IMPORTANCE OF PRODUCTIVITY

INVESTMENT STRATEGY GROUP

August 2019
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Summary:
Productivity is critical for higher living standards, economic growth, and corporate performance. We see several key factors that could sustainably boost U.S. productivity in the coming years. We discuss these factors, their impact on major sectors of the economy, and the resulting investment implications in this piece.

IMPORTANCE OF PRODUCTIVITY

Higher productivity is critical for sustainable economic growth and directly linked to higher living standards—a highly productive workforce is well positioned for higher compensation and ultimately better living standards.

Productivity is critical for economic growth. The potential growth rate of an economy is governed by two major factors:

1) Labor force growth — how many workers are available to produce goods and services and;
2) Productivity — how much output can the labor force generate from the economy’s assets.

Higher productivity puts downward pressure on unit labor costs (compensation gains minus productivity growth), which ultimately results in lower inflationary pressures. This gives the Federal Reserve flexibility on interest rates and is a major driver of a prolonged economic expansion.

Studies show high productivity firms’ stock prices outperform low productivity firms (more on this below).

With an unemployment rate below 4%, over seven million current job openings, and significant numbers of baby boomers retiring every day, productivity improvement is needed to offset tight labor market conditions.

RECENT PRODUCTIVITY TRENDS

Throughout the recovery from the Great Recession, productivity has been persistently low. However, recent productivity has shown promising improvement (see chart below). We think tax reform and digitization are major factors that will result in sustainably higher productivity in the coming years, to the benefit of the U.S. economy and its workforce.

U.S. Non-Farm Productivity

[Graph depicting productivity growth from 1993 to 2017, highlighting periods of weak, waning, and promising productivity improvements.]

Source: Janney Investment Strategy Group, Bloomberg
TAX REFORM HAS IMPORTANT PRODUCTIVITY IMPLICATIONS

Business investment is a key driver of future productivity growth. The last productivity boom coincided with significant increases in business investment. The primary focus of the Tax Cuts and Jobs Act, which passed into law in late 2017, was structural changes to the business side of the tax code. Many provisions within this law are geared toward increasing business investment.

The corporate tax rate, which was the highest in the industrialized world, decreased from 35% to 21%. This provision makes the U.S. much more competitive for attracting global investment and keeping existing investment—it takes away the incentive for moving corporate headquarters and research facilities to lower tax countries.

The law also allows business to fully expense equipment in the year it is purchased—another major incentive for business investment. There was a one-time mandatory tax on accumulated foreign profits, which essentially frees up an estimated $2.5 trillion in earnings held overseas for potential investment in the U.S.

Significant deregulation has recently occurred which should also boost productivity by eliminating red tape for business. The Trump administration has been cutting regulation at a record pace—the number of pages in the Federal Register, the government’s regulatory bible, was cut by 36% in his first year in office alone.

DIGITIZATION — A DRIVER OF FUTURE PRODUCTIVITY GAINS

The last period of high productivity occurred in the late-1990s-to-early-2000s timeframe. It was driven by the personal computer, software, and database system information technology (IT) revolution. The IT revolution enabled the efficient restructuring of domestic corporate operations and global supply chains and resulted in significant productivity gains.

In the aftermath of the financial crisis, productivity suffered from weak demand, uncertainty, excess capacity, and a bust in finance, real estate, and construction—in addition to the waning of the IT revolution. This weak productivity performance was also a global phenomenon, suggesting financial crisis aftermath effects. The economic expansion of the last decade has worked off many of these productivity drags and we see digitization as a key enabler of higher productivity in the coming years.

Mobile computing, automation, robotics, big data and the ability to analyze data using artificial intelligence (AI) and machine learning are all important aspects of digitization. A recent study by McKinsey Global Institute, a leading think tank for corporate America, estimates that overall productivity could sustainably reach over 2% with more than half the gains coming from digital opportunities—impressive considering productivity has struggled to reach even 1% since the financial crisis.

McKinsey estimates that the U.S. operates at only 18% of digital potential, with large sectors lagging—suggesting significant future opportunities for improvement.

Please see the special box on major digitization enablers for additional detail.
**MAJOR DIGITIZATION ENABLERS:**

**AI • CLOUD COMPUTING • 5G**

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**Artificial Intelligence:**

Artificial intelligence (AI) is the development of computer systems that are able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages. AI is different from traditional software programs in that it extracts knowledge from data and can alter its behavior (or learns) without specifically being programmed, i.e., machine learning.

Advanced data analytics and artificial intelligence (AI) have demonstrated significant potential for transforming business models and disrupting industries. While every sector of the economy is being impacted, we see the benefits far outweighing the disruptions. Advanced data analytics and AI are critically important for future productivity gains.

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**Cloud Computing:**

Cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet (“the cloud”) to offer faster innovation, flexible resources, and economies of scale. Users (corporations, governments, or individuals) typically pay only for cloud services they use, helping lower operating costs, run infrastructure more efficiently, and scale as business needs change.

The secular shift to cloud computing is occurring because of the many demonstrated benefits. It is reducing the cost of buying hardware and software and maintaining on-site data centers. Users have the ability to quickly scale up operations and operate in diverse geographic regions. Cloud service providers offer improved performance, regularly upgrading to the latest generation of computing hardware. Service is also offered on demand; vast amounts of computing resources can be provisioned in minutes, giving businesses increased flexibility and taking the pressure off capacity planning.

