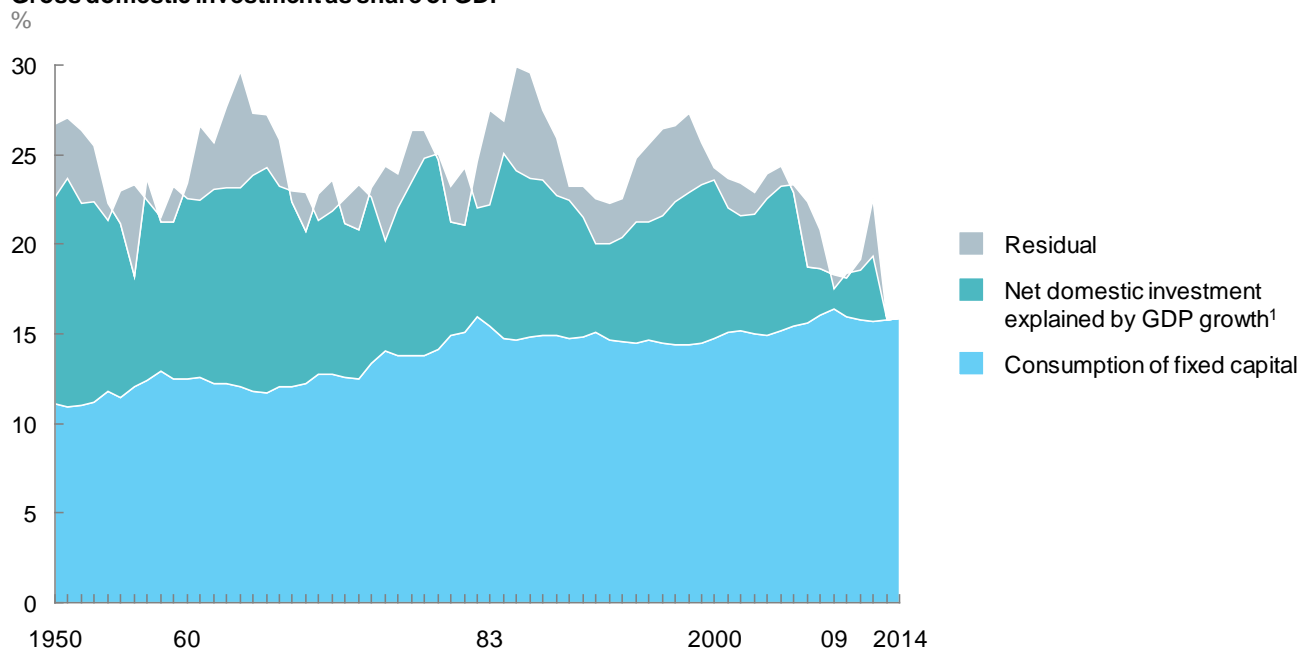
Declining investment rates are, hence, first and foremost a reflection of lackluster growth rates in advanced economies. In fact, US GDP growth rates have declined from an average of more than 4 percent in the 1950s and 1960s to less than 2 percent since 2000.

We created a simple model that tries to explain investment via depreciation of existing capital stock as well as the net investment needed to sustain capital-to-GDP multiples in light of current, immediate past, and immediate future growth. With that model, we were able to explain 85 percent of annual investment between 1950 and 2014 (Exhibit 3). While the model is simple and the link between growth and investment obviously goes both ways, the findings are consistent with a growing body of literature questioning the link between financing and investment and suggesting that the macroeconomic outlook, demand, and profits are the primary determinants.<sup>2</sup>

### Exhibit 3

#### Slow growth and higher depreciation rates, rather than regulation or access to financing, are the main drivers of low net investment in the United States

##### Gross domestic investment as share of GDP



1 Two past years, the current year, and the next two years of GDP growth.

SOURCE: BEA; Federal Reserve Board; McKinsey Global Institute analysis

A number of other secular factors further mute desired investment, although low interest rates partially compensate for them:

- **Depreciation rates.** Observers tend to look at headline gross investment rates. But net, not gross, savings are more important for the savings-investment balance that determines aggregate demand and interest rates. In the United States, implied

<sup>2</sup> See also, for instance, S.P. Kothari, Jonathan Lewellen, Jerold B. Warner, *The behavior of aggregate corporate investment*, MIT Sloan School of Management, working paper number 5112-14, September 2014; or Ryan Banerjee, Jonathan Kearns, and Marco Lombardi, "(Why) Is investment weak?" *BIS Quarterly Review*, March 2015.

depreciation rates have increased to 4.7 percent in 2014, up from 4.1 percent in 1980, reflecting shorter asset life cycles (of ICT equipment, for instance).

- **Prices.** The prices of capital goods relative to overall price levels have decreased by about 30 percent since the 1980s. Businesses can now spend less to purchase the same volume of equipment as in the past. Rapid price declines have offset volume increases in digital investment.
- **Shifts in industry mix.** Corporate profits are increasingly shifting to asset-light sectors. Among publicly listed firms in Europe and North America, sectors such as ICT, professional services, media, and pharmaceuticals have doubled their share of corporate profits to 31 percent since 2000. These sectors are very R&D-, brand-, and skill-intensive and less reliant on PP&E and invested capital stock. They also tend to have a winner-take-all dynamic, with a few leading firms at the top posting much larger profit margins than median firms.<sup>3</sup>
- **Short-termism.** Quarterly reporting cycles and corporate incentive schemes keep executives focused on short-term results, thus making it harder for corporations to invest for the long term. Corporate governance and broader regulation can make a difference.<sup>4</sup>
- **Increasing risk spreads.** Spreads between more risky investment yields and risk-free interest rates have increased by about 100 bps since the 1980s. At a given risk-free rate, this makes risk capital for investment more expensive.
- **Housing markets.** Aging and slower population growth reduce the demand for housing investment (although smaller household sizes can compensate for this effect). Increases in home prices—mostly driven by restrictions that drive up the price of land for urban housing—reduce the buying power of households for actual housing investment on that land.
- **Public policy shifts.** Because public investment is the most discretionary public spending item, it tends to be cut first during recessions. Many countries took this approach following the global financial crisis, but this was especially true in Europe. Over the longer run, US governments have pulled back on investing in infrastructure, while European governments have cut defense investment.
- **Globalization.** U.S. and European multinationals can now access emerging markets that promise significantly higher growth opportunities than mature domestic markets while offering a lower cost base. Many have shifted some of their investment activities abroad.

### 1.3. Recent events have exacerbated longer-term investment declines

The global financial crisis, the plunge in commodity prices, and the transition of China's economic growth model have combined to dampen investment considerably.

Immediately following the crisis, financial liquidity was short and access to credit dried up. Central bank policy and bank clean-ups have largely resolved that issue, although question marks remain about the state of the banking sector and access to finance for small and medium-sized enterprises in some regions (such as Italy). But continued uncertainty and

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<sup>3</sup> See also *Playing to win: The new global competition for corporate profits*; McKinsey Global Institute, September 2015.

<sup>4</sup> See also *Perspectives on the long term: Building a stronger foundation for tomorrow*, Focusing Capital on the Long Term initiative, March 2015, available for download at <http://www.fclt.org/en/ourthinking/perspectives.html>.

volatility as well as weak demand growth have led businesses to shy away from investment. In addition, the recent collapse of oil and other commodity prices has caused a pullback in the oil and mining sectors—which attracted some \$1.2 trillion in global investment as recently as 2013.

China is actively shifting from investment- and export-led growth to an economic model fueled by domestic demand and innovation.<sup>5</sup> But the transition is not smooth. Declines in share prices and major concerns about the overall economic outlook have amplified the investment implications.

#### **1.4. Low investment harms the global economy in the short term and the long run**

In the immediate term, low investment exacerbates weak aggregate demand and keeps interest rates depressed.

Globally, real interest rates have declined by 450 bps over the past 30 years.<sup>6</sup> In many economies (the Eurozone, Sweden, Switzerland, and Japan), central bank rates have turned negative, and monetary policy is reaching its limits. Debt levels, in turn, continue to rise. Investors such as pension funds and insurance companies lack opportunities to generate the yield they need to fulfill promises made to future retirees.

