



# U.S. Investment Heroes of 2015: Why Innovation Drives Investment

BY DR. MICHAEL MANDEL

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## INTRODUCTION

Back in 2012, the Progressive Policy Institute identified the shortfall in business capital spending—or the “investment drought”, we termed it—as one of the major economic problems facing the U.S. economy. As we wrote then, “sustainable economic growth, job creation, and rising real wages require domestic business investment.”<sup>1</sup>

Unfortunately, three years later, the United States is still suffering from an investment drought. Capital per worker-hour has fallen since 2010, meaning that the average American worker has less equipment, buildings, and software to use, exactly the opposite of what we would want. More worrisome, this is not simply a short-run trend. In fact, the 10-year growth rate of productive capital is only 2 percent, by far the lowest in the post-war era (Figure 1).

Leading economists are increasingly concerned that the weakness in domestic investment is making it hard for businesses to boost productivity, measured

by output per hour. The 10-year growth rate of nonfarm business labor productivity is only 1.3 percent, compared to 3 percent as recently as 2005. In a recent speech, Jason Furman, head of the White House Council of Economic Advisors called the decline in productivity growth “an investment-driven slowdown.”<sup>2</sup>

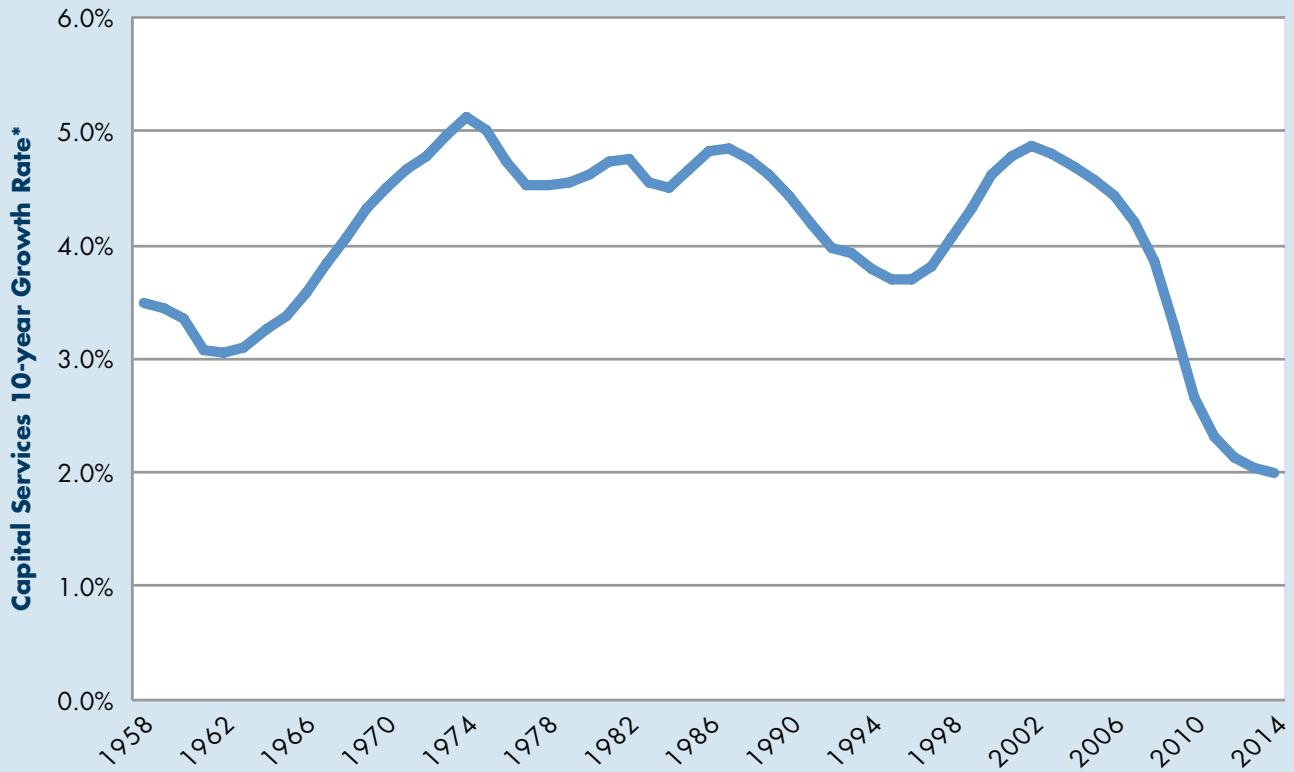
A 2015 report by the OECD on productivity addresses the recent productivity slowdown and the question of whether it is temporary or “a sign of more permanent things to come.” They assert the importance of innovation for achieving growth, writing “productivity is expected to be the main driver of economic growth and well-being over the next 50 years, via investment in innovation and knowledge-based capital.”<sup>3</sup>