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**5G:**

The fifth generation of mobile communication networks, or 5G, will bring faster, more reliable cellular and Internet connections—similar to previous generations. 2019 is the first year that 5G technology is seeing a material deployment.

Data transfer speeds are projected to be about 10 times higher with 5G than is possible with 4G. That means significantly faster transmission of images and videos. With 4G/LTE, downloading a high-definition movie might take about 10 minutes. With 5G, it can take less than a second.

Latency time, the brief lag in time from when data is sent to when it is received, will be reduced with 5G. While this helps watching high-speed virtual reality video with no delays or glitches, this real-time connection has important implications for industrial automation. 5G cell towers will also have greater capacity that will enable more devices to communicate at the same time.

The combination of speed, responsiveness, ultra-reliability, and greater connectivity will help unlock the full capabilities of other important productivity enhancing technologies, offering benefits to self-driving cars, drones, robotics, the Internet of things ecosystem, and virtual reality health care (including remote surgery).
SECTORS/INDUSTRIES THAT ARE BENEFITING FROM HIGHER PRODUCTIVITY

A recent study by Cornerstone Macro (an economic and investment research firm) shows that firms with high productivity growth outperform low productivity firms. This study proxied productivity with value added per employee, with value added defined by sales minus cost of goods sold (a profitability measure). High productivity firms outperformed both across industries and within them. The high productivity firms (measured by the top quintile of the S&P 1500 stock index) generated an average return of 17% since 2010, while low productivity firms (measured by the bottom quintile) returned only 9%. This clearly demonstrates the need and importance for improving firm productivity.

We see many industries that have opportunities to increase productivity. The table below summarizes the productivity enhancing opportunities across industries using digitization and other techniques. Firms taking advantage of these opportunities will remain well positioned for success. While many industries can benefit from greater efficiencies due to digitization, many Internet, software, IT services, and semiconductor firms benefit as digitization enablers.

### Industries Benefiting From Productivity Enhancing Opportunities

<table>
<thead>
<tr>
<th>Industry</th>
<th>Productivity Enhancing Opportunities</th>
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<tbody>
<tr>
<td>Internet</td>
<td>Internet companies, as pure digital entities, have taken the lead in both generating big data and utilizing AI to analyze it. They are also leaders in cloud computing and will benefit from 5G development.</td>
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<tr>
<td>Software, Information Technology Services, and Semiconductors</td>
<td>Many of these firms are well positioned to capture future technology spending that needs to take place by all industries. Software and semiconductors provide the building blocks for digitization.</td>
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<tr>
<td>Banking and Finance</td>
<td>AI will enable automated trading &amp; investment, trading strategies, robo-advisors, voice-based commerce, customer behavior analysis, chatbots for customer services, identity verification, and fraud detection. Opportunities also exist for compliance, branch consolidation, digital wallets, mobile and online banking. Blockchain is also a promising technology for this industry.</td>
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<tr>
<td>Insurance</td>
<td>Claims management and fraud detection, analyzing customer behavior and reducing revenue churn, automated underwriting, pricing, conversational platforms for customer services, complying with regulations, and trading strategies.</td>
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<tr>
<td>Health Care</td>
<td>Digitization is enabling many opportunities - diagnostics, image analytics for early disease detection, drug discovery, patient monitoring (pre-emptive warning systems), personalized medicine and treatment. Robotics is also improving surgical outcomes.</td>
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<tr>
<td>Media &amp; Communications</td>
<td>Customer analytics, forecasting and customer demand trends, video analytics, computer vision interactivity (e.g. in video games and other immersive media).</td>
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<td>Manufacturing, Mining, Oil &amp; Gas Extraction</td>
<td>Advanced robotics, 3D printing, predictive maintenance, machine learning driven insights for yield improvement, and optimization are all promising opportunities. Oil &amp; Gas industry has been a major beneficiary of digitization and other advanced technologies with significant productivity gains.</td>
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<tr>
<td>Retailing and e-commerce retailers.</td>
<td>Digitization is enhancing: Customer analytics, forecasting, anticipating demand trends, reducing revenue churn, supply chain management, warehouse automation, chatbots for customer services, conversational commerce. Goods handling with robotics/drones. Secular shift to online retailing is driving many productivity opportunities.</td>
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<td>Supply Chain Management</td>
<td>Warehouse automation, inventory management based on insights gleaned from demand analytics, autonomous delivery.</td>
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<td>Transportation</td>
<td>Connected cars, self-driving vehicles, advanced driver assistance systems, personalized content delivery / productivity enhancement tools used by providers of transportation services represent promising opportunities.</td>
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<tr>
<td>Utilities</td>
<td>Enhanced supply-demand management based on AI-driven analytics, predictive maintenance, dynamic pricing based on consumption analytics (provided by smart meters, for example), chatbots for customer service. Drones for inspection. Energy storage using advanced battery technology.</td>
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<tr>
<td>Government</td>
<td>Smart surveillance, threat detection, smart cities and utilities, AI-enhanced and personalized education and training, chatbots for information distribution and citizen engagement.</td>
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(Source: Janney ISG, Gartner, Capgemini, McKinsey Global Institute)

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