Europe still faces an output gap of more than 2 percent of GDP. Unemployment remains stubbornly high at 8.9 percent for the EU, 10.3 percent for the Eurozone. As economies try to shore up demand via exports, there is significant volatility in currency exchange rates and renewed talk of competitive devaluations.

In the long run, low investment depletes the capital stock of the global economy. Significant infrastructure gaps not only cause friction for business and citizens facing traffic delays or other issues; they can cause real human harm. The neglect of water infrastructure in Flint, Michigan, resulted in lead poisoning; other consequences have included bridge collapses and road and dam deterioration.

Low business investment slows an economy's ability to expand its productive capacity. A reluctance to invest in new equipment, for example, dampens productivity growth. Already a marked slowdown in productivity growth, particularly in the United States and Europe, has become apparent.

## **2. AGGREGATE DEMAND: THE LINK BETWEEN WEAK INVESTMENT, SLOW GROWTH, LOW INTEREST RATES, AND INEQUALITY**

As shown above, low investment rates in an ultra-low interest rate environment are a consequence of weak GDP growth on the supply side as well as the demand side and high desired savings. One way to increase investment and growth is by enabling more consumption.

There are a number of reasons for slowing GDP growth on the supply side.<sup>7</sup> The most notable is certainly demographics. As growth in the working-age population slows, so does GDP growth. MGI has estimated that this effect might cut global GDP growth rates by 40 percent over the coming 50 years as compared to the levels of the past 50 years, or by 19 percent in per capita terms.<sup>8</sup> Some of the factors that have bolstered employment rates and

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<sup>5</sup> *The China effect on global innovation*; McKinsey Global Institute, October 2015.

<sup>6</sup> See, for example, Lukasz Rachel and Thomas D Smith, *Secular drivers of the global real interest rate*, Bank of England staff working paper number 571, December 2015.

<sup>7</sup> See, for example, Robert J. Gordon, *The rise and fall of American growth: The US standard of living since the Civil War*, Princeton University Press, January 2016.

<sup>8</sup> *Global growth: Can productivity save the day in an aging world?* McKinsey Global Institute, January 2015.

productivity are arguably reaching saturation, such as female participation rates, educational attainment, or urbanization. While there is still much potential on each of these dimensions globally, this is less true for younger cohorts in Europe and the United States.

On the demand side, there has been structural weakness and a surplus in desired or ex-ante savings over desired investment for decades.

One reason that deserves more detailed investigation and quantification is rising inequality.<sup>9</sup> High-income households tend to accumulate savings rather than consuming or investing. In the United States, the income share of the top 10 percent of earners increased from 35 percent in 1980 to 50 percent in 2014. And in fact, the expenditure share of after-tax earnings for the top quintile decreased from 84 percent in 1983 to 63 percent in 2012, before increasing again to 75 percent in 2014 following the expiration of tax exemptions, according to the Consumer Expenditure Survey by the US Bureau of Labor Statistics. This dual effect depressed consumption in a structural way, as more income flowed to the strata of the population who directed ever less of it toward consumption.

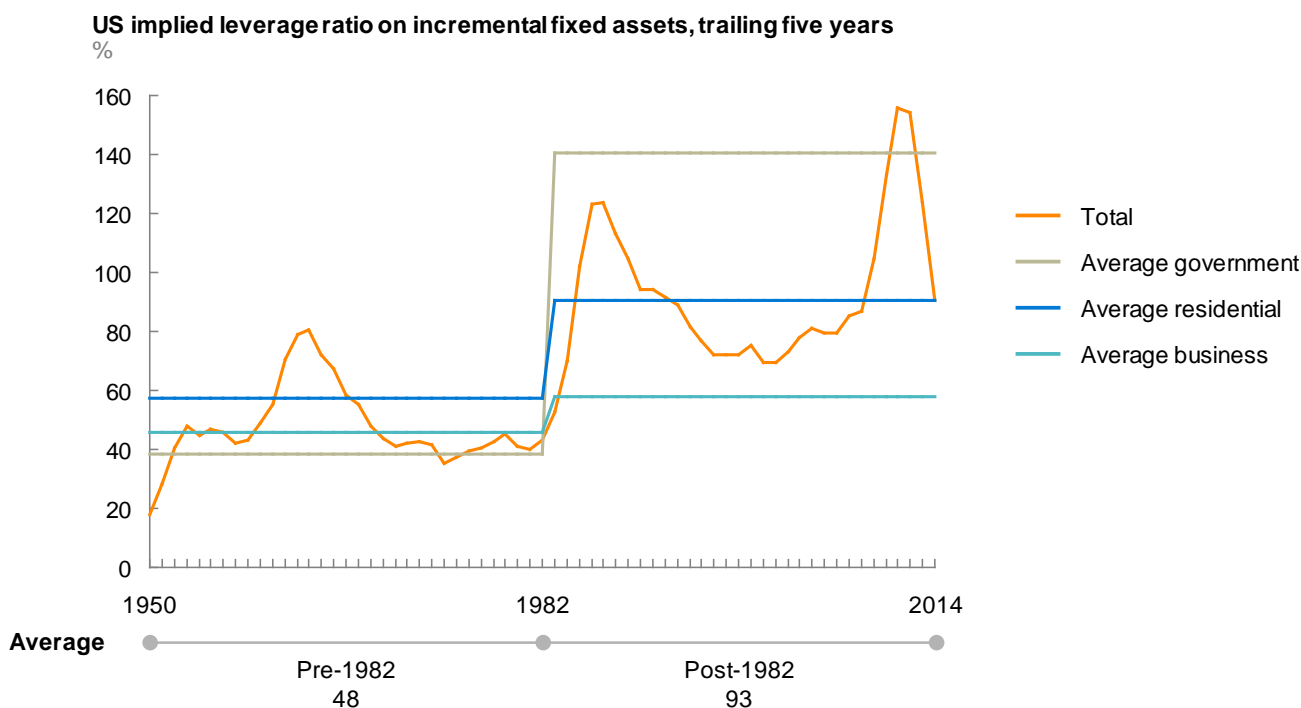
Savings by this income group began to be recycled into the housing debt of lower-income groups. As the highest-income groups saved more but did not invest in line with those savings, they accumulated financial assets. The mirror image of those assets is the debt held by lower-income groups, mostly for housing; this segment invested more than they saved and made up for the shortfall in demand from top income groups encouraged by ever-declining interest rates. As a result, the top income quintile holds 53 percent of net worth but only 46 percent of debt, while the second income quintile holds 18 percent of net worth but 24 percent of debt. The second income quintile in effect borrows from the first. For the lower three income quintiles, the share of total debt equals the share of total net worth. For net worth distributions, the picture is clearer still: In 2011, the highest-net-worth quintile held 84 percent of net worth but only 32 percent of debt.

Increased borrowing for housing is also starkly reflected in implied leverage ratios on new housing capital stock. After averaging 57 percent for decades, residential leverage ratios have averaged 91 percent since the early 1980s (Exhibit 4).

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<sup>9</sup> See also Thomas Piketty, *Capital in the twenty-first century*, Belknap Press, April 2015.

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**Exhibit 4****Leverage, particularly for residential and public investment, rose to questionable levels after the early 1980s**

SOURCE: BEA; Federal Reserve Board; McKinsey Global Institute analysis

It is also worth remembering the inconvenient truth that debts are assets. There seems to be near-consensus that Europe and the United States have debt levels that are too high—and those levels are still rising. Deleveraging weighs on demand and growth.<sup>10</sup> But debt is mathematically equivalent to (non-equity) financial assets. So too much debt essentially means levels of asset ownership are also too high. Unless we can reduce debt levels relative to GDP by faster GDP growth or higher inflation, reducing debt rates will also mean reducing assets relative to income—another cornerstone of the inequality debate. This could take many different forms, such as incentivizing consumption, investment, wealth transfers, or fiscal rebalancing to increase taxes on assets while decreasing them on income.