Given that productivity gains are the primary force for real wage growth, there is a direct link from weak business investment to slow productivity growth to weak real wage gains. If we want to assure a future of high American living standards, one

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FIGURE 1: CAPITAL GROWTH FALLS TO POST-WAR LOW



\*Nonfarm business sector  
Data: Bureau of Labor Statistics

of the most important things we can do is adopt policies that increase business investment.

**THIS REPORT**

The purpose of this report is two-fold. First, we identify those companies that are bucking the prevailing trend by continuing to invest domestically in buildings, equipment, and software.<sup>4</sup> We call these companies “Investment Heroes” because their capital spending is helping to raise productivity and wages across the economy. Second, we use our “Investment Heroes” analysis to help understand the potential causes of the investment drought, and discuss some policy options for reversing it.

Since 2012, PPI’s Investment Heroes reports have provided, for the first time, an estimate of domestic

capital spending for major U.S. companies. Since current accounting rules do not require companies to report their U.S. capital spending separately, we created a methodology that used published data from nonfinancial Fortune 150 companies to identify the top companies that were investing in the United States. That methodology, with small modifications, has been used in each year’s report since the first in 2012.

To understand which companies are betting on America’s future today, we rank the top 25 companies by their estimated domestic investment in their most recent fiscal year. This year, as in the previous three years, the company at the top of our list is AT&T, which invested \$21.2 billion in the United States in 2014. The next on the list is Verizon, with an

estimated \$16 billion in domestic capital spending, followed by Exxon Mobil, Google, Chevron, and Walmart.

As was the case last year, the top Investment Heroes category was telecom and cable providers, followed by energy production companies, and then technology and Internet companies. These three categories comprised 15 out of the 25 companies on the list, and accounted for 71 percent of the total investment.

In addition, we offer up a summary table of the top 10 companies with the highest levels of domestic capital spending over the past three years. The list highlights those companies that have sustained their investment in America over time. Topping our three-year Investment Heroes list is AT&T, which invested \$61.6 billion in the United States from 2012 to 2014, followed by Verizon, Exxon Mobil, Chevron and Walmart.

We see from this analysis that the top investment heroes, with few exceptions, are found in those industries with a rapid pace of innovation. The rise of wireless and broadband, energy production innovations such as hydraulic fracturing and horizontal drilling, and the mobile app/Internet boom are creating new markets and new investment opportunities. Would energy companies be spending so much money drilling in the U.S. if it wasn't for new production technique that made domestic oil and gas production more profitable? Would the telecom companies be spending so much on expanding old analog wired networks?

Conversely, the broad investment drought may be linked to “uneven innovation”—that is, rapid innovation in some areas is combined with a lack of commercially successful breakthroughs in other areas such as material sciences and healthcare.<sup>5</sup> The weakness in innovation, outside of tech and energy production, leads to a lack of investment, weak productivity growth, and sluggish growth of real wages.

Indeed, past industrial revolutions have been built on multiple major innovations across major categories. For example, the period 1920-1940 saw major advances in transportation (air travel), medicine (antibiotics), materials (plastics and artificial fibers), information processing and communications (radio,

television, computers). Other major innovations in energy (electricity) and transportation (automobiles) diffused to broader populations over the same period.

So uneven innovation may be holding back productivity and wage growth on the macro level. The relatively limited scope of innovation today may help explain the weak economic performance of the developed economies.

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If we want to assure a future of high American living standards, one of the most important things we can do is adopt policies that increase business investment.

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That suggests government policy should be directed towards broadening the scope of innovation, which will generate both more investment and more jobs. In other words, what we need today is “inclusive innovation,” which cuts across more areas of the economy.

