

CIO Flash Bulletin

Productivity and the promised revolution

Investment Solutions

30 July 2018

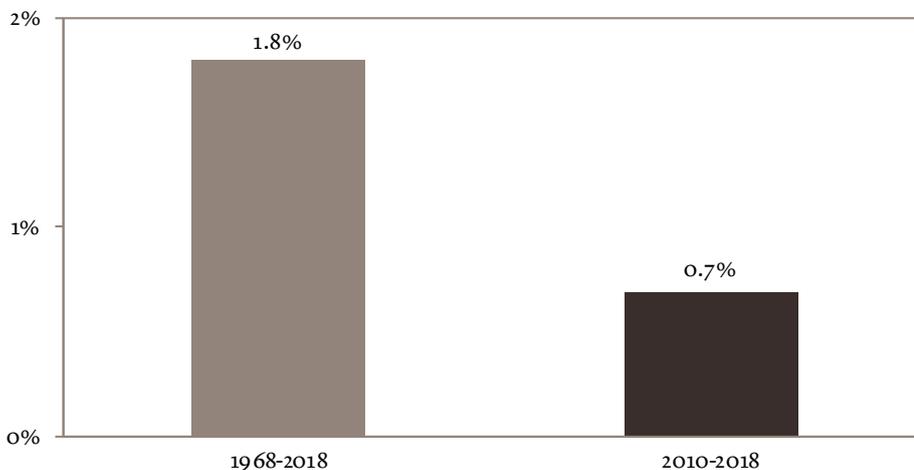
When Steve Jobs unveiled the “revolutionary and magical” iPhone in 2007, it seemed reasonable to suppose that smart mobile devices would not only change the way we interact, but help us to do more with our time. In fact, measures of productivity growth across many developed economies have halved, or worse, in the decade since the arrival of the iPhone. Why did productivity growth shrink and why should investors care?

The productivity paradox

This contradiction between potential game-changing innovations and weak higher productivity is known as the productivity paradox. How can productivity statistics be so disappointing in an age of technological disruptions such as autonomous cars, big data and artificial intelligence? Is the digital, or fourth industrial revolution, simply less revolutionary than the first three that brought us electricity, chemicals and the telephone? The question is key because lagging productivity growth leads to falling gross domestic product and poorer corporate earnings growth, which ordinarily, depresses growth in equity prices.

Let's look at the data. Since the financial crisis, productivity statistics point to a common trend. US labour productivity has grown on average 0.8% annually since 2010 compared with 2.9% over the last decade and 1.8% for the last fifty years (see chart 1). The same story is broadly true of OECD economies (see chart 2). This decline is worrying because technological progress is a key driver of long-term potential growth.

Chart 1: US labor productivity growth (yearly average)



Source: Bloomberg, Bureau of Labor Statistics



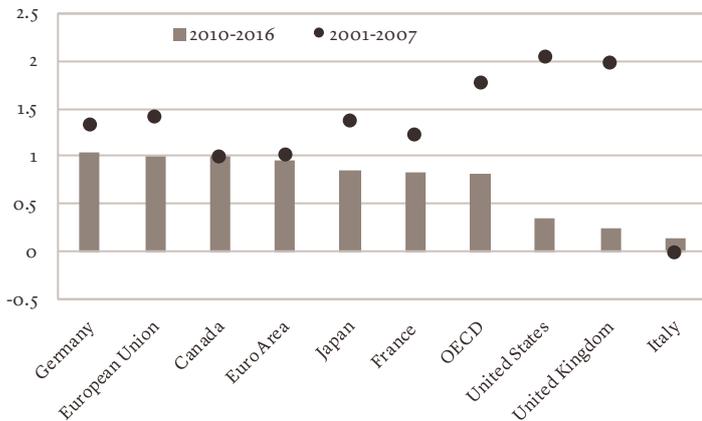
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Chart 2: Labour productivity growth before and after the crisis

Source: OECD Compendium of Productivity Indicators 2018

“Productivity is what pays for pay rises. And productivity is what puts life into living standards,” said Andy Haldane, the Bank of England’s chief economist, in a 28 June speech. The stall of real wages and productivity growth “is almost unprecedented in the modern era, a ‘lost decade’ and counting,” Haldane said.