### **3. A PUBLIC INVESTMENT OPPORTUNITY: ADDRESSING INFRASTRUCTURE GAPS—AND MAKING INVESTMENT MORE PRODUCTIVE**

There have been many calls on raising public investment, both in response to weak demand since the crisis as well as to address clear shortages. Areas for investment might include education, R&D, urban development, climate protection, or, in light of recent events, also security. We focus here on one area that is ripe for investment: Inadequate infrastructure is a pressing global concern.

Roads, ports, airports, rail, and telecom networks are the conduits of trade and mobility, while power fuels production and clean water underpins the very health of the population. Investment that modernizes and maintains these systems can propel economic growth. Too many countries—emerging and advanced economies alike—have paid insufficient attention to those assets, creating economic inefficiencies and allowing foundational systems to erode. The consequences of postponing investment include congestion, power outages, and lack of access to safe water and roads.

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<sup>10</sup> *Debt and (not much) deleveraging*, McKinsey Global Institute, February 2015.

Today any list of infrastructure priorities also has to include universal, affordable Internet access. But at the end of 2015, 57 percent of the world's population, or four billion people, remained offline. The gaps are obviously most acute in low-income countries, but even in advanced economies, many households and individuals are unable to make full use of the Internet. Many do not have access to broadband or cannot afford it. As the flow of ideas, information, and innovation becomes more central to participating in the global economy, access to digital platforms and communication becomes an urgent issue for spurring economic development in poor countries and addressing inequality everywhere. The reliability, speed, and affordability of the Internet also affects productivity and innovation in the business sector more broadly.

### **3.1. Significant unmet infrastructure needs have been deferred**

In our estimate, the world needs to invest about 3.8 percent of global GDP in infrastructure over the period from 2016 to 2030—or an average of \$3.3 trillion a year—just to support expected economic growth (Exhibit 5).<sup>11</sup> Emerging economies account for some 60 percent of that need. Western Europe will need to invest \$400 billion a year in today's currency and prices, on average, while the United States will require as much as \$700 billion a year.

Despite the clear socioeconomic benefits of building infrastructure, investment rates have actually declined since the global financial crisis in most geographies, most notably in Western Europe. This trend has persisted through an extended period of ultra-low or even negative interest rates, despite the need to boost demand in most economies.

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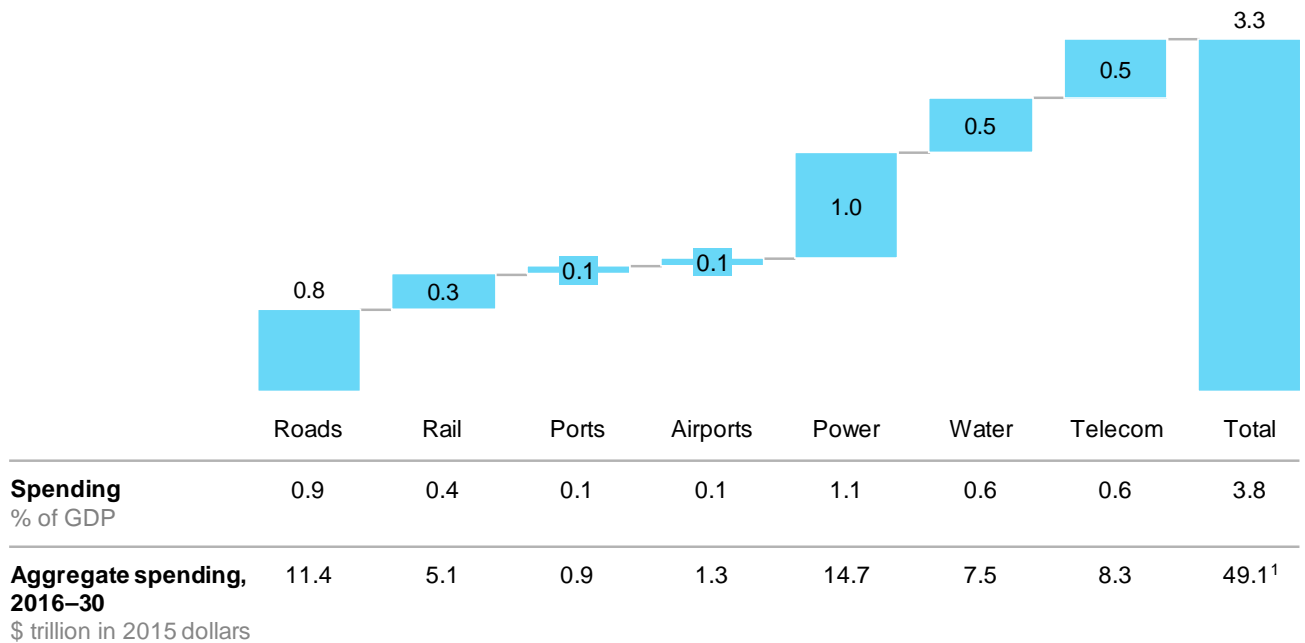
<sup>11</sup> *Bridging global infrastructure gaps*, McKinsey Global Institute, forthcoming.



Exhibit 5

**About \$3.3 trillion investment annually, or 3.8 percent of global GDP, is needed to meet infrastructure needs through 2030**

Average annual spending, 2016–30  
\$ trillion, constant 2015 dollars



<sup>1</sup> This estimate of total demand is lower than the \$57 trillion projection in previous MGI research. It has been adjusted for the following reasons: this projection covers a 15-year period (2016–30) rather than an 18-year period (2013–30); water numbers have reduced by 40 percent, as GWI adjusted its water capex definition by excluding equipment spending; base year prices have been revised from 2010 to 2015; and GDP growth forecasts have been revised downward by IHS.

SOURCE: McKinsey Infrastructure Spend and Stock database; McKinsey Global Institute analysis

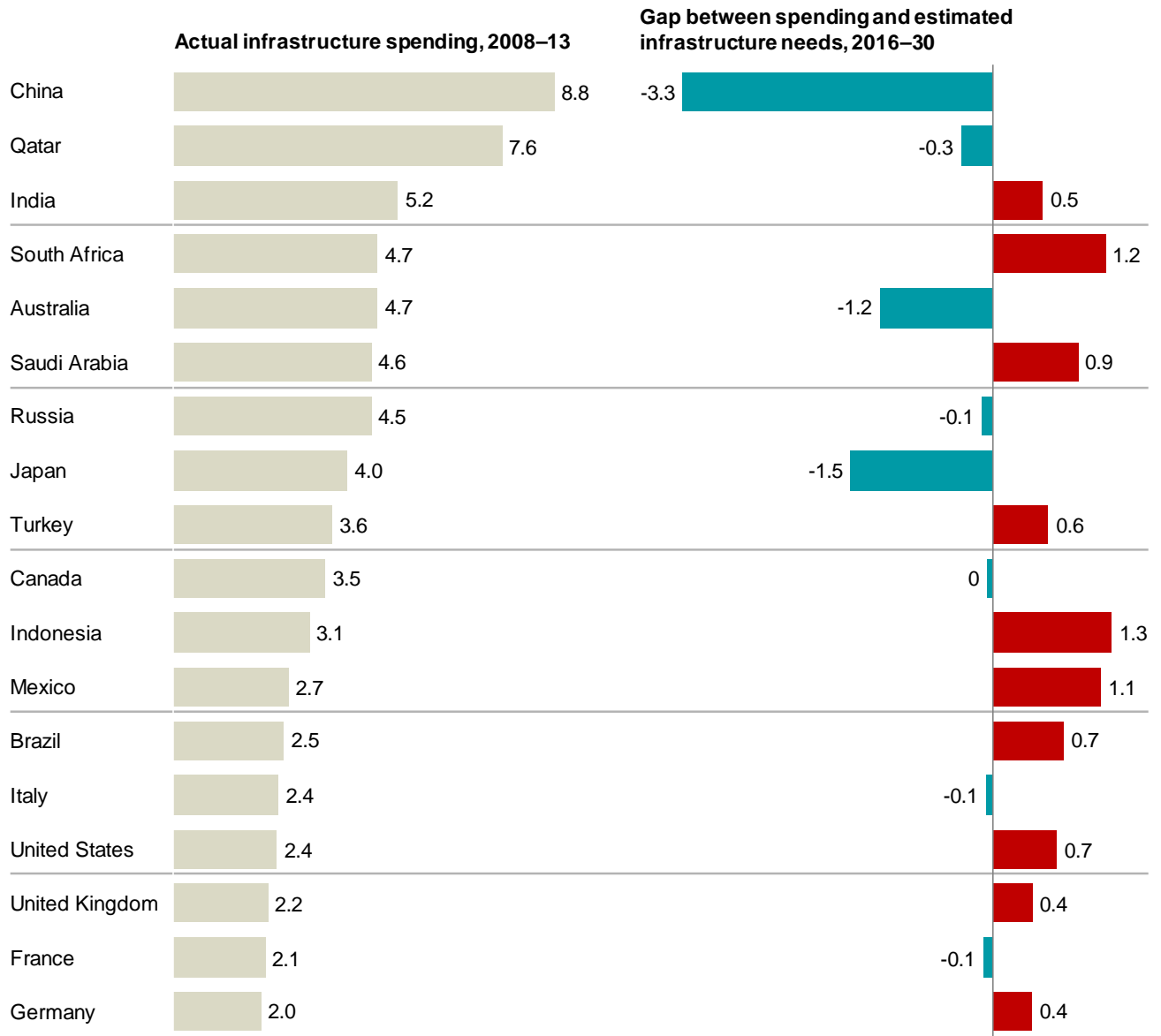
If they maintain their current trajectories, a number of countries will continue to underinvest to such a degree that the world could fall about 11 percent short of the necessary infrastructure investment. The shortfall could amount to some \$350 billion a year (Exhibit 6). This size of the gap roughly triples, however, when we take into account the additional investment required to meet the UN’s new Sustainable Development Goals.