The paper concludes with a discussion of the components of a new policy framework for inclusive innovation. One vitally important policy challenge, for example, is getting regulation out of the way of investment and innovation. That's especially true in highly-regulated areas such as healthcare, where layers of rules may discourage investment, and telecom, where the FCC recently added more regulations on broadband providers and potentially undercut the incentives for innovation.

Other policy initiatives designed to foster inclusive innovation and investment include tax reform that closes inefficient and inequitable loopholes, lowers the corporate income tax, and provides incentives for investment in intangibles; increased federal investment in R&D to make up for slowing R&D growth in the private sector; and additional public-private investment in infrastructure, which spurs and enhances the value of private investment.

FIGURE 2: U.S. INVESTMENT HEROES: TOP 25 NONFINANCIAL COMPANIES BY ESTIMATED U.S. CAPITAL EXPENDITURE

Rank	Company	Estimated 2014 U.S. Capital Expenditures (millions of dollars)	Rank	Company	Estimated 2014 U.S. Capital Expenditures (millions of dollars)
1	AT&T	21,199.0	14	American Airlines Group	5,311.0
2	Verizon	16,004.8	15	General Motors	4,924.4
3	Exxon Mobil	12,401.0	16	Amazon.com	4,808.3
4	Google	10,709.7	17	Union Pacific	4,346.0
5	Chevron	10,011.0	18	Freeport McRoRan	4,278.0
6	Walmart	8,238.0	19	Time Warner Cable	4,097.0
7	ConocoPhillips	7,618.0	20	Apple	4,076.8
8	Comcast	7,420.0	21	FedEx	3,912.1
9	Intel	6,535.2	22	Ford Motor	3,767.8
10	Exelon	6,077.0	23	Hess	3,645.0
11	Occidental Petroleum	5,657.0	24	General Electric	3,076.1
12	Energy Transfer Equity	5,381.0	25	Microsoft	3,068.3
13	Duke Energy	5,317.0	<b>Total</b>		<b>171,879.6</b>

Data: Company financial reports, PPI estimates

### U.S. INVESTMENT HEROES: THE LIST

Together, the top 25 investment heroes invested nearly \$172 billion in the United States in their most recent fiscal year. That's up from \$152 billion from last year's top 25, a 12.7 percent increase compared to the 7 percent gain for nonresidential business investment as a whole.

Of the 24 out of 25 companies that appear on both this year's and last year's list, 18 have increased investment over last year, and six have reduced capital spending. The mean gain is 19.1 percent and the median is 11.4 percent.

AT&T is once again at the top of our list, as it has been in all four years we have been tracking domestic business investment. Verizon and Exxon Mobil are also both holding strong, coming in second and third place, respectively, again for their latest fiscal year. Number 4 is Google, with Chevron rounding out the top five.