Technology’s failure to boost productivity is also known as the Solow paradox after a July 1987 book review in which the Nobel prize-winning economist Robert Solow pointed to the fact that a technological revolution was paralleled “everywhere... by a slowdown in productivity growth.”

Several economists blame new technologies for limiting productivity gains while generating high expectations. There are three potential explanations for the mismatch between statistical reality and expectations. Either we are too optimistic about the potential impact of innovations, or we are too pessimistic about the measured productivity, or a bit of both.

Technology, some argue, means that for the most part we are making existing products faster. Over time, low productivity sectors have come to occupy a larger share of the economy. And while innovation continues, goods have become cheaper rather than create major new product categories meaning that consumers are spending less on manufactured goods. Looked at more positively, we know (or should) that material wealth maximisation will not make us happier, but services just might.

Optimism and pessimism

The hope is that now, we may be close to a tipping point. There are synergies between technologies, which mean that we are sure to see the scaling-up of digitalisation. Think, for example, of food processing which employs increasing automation and mechanisation. Or agriculture, where microsensors and big data translate into less waste, more efficiently applied inputs and lower costs, or the evolution of the Internet of Things, which couples real world objects with interconnected management. Put differently, the productivity gains from digitalisation such as artificial intelligence, the cloud, 3D printing and blockchain data management are only at their very earliest stages. In the same way that after the invention of the electric dynamo to succeed the steam engine, it took decades to learn how to make use of it by reorganising factories accordingly.

On the other hand, economist and historian Robert Gordon revives a “secular stagnation” theory, arguing that the golden age

of innovation is over. We are overestimating the impact of today’s technological advances in medical devices, artificial intelligence or the Internet of Things, Gordon argues, because iPhones, for example, have limited economic impact compared with the “great inventions” such as electricity or automobiles. Moreover, the iPhone might help us enjoy our free time, but also distracts us when we are supposed to be more productive. In addition, technological disruptions are probably concentrated in specific companies, sectors or countries and it results in private economic profit rather than widespread productivity gains.

Further, the doubters argue that instead of technological innovation trickling down throughout the economy as highly tech-savvy employees move between firms, instead, the tech-savvy tend only to move between the most innovative companies, leaving the vast majority to their under-performance.

Statistically missing

The optimists argue that statistics are missing something because the models cannot properly capture the contribution of the new economy. Indeed, the sectoral shift from industries to services in advanced economies is key to solving the productivity puzzle. While representing a small share of GDP, new “digital” services such as social media, search engines or machine learning applications can improve our standard of living and make the economy more efficient. For instance, last year, Google reduced the amount of energy for cooling its data centres by 40 percent by applying machine learning to optimise resources. In that sense, empirical statistics may prove too pessimistic.

Finally, both optimists and pessimists may agree that it takes time to translate the benefits of technological progress into productivity growth. This time lag – between the availability of an innovation and its common use – could explain both the low productivity growth and the hopes regarding new technologies. In fact, new technologies require new workers’ skills, new business models, complementary innovations and adequate regulations. And as Robert Solow acknowledged in 1987, “computers are everywhere but [not] in the productivity statistics”. One decade later, productivity started to pick up. The same evolution occurred with automobiles that produced enthusiasm in the early 1900s while having a visible impact on productivity only in the 1920s.

The two views of productivity also fail to see that there have been intermittent falls in productivity independent of technological innovation.

What impact on equities?

Falling capital expenditure in the wake of the financial crisis damaged productivity as high unemployment meant it was more cost-effective to hire more labour rather than make infrastructure investments. As monetary conditions start to normalise, rising capex may improve productivity as wages increase and companies invest in machinery and equipment. Investors may start to reward companies that invest in their own businesses.

In sum, the optimists probably anticipate too much and the pessimists are overly disappointed. Without demographic stagnation, uncontrolled debt and rising inequality, potential growth will remain weak if technology does not eventually enhance productivity. We think technologies such as driverless cars or artificial intelligence will prove to be significant innovations, impacting productivity and economic growth in the near future but that will need time, patience and adaptability.

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