The level of underinvestment greatly varies by country and region. China and Japan, for instance, have already overinvested. By contrast, there are serious gaps in much of Latin America, Southeast Asia, and Africa. In the developed world, the growing deficiencies in the United States and the United Kingdom have also been much discussed. The picture is more diverse in continental Europe: Spain and Portugal, for instance, have already invested more than they need, while Germany has underinvested. Today Germany still has very high-quality infrastructure, but traffic congestion and maintenance gaps in waterways and rail tracks are worrisome signs.

Exhibit 6

The size of the infrastructure investment gap varies widely by geography

% of GDP



Global gap<sup>1</sup> = 0.4% or \$5.2 trillion

1 Global gap for 2016–30 calculated by adding negative values and multiplying up to USD total and then dividing by cumulative world GDP. Without adjusting for positive gap, the value is 0.2 percent. This has been calculated from a set of 49 countries for which data is available for all sectors. This gap does not include additional investments needed to meet the UN Sustainable Development Goals.  
NOTE: Not to scale.

SOURCE: McKinsey Infrastructure Spend and Stock database; McKinsey Global Institute analysis

3.2. Multiple approaches could unlock investment and begin to bridge the infrastructure gap

Public-private partnerships are often discussed as a solution for overcoming the infrastructure gap, and indeed, PPP financing has increased in importance over the years. But there has been a great deal of controversy about whether PPP vehicles deliver higher efficiency or whether they result in higher project costs than traditional public procurement. Black-and-white views do not reflect the more nuanced questions of whether risk transfers are commensurate with capital charges nor whether contracts are appropriately structured to promote efficiency. PPPs tend to be a good choice when there is significant potential for

optimizing revenue streams and costs, such as in airport projects, but they are a questionable choice when they are undertaken largely to circumvent public budgeting rules. Either way, there will be an important role for PPP financing in the future. But such partnerships account for only about 5-10 percent of total investment. They are still dwarfed by public and corporate financing.

Institutional investors and banks have \$120 trillion in assets under management, some of which could be directed into private project finance. This can be an attractive prospect for investors, since returns are often stable over the long term and inflation-protected. Because some 87 percent of those funds originate from advanced economies, while the largest needs are in middle-income economies, solid cross-border investment principles will need to be put in place to unlock this investment. Some of the necessary steps include the following:

- Removing impediments to financing flow, such as recognizing infrastructure as an asset class in regulation such as Basel III or Solvency II, or debt enhancement and investment frameworks more broadly;
- Enhancing market efficiency through measures such as standardization, securitization, index development, and market making by establishing exchanges and placing brownfield assets on them;
- Most importantly, improving the pipeline of bankable projects by focusing on concept development and project preparation vehicles, capability building, the development of national infrastructure plans and pipelines, stakeholder management, and land rights.

Beyond PPPs, corporate finance is actually the much larger contributor to private infrastructure finance, at about three quarters of total private finance. Unleashing investment in privatized sectors primarily requires regulatory certainty and cost-covering prices.

There is substantial scope to increase public infrastructure investment as well. Governments can increase funding streams by raising user charges, capturing property value, or selling existing assets to recycle the proceeds into new infrastructure.

Public accounting standards could be brought in line with corporate accounting so that investments on a balance sheet are depreciated over the lifecycle of the assets rather than booked as one-off expenditures. This change could reduce pro-cyclical public investment behavior.

### **3.3. Beyond ramping up infrastructure financing, there is even bigger potential in making spending more efficient and effective**

A 2013 MGI research report showed that it is possible to achieve savings of some 40 percent on infrastructure projects by making project selection, delivery, and the management of existing assets more effective.<sup>12</sup>

Since then, we have conducted a diagnostic in 12 countries and found common priorities such as building capabilities in the public sector. Our work shows that even the most advanced economies have significant room to learn. Some countries have yet to adopt the best practices that have been successful for their neighbors (Exhibit 7). Capturing these efficiencies requires a detailed understanding of the entire process: infrastructure strategies and master plans; concept development and engineering; execution and contract

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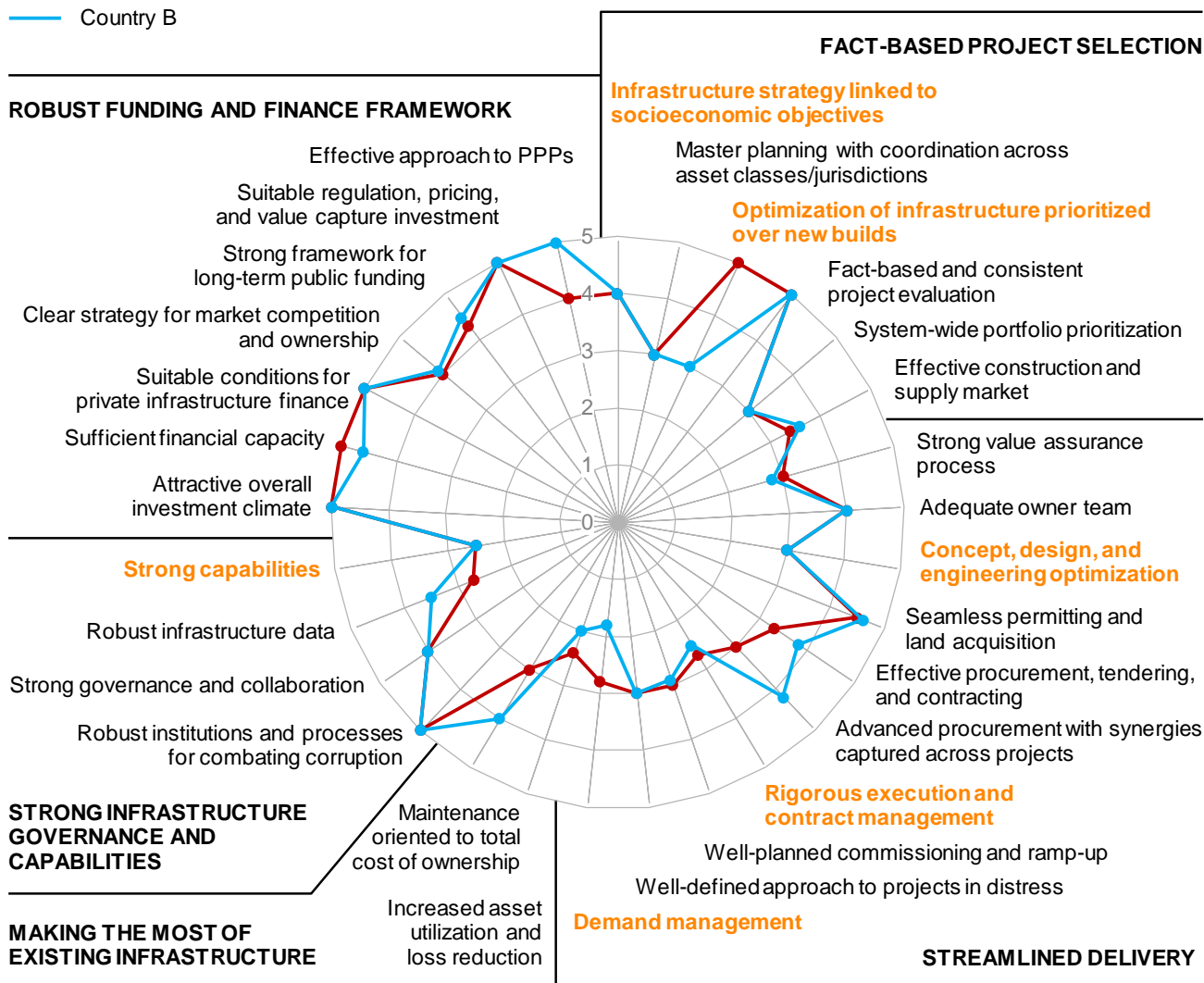
<sup>12</sup> *Infrastructure productivity: How to save \$1 trillion a year*, McKinsey Global Institute, January 2013.