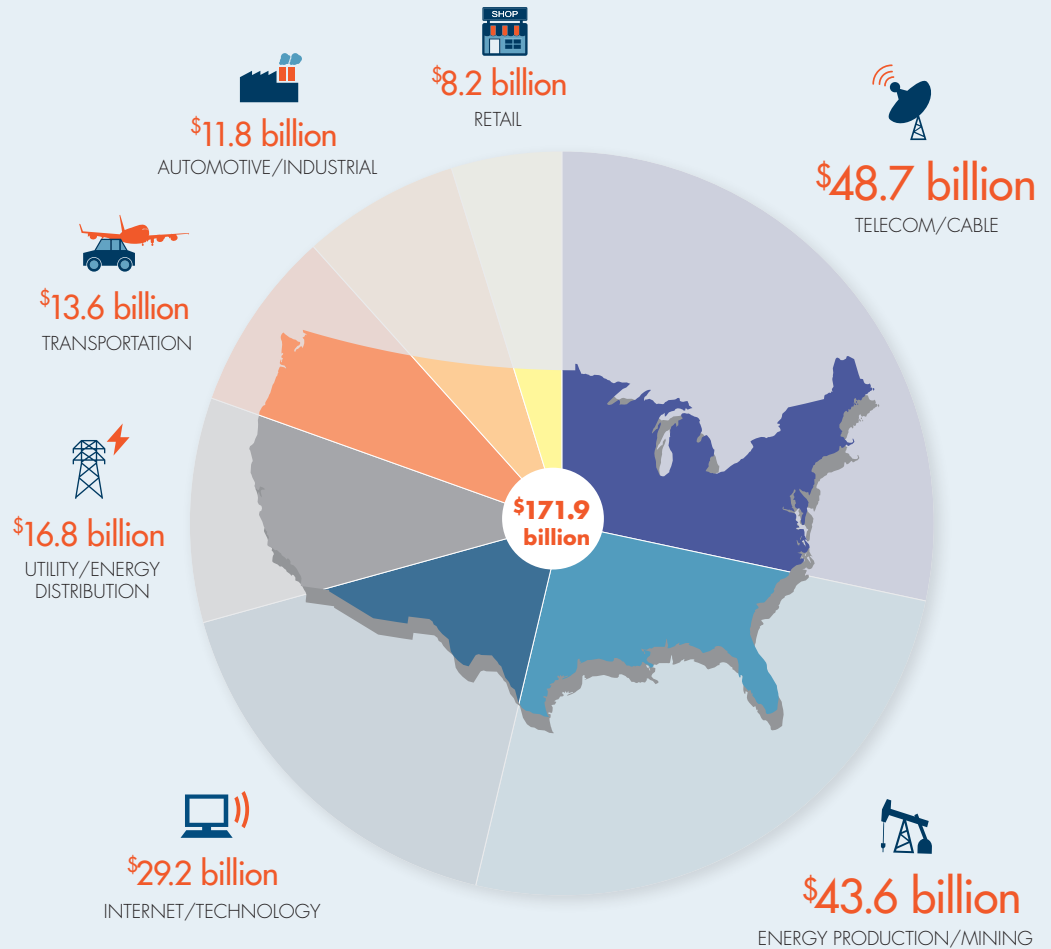
The only new company to the list this year is the American Airlines Group, coming in at 14th with domestic capital expenditures of \$5.3 billion in 2014. This reflects in part the merger with US Airways that took effect on December 9, 2013. The one company from last year's list that didn't make it this year was Enterprise Products Partners, a gas and oil pipeline company, which had a 15 percent decrease in investment this year and fell just short of making the top 25.

In this report, as with the last report, telecom and cable companies represent the largest share of domestic capital expenditure on our list, reflecting the rapid pace of innovation in the industry and the desire to meet growing demand for high-speed broadband. This category contains the same four companies as last year—AT&T, Verizon, Comcast, and Time Warner Cable—with domestic investments up by 5.5 percent in 2014 compared to 2013.

FIGURE 3:

# U.S. Investment Heroes by Sector

Combined, they invested \$171.9 billion in 2014\*



\*Or the most recent fiscal year available.  
Data: Company financial reports, PPI estimates

AT&T and Verizon continued to make significant capital expenditures in 2014 in order to expand and maintain their wireless and wireline networks. Comcast also dedicated a portion of its spending in 2014 to the deployment of its X1 platform (offering IP and cloud-enabled video) and its cloud DVR technology.

The second largest sector on our list, in terms of spending, is the energy production and mining category. These six companies had a total domestic capital expenditure of \$43.6 billion by our estimate, which is an increase of 9 percent from last year.

The investment in this category illustrates the power of innovation to drive investment growth. The new production technologies such as hydraulic fracturing and horizontal drilling opened up new domestic oil and gas fields for exploration and production. In fact, U.S. oil production reached a 30-year high at the very end of 2014 and the high rates of production have continued into this year.<sup>6</sup>

For example, ConocoPhillips' domestic capital expenditures focused on shale exploration across the country, as well as oil and natural gas exploration in the Permian Basin (Texas, New Mexico). They also invested on development in the Greater Kuaruk Area and Greater Prudhoe Area in Alaska. Occidental

Petroleum also invests heavily in domestic oil and gas operations. The company's increase in capital expenditures from 2013 to 2014 is credited to its increased activity in these operations, specifically its exploration in the Permian Basin.

The question is whether the energy companies can maintain this pace of domestic investment given the sharp fall in oil prices since July 2014. So far U.S. producers have continued to explore aggressively, with rig counts increasing even in August.<sup>7</sup> But there are increasing signs of falling investment and lay-offs in the oil industry as global prices continue to decline.