management; demand management, capabilities, and governance; and funding, budgeting, and finance frameworks. Only then can tangible, well-targeted interventions be implemented.

Exhibit 7

**Capabilities, governance, demand management, execution, concept development, and portfolio management are key gaps in infrastructure**

— Country A  
— Country B



SOURCE: McKinsey Infrastructure Diagnostic™; McKinsey Global Institute analysis

**4. A BUSINESS INVESTMENT OPPORTUNITY: DIGITIZATION TO STIMULATE INNOVATION, PRODUCTIVITY, AND COMPETITIVENESS**

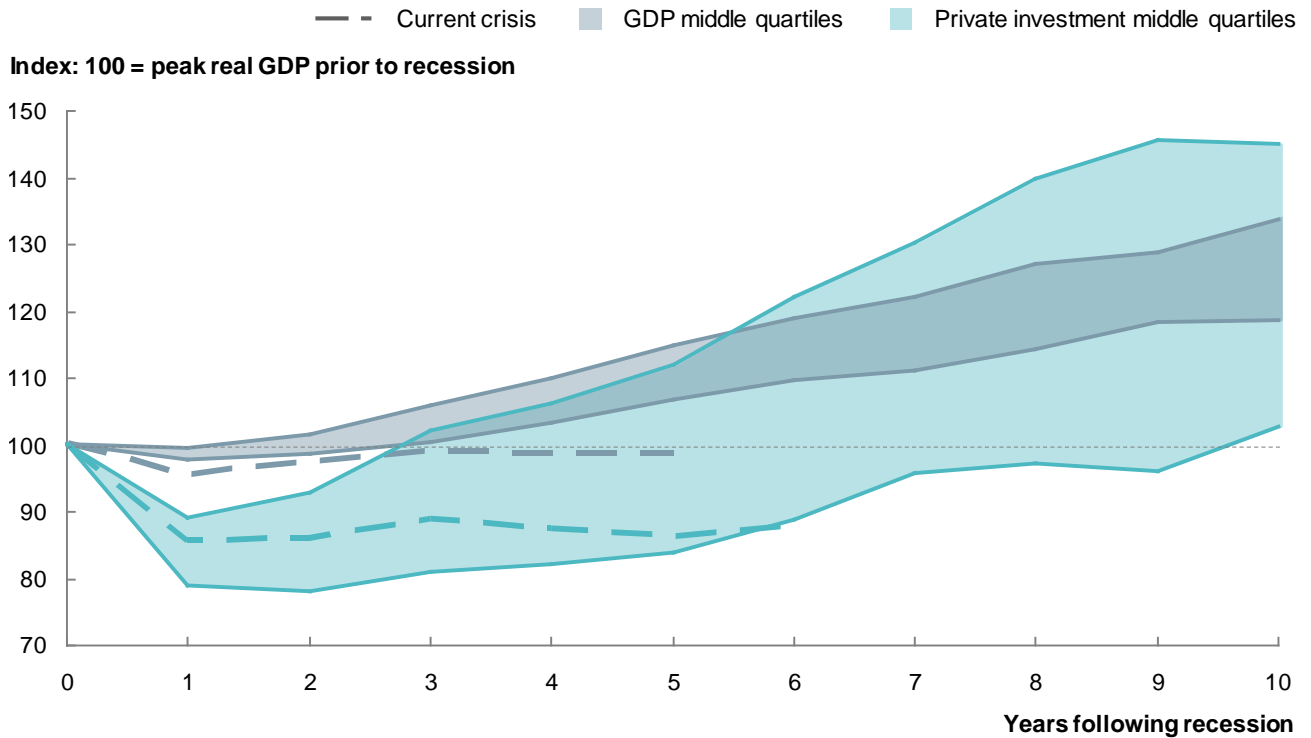
Corporations have historically made up the bulk of investment in advanced economies. But business investment plummeted following the crisis—and, as in past episodes, it has been slow to regain momentum. According to our research, corporate investment almost always follows the recovery and almost never leads it (Exhibit 8).<sup>13</sup>

<sup>13</sup> *Investing in growth: Europe's next challenge*, McKinsey Global Institute, December 2012.

## Exhibit 8

### The recovery of private investment typically lags recovery in the overall economy

Private investment and GDP indexed to 100 in the year prior to each recession identified<sup>1</sup>



<sup>1</sup> Episodes in which private investment fell at least 10 percent from GDP peak to GDP trough, excluding 17 episodes when private investment fell by less than 10 percent. All values in year zero are equal to 100 since private investment is indexed to 100 in that year.  
NOTE: Data for 2014 not yet available for real GDP.

SOURCE: McKinsey Global Institute analysis

There are many reasons for weak business investment and many avenues to address it. Here, however, we focus on just one: the digital investment opportunity. Competitiveness in many industries is increasingly determined by digitization rather than investment in physical assets, and the most digitized companies and sectors are capturing outsized returns that limit their need for external financing.

Digital innovation continues to move at a super-charged pace. But economies are digitizing unevenly, and the entire process is still in its early stages. In fact, recent MGI research has estimated the US economy, one of the most highly digitized in the world, is still only capturing some 18 percent of its digital potential. Accelerating this process could boost productivity, growth, and innovation while unlocking immense consumer surplus and societal benefits.<sup>14</sup>

As this transformation unfolds, it becomes clear that some sectors and companies are far out in front, while large parts of the economy are lagging behind. The MGI Industry Digitization Index shows the disparities between various sectors in the United States—gaps that are also apparent in other economies (Exhibit 9). Some leading retailers and the financial sector were among the first movers, and today the tech sector, media, and professional services are leading the rest of the economy.

<sup>14</sup> *Digital America: A tale of the haves and have-mores*, McKinsey Global Institute, December 2015.

Exhibit 9

Digitization is happening unevenly, as a comparison of US industries shows

Relatively low digitization  Relatively high digitization

2015 or latest available data

● Digital leaders within relatively undigitized sectors

| Sector                         | Over-all digitization <sup>1</sup> | Assets           |                     | Usage        |              |                    | Labor         |                             |                           | GDP share % | Employment share % | Productivity growth, 2005–14 <sup>2</sup> |
|--------------------------------|------------------------------------|------------------|---------------------|--------------|--------------|--------------------|---------------|-----------------------------|---------------------------|-------------|--------------------|---|
|                                |                                    | Digital spending | Digital asset stock | Transactions | Interactions | Business processes | Market making | Digital spending on workers | Digital capital deepening |             |                    |   |
| ICT                            |                                    |                  |                     |              |              |                    |               |                             |                           | 5           | 3                  | 4.6                                       |
| Media                          |                                    | 1                |                     |              |              |                    |               |                             |                           | 2           | 1                  | 3.6                                       |
| Professional services          |                                    |                  |                     |              |              |                    |               |                             |                           | 9           | 6                  | 0.3                                       |
| Finance and insurance          |                                    |                  |                     |              |              |                    |               |                             |                           | 8           | 4                  | 1.6                                       |
| Wholesale trade                |                                    |                  |                     |              | 4            |                    |               |                             |                           | 5           | 4                  | 0.2                                       |
| Advanced manufacturing         |                                    |                  |                     |              |              |                    |               |                             |                           | 3           | 2                  | 2.6                                       |
| Oil and gas                    |                                    | 2                |                     |              |              |                    |               |                             |                           | 2           | 0.1                | 2.9                                       |
| Utilities                      |                                    |                  |                     |              |              |                    |               |                             |                           | 2           | 0.4                | 1.3                                       |
| Chemicals and pharmaceuticals  |                                    |                  |                     |              |              |                    |               |                             |                           | 2           | 1                  | 1.8                                       |
| Basic goods manufacturing      |                                    |                  |                     |              |              |                    |               |                             |                           | 5           | 5                  | 1.2                                       |
| Mining                         |                                    |                  |                     |              |              |                    |               |                             |                           | 1           | 0.4                | 0.5                                       |
| Real estate                    | ●                                  |                  |                     |              |              |                    |               |                             |                           | 5           | 1                  | 2.3                                       |
| Transportation and warehousing | ●                                  |                  |                     |              |              |                    |               |                             |                           | 3           | 3                  | 1.4                                       |
| Education                      | ●                                  |                  |                     | 3            |              |                    |               |                             | 5                         | 2           | 2                  | -0.5                                      |
| Retail trade                   | ●                                  |                  |                     |              |              |                    |               |                             |                           | 5           | 11                 | -1.1                                      |
| Entertainment and recreation   |                                    |                  |                     |              |              |                    |               |                             |                           | 1           | 1                  | 0.9                                       |
| Personal and local services    |                                    |                  |                     |              |              |                    |               |                             |                           | 6           | 11                 | 0.5                                       |
| Government                     | ●                                  |                  |                     |              |              |                    |               |                             |                           | 16          | 15                 | 0.2                                       |
| Health care                    |                                    | 6                |                     |              |              |                    |               |                             |                           | 10          | 13                 | -0.1                                      |
| Hospitality                    | ●                                  |                  |                     |              |              |                    |               |                             |                           | 4           | 8                  | -0.9                                      |
| Construction                   |                                    |                  |                     |              |              |                    |               |                             |                           | 3           | 5                  | -1.4                                      |
| Agriculture and hunting        |                                    |                  |                     |              |              |                    |               |                             |                           | 1           | 1                  | -0.9                                      |

- 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); see technical appendix for full list of metrics and explanation of methodology.  
 2 Compound annual growth rate.

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

But some of the large sectors that are currently lagging could be poised for rapid growth. Companies in manufacturing, energy, and other heavy industries are now in the early stages of digitizing their extensive physical assets. Bolder investment could bring us closer to the era of connected cars, smart buildings, intelligent oil fields, and fully wired factory floors and warehouses.

For companies—and eventually entire industries—to move the needle on productivity, it will not be enough to think of this transformation simply in terms of purchasing the next generation of ICT systems. Just as public infrastructure investment needs a greater focus on capital productivity, so does corporate investment. Purchases of new digital systems and tools will not yield the expected returns unless companies undertake real organizational and process changes to put them to deeper and more effective business use. The leading sectors have created truly digital workplaces over the 15 years we studied. Industries such as construction, leisure, and hospitality tend to rank lower in usage; many businesses have been slow to adopt even some basics like digital payments. Labor-intensive industries such as health care may have incredibly sophisticated technology in some functions but substantial parts of their large workforces use only rudimentary systems or none at all.

The sector-level gaps in digital capability illustrated above are also evident between individual companies, often in the same industry. A recent McKinsey survey of 150 large companies evaluated respondents on 18 practices related to digital strategy, capabilities, and culture to arrive at a metric called the Digital Quotient—and the distribution curve illustrates the striking gap between the digital leaders and laggards (Exhibit 10).<sup>15</sup> The majority of businesses are struggling to keep up with the leaders, and they have a long way to go to capture the full potential of what technology can do in their operations.

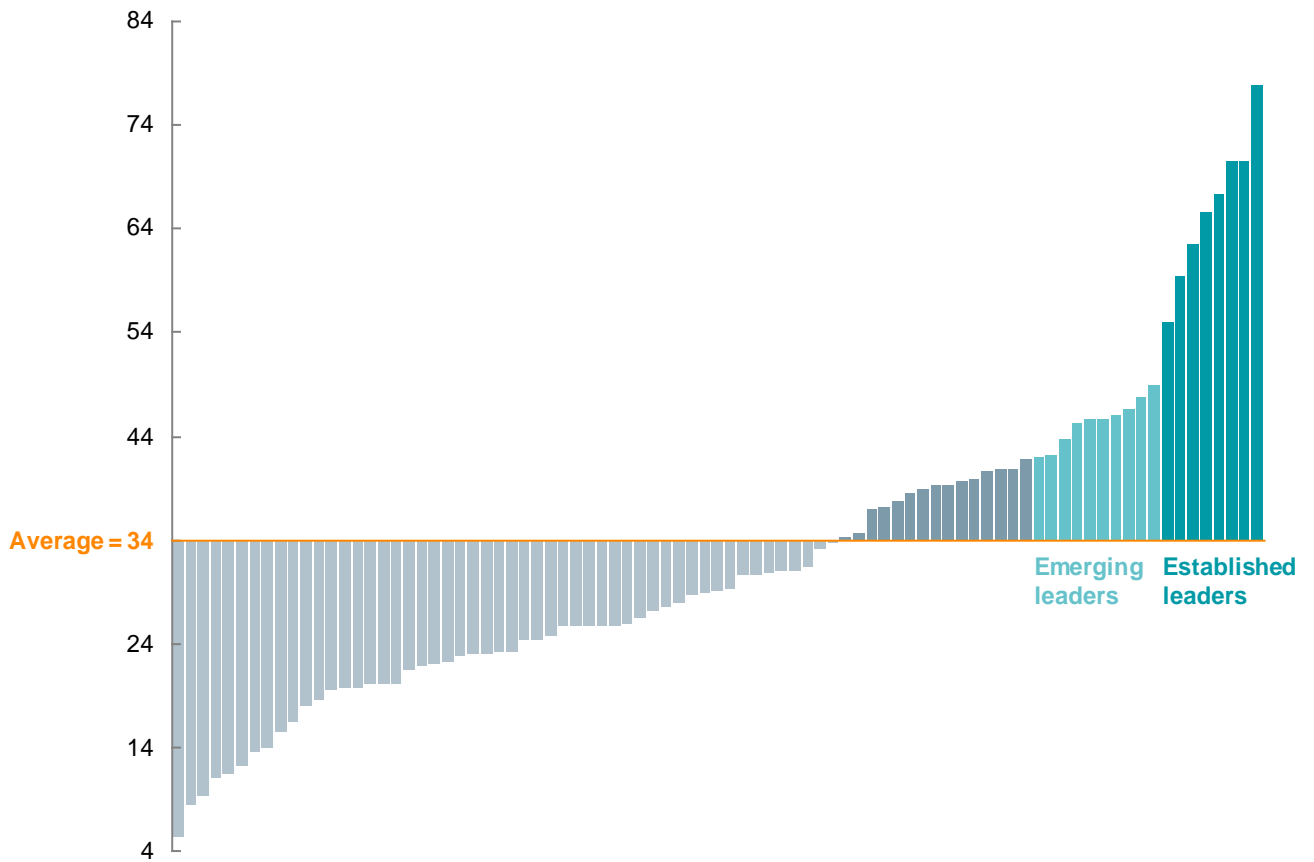
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<sup>15</sup> Tanguy Catlin, Jay Scanlan, and Paul Willmott, “Raising your Digital Quotient,” *The McKinsey Quarterly*, June 2015.