The Internet and technology category places third again this year with a combined investment of \$29.2 billion, up 29 percent from last year. Google more than doubled its domestic capital spending over the year, according to our estimates, and Amazon showed an increase of over 80 percent. Amazon continued to invest domestically in additional capacity to support its fulfillment operations. The company also continued to invest in technology infrastructure, including in its cloud computing platform, Amazon Web Services (AWS), which has its servers primarily based in the United States.

The share of expenditure attributed to utility and energy distribution companies was \$16.8 billion this year, which shows a decrease of five percent relative to last year. However, as noted above, Enterprise Products Partners dropped off the list this year, so only three companies are included rather than four. Comparing only those three companies year to year, we see an increase in investment of 23 percent in the category. Exelon, the leader in this group, spends a large share of its capital investment on maintaining and improving its utility service operations. This includes improving reliability and adding capacity to its transmission and distributions systems. In 2014, Exelon's capital expenditures also included technological improvements involving smart grid/smart meter technology in order to comply with Illinois' Energy Infrastructure Modernization Act (EIMA) of 2011.

The transportation category has moved up two places in ranking from last year's report with a total domestic investment of \$13.6 billion, more than doubling from last year's \$6.7 billion. This dramatic

FIGURE 4: THREE YEAR TOTALS:  
WHICH COMPANIES ARE THE LEADERS?

Company	3-Yr Total Domestic Capital Investment, 2012-2014 (millions of dollars)
1 AT&T	61,608
2 Verizon	46,448
3 Exxon Mobil	35,630
4 Chevron	31,311
5 Walmart	25,147
6 Intel	23,746
7 ConocoPhillips	20,047
8 Comcast	19,730
9 Occidental Petroleum	18,749
10 Exelon	17,261

*Data: Company financial reports, PPI estimates*

increase is due mainly to the American Airlines Group, which debuted on the list this year. However, the other two companies in this group, Union Pacific and FedEx, aided the jump with each increasing their domestic capital expenditures by nearly a quarter this year. The substantial outlays being made by transportation companies are a positive sign of the revival of the global economy.

For example, Union Pacific dedicated sizeable capital expenditures to its rail network for replacement, improvement, and expansion in 2014. The company focused on renewing track infrastructure as well as on upgrading its fleet of locomotives and freight cars, by replacing older, less efficient equipment with new fuel-efficient and low-emission rail cars.

FedEx is also characterized by capital-intensive operations. Its largest capital expenditures in 2014 were for aircraft and related equipment, including taking delivery of 14 Boeing 767Fs and 13 Boeing 757s during this period. Another major component

of expenditure last period was FedEx Ground's expansion of facilities and sort equipment.

As for the automotive and industrial category, things are fairly consistent relative to last year. The same three companies General Motors, Ford and General Electric are on the list, and the total investment for the group is \$11.8 billion, up just 4.6 percent from the previous year. Note that we do not count investment made by the finance arms of these three companies, consistent with omitting financial companies from the list.

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Walmart, the sole member of the retail category on our list, reported total domestic investment of \$8.2 billion in 2014. Walmart has been expanding its digital initiative since 2010 and now operates e-commerce websites in 11 countries. In fact, Walmart's U.S. investment in physical locations (new stores and clubs, expansions, relocations) has actually decreased by almost 20 percent in the past year, while its U.S. investment in digital retail and the supporting systems has increased by nearly 30 percent since last year.

### THREE-YEAR HEROES

This is the fourth year that PPI has put together an Investment Heroes list, using essentially the same methodology. That allows us to assess investment patterns, to see which companies have sustained their high levels of domestic spending, making long-term bets on America.

In addition to our annual list, we put together a list of the top nonfinancial companies who are investing in the U.S, based on cumulative domestic capital expenditures from 2012 to 2014 as reported in our annual lists. The results are shown in Figure 4.

The company with the largest three-year total is AT&T, which has invested \$61.6 billion in the United States

from 2012 to 2014. Verizon follows in second place with a three-year total of \$46.5 billion. Add to this the other telecom and cable company making the top ten three-year period list, Comcast, and we have a total three-year investment of \$128 billion from that category. Following close behind are the energy companies. Five of them make the top ten three-year totals list: Exxon Mobile, Chevron, ConocoPhillips, Occidental Petroleum, and Exelon. Together they have three-year domestic capital expenditures of \$123 billion.

The only two companies outside of these categories to make this top ten list are Walmart and Intel, with three-year investments totals of \$25.1 billion and \$23.7 billion, respectively. Together, the top ten companies invested almost \$300 billion in the United States from 2012 to 2014.

### POSSIBLE CAUSES OF THE INVESTMENT DROUGHT

As the U.S. economy stumbled out of the Great Recession, economists assumed that business investment would recover as demand did. But more than five years into recovery, with interest rates and unemployment low and consumer spending well above pre-recession levels, nonresidential investment is still weak.

Figure 5 and 6 starkly show the problem. Currently nonresidential investment is 21.5 percent below long-term trends. That's the worst performance of any major component of GDP. Indeed, even residential investment is recovering faster than business investment.

So what are the potential causes of the persistent investment drought? In earlier Investment Heroes reports, we pointed to globalization as an important cause of the domestic investment drought. But the latest figures from the Bureau of Economic Analysis (BEA) make that explanation less convincing. From 2009 to 2012, parent companies of U.S. multinationals increased their capital spending at home by 35 percent, slightly **more** than the 32 percent increase in their non-U.S. capital spending.<sup>8</sup>

Instead, the evidence increasingly suggests that the investment weakness is a symptom of what we have recently called "uneven innovation."<sup>9</sup> What do we mean by uneven innovation? Clearly our country is experiencing an unprecedented innovation boom

FIGURE 5: PRIVATE NONRESIDENTIAL INVESTMENT WELL BELOW LONG-TERM TREND



\*Based on 10-year growth rate ending in 2007, extrapolated to current date.  
Data: BEA, PPI

in information technology and more recently in energy production. In these areas we have tangible proof that innovation has created profitable new investment opportunities—in broadband networks, in shale field exploration, in mammoth data centers.

However, outside of these dynamic pockets the overall rate of innovation or technological change is not strong. Multifactor productivity, one way that economists assess the rate of innovation, is growing at only a 0.6 percent annual rate over the past 10 years. That’s the slowest 10-year growth in multifactor productivity since the 1980s—not the best sign of broad technological innovation.

Indeed, in other important areas, such as materials sciences and healthcare, there appears to be a relative

lack of profitable innovation-related investment opportunities being created. This unevenness of innovation is reflected in the noticeable paucity of industrial and healthcare-related companies at the top of the Investment Heroes list.

We all know that investment in domestic manufacturing has been lagging, in part because of global competition. At the same time, we haven’t seen any great breakthroughs in new materials or manufacturing processes that would induce the need for investment, as the introduction of steel and plastic did.

The weakness of private sector investment in the healthcare industry is especially surprising considering the obvious economic importance of healthcare, and its relative immunity from foreign competition. Our main list includes no healthcare-



FIGURE 6. NONRESIDENTIAL INVESTMENT: THE BIGGEST LAGGARD

GDP Components	Shortfall Below Long-term Trend*
Nonresidential investment	-21.5%
Government	-18.7%
Personal consumption	-14.5%
Residential investment	-14.4%
Exports	-10.1%

\*Based on 10-year growth rate ending in 2007, extrapolated to current date.

Data: BEA, PPI

related companies. Our non-energy list (Figure 7) includes two, Johnson & Johnson and HCA Holdings (and CVS, if we want to count a retailer as a healthcare-related company).

The low number of healthcare-related companies on our list is consistent with government data from the BEA. In 2014, the private healthcare sector—including hospitals, ambulatory care, and pharmaceutical companies—invested between \$16,000 and \$19,500 per worker in equipment, buildings, and intellectual property such as software and research and development.<sup>10</sup> That’s roughly comparable to the \$18,900 per worker invested across the entire private sector in nonresidential assets.

By comparison, the tech/info sector—including telecom, content, Internet, software, and computer and communications manufacturing—invested \$68,000 per worker in equipment, buildings, and intellectual property such as software and R&D. Moreover, from 2004 to 2014, real investment per worker grew by 43 percent in the tech/info sector, compared to a 17 percent gain in healthcare and 25 percent increase in nonresidential investment per worker in the entire private sector.