Exhibit 10

Among large corporations, digital maturity varies widely—with a large gap between digital leaders and the rest

Digital Quotient score



SOURCE: 2014–15 McKinsey Digital Quotient company survey; “Raising your Digital Quotient,” *McKinsey Quarterly*, June 2015

There is a wide gulf separating the digital “haves” and “have-mores.” Most sectors of the US economy, for instance, are less than 15 percent as digitized as the leading sectors. Despite a rush of digital adoption, this gap has barely changed in the past decade (Exhibit 11). In fact, the gap has even widened in some areas, as firms and sectors on the frontier shift their focus from acquiring digital assets to digitizing their workforces.

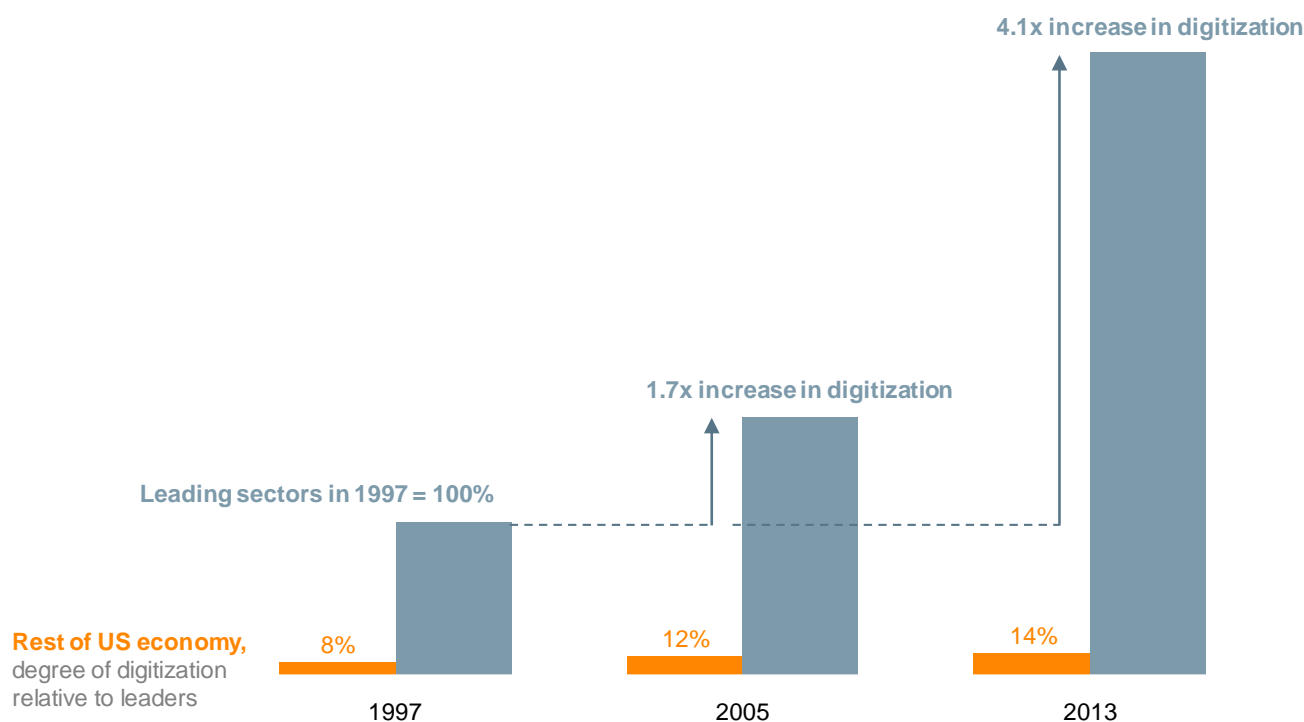


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Exhibit 11

**The most digitized sectors maintain a considerable lead over the rest of the US economy**

Degree of digitization, combining metrics for digital assets, usage, and labor<sup>1</sup>



<sup>1</sup> Using a set of 18 historical metrics spanning digitization of assets, usage, and labor.

SOURCE: BLS; BEA; Gartner; ARP Research; DMA; eMarketer; McKinsey social-technology surveys in 2007 and 2014; McKinsey Global Institute analysis

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The digital leaders are capturing disproportionate benefits—a trend that could incentivize investment. In the past two decades, the most digitized industries in the United States, for example, have seen their profit margins grow two to three times faster than the average and productivity grow four times faster. These industries also have larger margin spreads, indicating a winner-take-all dynamic and a high-risk, high-reward environment. No company can afford to stand still while industries transform around it.

The same kind of dynamic holds true not just for individual companies, but also for entire sectors and national economies. The digital disparities that MGI has found in the United States are increasingly apparent globally.

Much of Europe has built impressive digital infrastructure. In fact, the United Kingdom leads the United States in terms of digital capital stock, both tangible and intangible.<sup>16</sup> A few European nations, most notably the Netherlands, have positioned themselves as major hubs for digital cross-border flows.<sup>17</sup> Highly successful digital native European firms such as Spotify and Skype have expanded globally; others, such as Rocket Internet, have replicated successful digital business models found in other global markets. Many European firms are active in fast-growing areas—for example, capturing 20-30 percent of revenue in big data and Internet of Things applications among the top 20 largest native firms. The prospect of a

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<sup>16</sup> Jacques Bughin and James Manyika, “Measuring the full impact of digital capital,” *The McKinsey Quarterly*, July 2013.

<sup>17</sup> *Digital globalization: The new era of global flows*, McKinsey Global Institute, March 2016.

Digital Single Market in Europe could provide further impetus for the development of large-scale digital platforms.

Nevertheless, Europe as a whole continues to have a large “tech gap” with the United States. Despite its extensive digital infrastructure and thriving digital hubs in London, Stockholm, Berlin, Paris, and Amsterdam, Europe does not currently rival the United States as a producer of global content, a creator of major platforms, or an incubator of successful Internet companies. The proliferation of digital “unicorns”—that is, digital startups with billion-dollar market caps—has not occurred in Europe as it has in the United States.<sup>18</sup> The gap is not only in the number of billion-dollar companies, however. It is visible in measures of investment, which will determine the shape of the digital landscape for years to come. Private-sector tech R&D is a significant contributor to the R&D investment gap between the United States and Europe; this gap persists even in later stages of the R&D commercialization pipeline. As a share of GDP, venture capital and growth investments are nearly four times higher in the United States than in Sweden and ten times higher than in Germany.

As we enter a world of “fintech,” autonomous cars, robots, artificial intelligence, and 3D printing, companies will need to invest in digitizing and modernizing their operations to remain competitive. As more of them move into the digital frontier, the innovative capacity of the global economy could receive a tremendous boost. It will be critical for European companies to make the investments necessary to stake out a role in the new ecosystems and value chains that are rapidly taking shape. The opportunity cost of deferring investment and transformation is growing.

## 5. RESIDENTIAL INVESTMENT: TACKLING HOUSING SUPPLY CONSTRAINTS

Residential investment has followed a pronounced boom-bust cycle in the run-up to and aftermath of the Great Recession. But the build-up of excess housing stock in certain regions (such as coastal Spain) should not distract from the fact that there is ample unmet need and demand for housing in major urban areas and centers of employment. Removing the bottlenecks to supply in those cities could contribute to reviving housing investment.

As our research shows, 330 million households globally today cannot afford decent urban housing, and another 100 million will be added to their ranks over the next decade.<sup>19</sup> The financial gap between what people can afford and the cost of decent housing is \$650 billion a year (\$80 billion in the United States and Canada, and \$60 billion in Western Europe).

A large share of the gap is concentrated just in few cities. Five US cities alone (New York, San Francisco, Los Angeles, Miami, and Boston) account for 85 percent of the gap. In Europe, the picture is similar. London accounts for close to 90 percent of the gap in the United Kingdom, and Paris accounts for 90 percent in France, while Milan and Rome combine to create 70 percent of the gap in Italy.