It’s important to be clear about what we are saying here. The public and private sectors have both invested enormous sums in healthcare-related research and development. As a result, there has been rapid progress in medical science. Indeed, the discovery and commercialization of a cure for Hepatitis C show the potential of medical innovation for boosting productivity while improving health.<sup>11</sup>

But a variety of regulatory and fiscal obstacles in the healthcare sector have attenuated the typical link between innovation and investment. In the next section, we’ll explore policy measures for addressing this problem.

## HOW POLICY CAN ENCOURAGE “INCLUSIVE INNOVATION”

In this paper we have presented the 2015 list of Investment Heroes, the companies that invest most heavily in America. However, as we have noted, the overall investment drought continues, holding down productivity growth and dampening real wage gains. Moreover, we have made the case that the investment drought is a symptom of uneven innovation.

So we want to address the question: How can we find a new policy framework to help move us from uneven innovation to inclusive innovation? By “inclusive innovation” we mean innovation that benefits all Americans, not simply the people working in the oil fields or the tech startups. We want innovation across a much wider range of fields and industries than simply information technology, including innovation that benefits manufacturing, construction, healthcare, education, and the public sector.

To begin with, a policy framework for inclusive innovation would favor systemic improvement of the regulatory system, which is increasingly getting in the way of innovation. We have written in the past about the need for a Regulatory Improvement Commission, which would delete or improve obsolete or redundant regulations.<sup>12</sup> Such a commission has been proposed in legislation now before Congress.

In terms of particular industries, the data show that we are surprisingly underinvesting in healthcare physical and intellectual assets, given the rapid increase in healthcare employment. More investment would cost more in the short run, but would boost health care productivity, and in the long run hold down cost increases.

In the telecom industry, pro-investment policy should support “light touch” regulation. Here we have the makings of a natural experiment, since the FCC departed from this approach last February by imposing Title II regulations on

broadband service. So far in the first half of 2015, the telecom companies on our list are spending at an 11 percent slower pace than a year earlier. That might be related to the build-out of their networks. Alternatively, it could be due to higher levels of regulation, which potentially reduces the gains from further investment.

An inclusive innovation policy would also include tax reform that closes inefficient and inequitable loopholes, lowers the corporate income tax, and provides incentives for investment in intangibles. High up on the list is a patent box or innovation box, which is a fancy way of saying that the government imposes a lower tax rate on investments in intellectual property such as patents or copyrights.

Perhaps more important than any specific public policy change is a general change in the way policymakers approach their jobs. They need to give greater emphasis to investment and innovation when making decisions on public spending, regulation and taxation.

More than ever before, policymakers must understand that inclusive innovation benefits all Americans. We can see the lessons of history all around us, since broad-based innovation created some of our great industries like automobiles, airlines, and steel. And these industries in turn, generated more jobs and higher wages. There is no reason why the same mechanism can't operate today.

Obviously, these economic considerations can sometimes be trumped by other priorities, such as protecting privacy and consumer safety. But if increasing investment and broadening innovation are integral to reviving America's economic dynamism and shared prosperity—and they are—our leaders will have to give them greater priority. And one way to start is to celebrate the companies that are making the biggest bets on America's future.

## **APPENDIX: METHODOLOGY**

Our U.S. Investment Heroes ranking for 2015 follows a similar methodology to last year. We started with the top 150 companies of the 2015 Fortune 500 list as our universe of companies. We removed all financial and insurance companies, since their reporting of capital expenditures is

not consistent with our interpretation of plants, property, and equipment. We then estimated the amount of gross capital expenditures in the United States for 2014, and ranked the companies in order of their total estimated U.S. capital expenditures.

For these rankings, we used each company's most recent available fiscal year statements. In general, that's the calendar year 2014, but in some cases, such as Microsoft and FedEx, their most recent fiscal year ended June 30, 2015. Throughout this report, we refer to our estimates as "2014." The companies in these rankings are all based in the United States. Non-U.S. based companies were not included in this list because of data comparability issues, although there are non-U.S. companies that invest in this country.

Most multinational companies do not provide a breakdown of capital expenditures by country in their financial reports. However, PPI has developed a methodology for estimating U.S. capital expenditures based on the information provided in the annual 10-K statements. This methodology should in most cases provide a reasonable approximation to actual spending.

Our estimation procedure goes as follows:

1. If a company has small or no foreign operations, we allocated all capital spending to the United States.
2. If a company reported U.S. capital spending separately, we used that figure.
3. If a company did not report U.S. capital spending separately, but did report changes in U.S. long-lived assets or plant and equipment, we were able to use that information plus depreciation rates to estimate capital spending.

In a small number of cases, including major acquisitions, we look for proxies that enable us to allocate capital spending. For consistency, we omitted capital spending by the finance arm of companies such as General Electric and General Motors.

We paid special attention to AT&T and Verizon, the top two companies on our list. In its statement, AT&T reported its assets were "predominately in the United States." For Verizon, no international

distribution of assets were reported, even though there are some international operations. We adjusted our estimate for Verizon's international operations using the share of international employees as a proxy. Based on our analysis, both companies would retain their top spots under any reasonable set of assumptions.

### NON-ENERGY U.S. INVESTMENT HEROES

As a complement to our complete U.S. Investment Heroes ranking, we are also presenting a non-energy list (Figure 7). This list ranks the top U.S. companies investing domestically, according to our estimates, that are both non-financial and non-energy.

The non-energy ranking includes the non-energy companies from our complete ranking but has also made room for other companies,

many of them returning from last year's non-energy list. United Continental and Delta are on the list again this year, joining the American Airlines Group from our complete ranking. Like American, these airlines have continued to invest in modernizing their aircraft. Boeing also repeated its significant U.S. capital expenditures, investing in the manufacture of commercial airplanes and military aircraft.

Dow Chemical reaches the list with domestic capital expenditures in 2014 of just under \$3 billion. Dow largely spent on additional capacity for new and existing products while also dedicating a portion of capital expenditure to environmental protection. Kroger and CVS were significant domestic investors again this year with store openings, expansions and relocations guiding their expenditures.

FIGURE 7: NON-ENERGY U.S. INVESTMENT HEROES: TOP 25 NON-FINANCIAL COMPANIES BY ESTIMATED U.S. CAPITAL EXPENDITURE

Rank	Company	Estimated 2014 U.S. Capital Expenditures (millions of dollars)	Rank	Company	Estimated 2014 U.S. Capital Expenditures (millions of dollars)
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5	Comcast	7,420.0	18	Kroger	2,831.0
6	Intel	6,535.2	19	Delta Air Lines	2,249.0
7	American Airlines Group	5,311.0	20	Boeing	2,236.0
8	General Motors	4,924.4	21	Johnson & Johnson	2,136.2
9	Amazon.com	4,808.3	22	CVS	2,136.0
10	Union Pacific	4,346.0	23	HCA Holdings	2,132.6
11	Time Warner Cable	4,097.0	24	HP	2,030.2
12	Apple	4,076.8	25	United Continental	2,005.0
13	FedEx	3,912.1	<b>Total</b>		<b>132,190.1</b>

Data: Company financial reports, PPI estimates

**ENDNOTES**

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9. Michael Mandel, “Where is Innovation Falling Short?: Using Labor Market Indicators to Map the Successful Innovation Frontier,” prepared for the Kauffman Foundation New Entrepreneurial Growth Conference, July 2015.
10. The government figures do not fully break out investment by pharmaceutical companies separated from the chemical industry. So the lower end of this range represents investment by hospitals and ambulatory care facilities plus private domestic pharma R&D spending, divided by the total number of hospital, ambulatory care, and pharma workers. The upper end of this range represents investment by hospitals, ambulatory care facilities, and the entire chemical industry, divided by the total number of hospital, ambulatory care, and chemical workers.
11. Michael Mandel, “Why Solvadi Boosts Medical Productivity,” Progressive Policy Institute, April 14, 2014, <http://www.progressivepolicy.org/blog/why-solvadi-boosts-medical-productivity/>.
12. Michael Mandel and Diana G. Carew, “Regulatory Improvement Commission: A Politically Viable Approach to U.S. Regulatory Reform,” Progressive Policy Institute, May 2013, [http://www.progressivepolicy.org/wp-content/uploads/2013/05/05.2013-Mandel-Carew\\_Regulatory-Improvement-Commission\\_A-Politically-Viable-Approach-to-US-Regulatory-Reform.pdf](http://www.progressivepolicy.org/wp-content/uploads/2013/05/05.2013-Mandel-Carew_Regulatory-Improvement-Commission_A-Politically-Viable-Approach-to-US-Regulatory-Reform.pdf).







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