Constraints on the supply of land and costly, fragmented development are major factors behind the shortage of affordable housing. The price of land price is around 50 percent of total unit costs in New York and nearly 80 percent in San Francisco, even in non-central locations. At the same time, floor area ratios remain comparatively low in some boroughs of New York, and 10 percent of residentially zoned land remains idle. In London, population density is only a third of that in Barcelona. Unlocking land will be crucial to increasing housing

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<sup>18</sup> The measure of success applied here the number of so-called “unicorns” per city population as well as their share of total companies funded by early seed capital. Interestingly, Stockholm performs very well on the former metric, while London does well on the latter. But on average, European cities deliver less than 2 percent of unicorns per vested companies versus more than 5 percent in US cities such as San Francisco, Boston, and Los Angeles. “A digital reboot for Europe,” presentation by Jacques Bughin to DigitalEurope, April 5, 2016.

<sup>19</sup> *A blueprint for addressing the global affordable housing challenge*, McKinsey Global Institute, October 2014.

stock in those locations where it is needed while containing price increases as low interest rates fuel demand.

Deploying an industrial approach for development can further support this goal. Modular high-rise construction (like New York City's B2 project) will require further innovation and perfection before becoming fully commercially viable. Finding areas for large-scale mid-rise redevelopment and deploying value engineering, prefabrication, and lean construction are already proving to be an attractive combination today. These approaches have helped to cut costs by 30 percent and shorten delivery times by 40 to 50 percent.

## 6. WILL REVIVING INVESTMENT REQUIRE FUNDAMENTAL POLICY SHIFTS? A TENTATIVE RESEARCH AGENDA

In the short term, the world still needs to work through the lingering aftermath of the financial crisis. In the longer term, however, all of the secular trends we describe above may persist unless there is decisive policy action to break this cycle. Other research similarly expects sustained investment weakness and long-term low real interest rates.<sup>20</sup>

Ever-lower interest rates and increasing financial liquidity can hardly remain the "only game in town." Lackluster investment by businesses, households, and government does not seem strongly related to access to financing (although some regions are exceptions, and new companies may have greater difficulty in obtaining venture capital and growth capital). Moreover, economic policy needs to address the root causes of weak investment by the public, business, and residential sectors alike, as well as overall gaps in aggregate demand and household consumption. Some of most pressing issues are raised below:

- **Public investment.** Are high deficit and debt levels really a constraint to productive investment—and should they be? What role do budgeting and accounting rules play? How can governments respond to citizens' desire for more public investment, and should they frame national debates in terms of trade-offs?<sup>21</sup>
- **Residential investment.** Are lingering unsold housing stock and high debt levels after the bubble the key reasons for weak housing investment? What role do land market constraints in fast-growing urban areas play? What are the institutional barriers and vested interests that would have to be overcome to resolve those issues? Are low interest rates stimulating investment or pushing up land prices?
- **Business investment.** Is business investment responsive to interest rates? Many executives tell us that they do not even adjust their hurdle rates accordingly. In section 1 of this paper, we laid out a number of secular reasons for the investment decline: depreciation rates, declining prices, industry mix, short-termism, globalization, and risk spreads among them. But what quantitative and relative role does each of these factors play? Would it be more effective to focus on stabilizing aggregate demand? What role could technological disruption and digitization play in reviving investment, and what barriers would need to be addressed?
- **Aggregate demand and residential consumption.** While classic economics literature suggests that ultra-low interest rates should lower the propensity to save and spur demand and consumption, might they actually exacerbate the situation? Could it be that households facing low or negative interest rates actually *increase* rather than decrease their savings rates as they try to meet their retirement goals? Might rising asset prices

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<sup>20</sup> Lukasz Rachel and Thomas D Smith, *Secular drivers of the global real interest rate*, Bank of England staff working paper number 571, December 2015.

<sup>21</sup> See *A window of opportunity for Europe*, McKinsey Global Institute, June 2015, for a survey and conjoint analysis on the aspirations of European citizens and the trade-offs they would be willing to make.

amplify wealth concentration and weaken demand (since higher-wealth and higher-income households have a lower propensity to consume)?

More research will clearly be needed to shed light on these underlying issues, which in turn raise rather fundamental follow-on questions about the direction of economic policy (Exhibit 12):

Exhibit 12

**It may take drastic policy shifts to address structurally weak demand**

|                          | Current situation  | Potential changes to be discussed   |
|--------------------------|--|---|
| <b>Monetary policy</b>   | Near-zero rates and QE amplify issues such as inequality and create financial bubbles yet cannot fully resolve demand gaps   | <ul style="list-style-type: none"> <li>▪ Consider normalizing rates and stabilizing demand by issuing central bank money to citizens ("helicopter money") or by undertaking monetary financing of public investment?</li> </ul>   |
| <b>Fiscal policy</b>     | Elevated debt levels lead to low public investment and, in some geographies, austerity policies  | <ul style="list-style-type: none"> <li>▪ Increase productive public investment, recognizing that investment does not change the net liability of governments?</li> <li>▪ Re-assess healthy levels of public debt given permanently lower interest rates (but also permanently slower growth)?</li> <li>▪ Revisit appropriate levels of asset vs. income taxation?</li> </ul>  |
| <b>Structural policy</b> | Reform focused on liberalization, sometimes amplifying inequality and further weakening demand, at least in the short term, while supporting long-term productivity growth | <ul style="list-style-type: none"> <li>▪ Reform focused on the supply <i>and</i> demand sides of the economy, with a premium on investment stimulus? Among the options:               <ul style="list-style-type: none"> <li>– Education and R&amp;D investment</li> <li>– Unleashing urban land markets</li> <li>– Inequality reduction</li> <li>– Focusing capital on the long term and reducing spreads</li> </ul> </li> </ul> |

SOURCE: McKinsey Global Institute analysis

- **Monetary policy.** Should leaders of monetary institutions investigate unconventional measures beyond yet more monetary easing—measures that aim at stabilizing demand more directly than interest rates and asset prices? These steps could include actually normalizing rates while stabilizing demand via "helicopter money" (i.e., transferring central bank money directly to citizens) or monetary financing of public investment. Much more research would be needed to test the validity of those concepts. But demand could almost certainly be better supported through strategies other than quantitative easing, and alternative approaches could have fewer distributional consequences. Normalizing interest rates would mitigate the risks of renewed asset bubbles and reduce the existential threats posed to pension funds and life insurers.
- **Fiscal policy.** Can leaders increase productive public investment even in the face of today's fiscal pressures, recognizing that investment does not change the net liability situation of governments and is fully compatible with fiscal consolidation? A change in public accounting standards that recognizes investment as assets on a balance sheet and depreciates them over their lifecycle could be a starting point. Obviously, public agencies charged with choosing, planning, and overseeing projects will need strong, independent institutional oversight to safeguard the effectiveness of public investments. But it should be clear that leaving the next generation with quality education and infrastructure must be a priority. Headline discussions of gross debt and deficit rates typically fail to take the consequences of forgoing such investments into account. More controversially, should policy makers reopen debates about the right level of and means for income and wealth transfer in order to sustain appropriate levels of demand in the economy? The trade-offs involved in such a debate stretch far beyond economics and the scope of this short discussion paper.

- **Structural policy.** Reform purely focused on liberalization—aimed at targets such as reducing labor market regulation, cutting red tape in product markets, privatizing state-owned enterprises, and lowering tax rates—has become orthodoxy since the 1980s. While these strategies continue to be important for long-run growth, might they actually hurt demand and employment in the short term? Would economies need a complementary focus on addressing the factors that have contributed to structurally weak demand, emphasizing education and R&D investment, unleashing urban land markets to enable housing investment, focusing capital on the long term, and reducing spreads, as well as measures to reduce inequality?



The decline in investment is hollowing out the productive capacity of economies around the world and aggravating weak demand. Rather than continuing to bet on monetary measures that cannot resolve these issues in and of themselves, it may be time to raise bolder policy questions and address this issue head on. This will be a topic for continued research by the McKinsey Global Institute, and we welcome reactions and input to this preliminary discussion paper.

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