PRODUCTIVITY SLOWDOWN PUZZLE
STRUCTURAL, CYCLICAL OR ERRONEOUS?

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INVESTMENT
INSTITUTE

Jean Boivin (LEFT)
Economic and Markets Research Head, BlackRock Investment Institute

Gargi Chaudhuri (RIGHT)
Portfolio Manager, BlackRock Inflation-Linked Bond Portfolios

Rick Rieder (LEFT)
Chief Investment Officer, BlackRock Fundamental Fixed Income

Peter Stournaras (RIGHT)
Portfolio Manager, BlackRock Large Cap Series Portfolios

What is inside

Summary

Labour productivity has slowed sharply around the world. Why does this matter? Productivity is the key driver of potential growth rates and living standards in the long term. We dove into the possible reasons for sluggish productivity growth and its implications for monetary policy, asset prices and corporate capital management. Highlights:

- A productivity revival is crucial for getting ailing economies back on their feet. Productivity trends in coming years, we believe, will have a more far-reaching impact on economies and asset prices than market fixations such as how much the US Federal Reserve (Fed) raises interest rates in 2016 – or whether the European Central Bank will ease policy more. Productivity will be a major driver of policy decisions in the long run, in our view.
- The causes of the productivity slowdown vary across regions. A recent slowdown in capital expenditures (capex) per worker is the major driver in the developed world. A long-term slump in total factor productivity (a proxy for technological innovation) is exacerbating the trend. The latter is the main driver in emerging markets (EMs). This adds to current EM challenges such as China's economic slowdown and the commodity price crunch.
- We introduce three productivity scenarios with different implications for economies, policy and asset prices: 1) *Structural Slowdown:* productivity stays low as the benefits of today's innovations pale against those of the past (think electricity); 2) *Cyclical Rebound:* productivity growth rebounds as economies recover, rates rise and companies boost capex; 3) *Measurement Error:* official data underestimate the benefits of new innovations.
- A structural productivity slowdown would, over time, point to lower economic growth and higher inflation than currently priced in by markets. Central banks might raise rates sooner and faster than expected – yet end at a lower peak. The yield curve would flatten, while equities and credit would fare poorly.
- A cyclical productivity rebound would help keep inflation low in the long run, allowing central banks to increase rates at a gentler pace – but to a higher eventual peak. The yield curve would steepen, equities would rally and credit spreads would tighten, we believe.
- The *Measurement Error* scenario points to little change in monetary policy in the near term (economic slack would be unchanged). Yet as measurement errors are gradually corrected and central banks factor in higher potential growth, it indicates higher peak interest rates in the long run. Understated productivity does *not* imply an easier monetary policy stance, in our view.
- We think all three scenarios are at play to some extent, but we lean toward *Measurement Error*. Innovation is changing business so fast that traditional economic metrics simply have not kept up. Many technologies are bringing greater efficiencies at lower cost. When we consider the quality improvements and downward influence on prices of innovation, consumption and productivity growth look much better than official data would suggest.
- Productivity ties in with the debate on what companies should do with their cash. Share buybacks have become the favoured use of capital amid low rates. Buybacks and research and development (R&D) spending have delivered the highest shareholder returns in US markets since 1985, our analysis shows. The results for capex were mixed; cash acquisitions, dividends and debt reduction led to shareprice underperformance, we find.

Introduction

Labour productivity has slumped across the globe since the 2008 financial crisis. Why does this matter? Valuations have leapt ahead of the business cycle in many markets. The Fed has drawn the curtains on seven years of zero interest rates. This means an acceleration in economic growth is needed to support corporate profit margins – and valuations of risk assets. See *Cycles Out of Sync* of December 2015.

We debated the reasons for the productivity slowdown – and the long-term implications for asset prices. The tables below summarise our findings. These are broad strokes. Risks such as oil price swings or a Chinese currency devaluation could prove to be bigger near-term drivers.

We see four other reasons why productivity matters: 1) There are only two ways for an economy to grow: increase the size of the workforce or make workers more productive. The former is set to shrink – particularly in developed markets – as populations age. This means labour productivity is *the* key to reviving economies. 2) Productivity determines the natural speed limit of economies' growth rates – and the degree of inflationary pressures. This, in turn, has a big impact on the pace and destination of monetary policy normalisation. 3) Productivity is a driver of corporate profitability. More productive firms have a greater ability to sustain wage increases or return cash to shareholders. 4) Higher productivity and faster economic growth make it easier for indebted economies and companies to deleverage.

PRODUCTIVITY SCENARIOS

	Structural slowdown	Cyclical rebound	Measurement error
Description	▸ Productivity growth remains sluggish; economists downgrade their estimates of potential economic growth.	▸ Productivity growth returns to historical averages. Companies boost capex as uncertainty over policy and growth outlook ease.	▸ Official statistics understate the benefits of innovation – and underestimate productivity.
Policy	▸ Rising inflation leads the Fed to hike rates sooner – and at a faster-than-expected pace... ▸ ...but lower potential growth points to a lower peak rate.	▸ Tepid inflation leads the Fed to raise rates at a gentler-than-expected pace... ▸ ...but higher potential growth points to a higher peak rate.	▸ Fed policy is unchanged in the short term. ▸ Investors should anticipate potential for higher future GDP growth – and a higher peak federal funds rate.
Bonds	▸ The yield curve flattens. ▸ Breakeven inflation rates rise as wage growth accelerates. ▸ Credit fares poorly on rising rates and declining margins.	▸ The yield curve steepens. ▸ Breakeven inflation rates fall on soft wage growth. ▸ Stronger growth expectations support credit markets.	▸ The yield curve steepens. ▸ Breakeven inflation rates fall on soft wage growth. ▸ Credit outperforms US Treasuries as the economic growth outlook improves.
Equities	▸ Equity markets fall on expectations of lower growth and profit margins. ▸ Cyclical sectors such as industrials and IT underperform.	▸ Equities gain as higher productivity and loose policy support earnings. ▸ Cyclicals such as industrials and IT outperform; steep yield curve helps financials.	▸ Equity markets get a modest boost. ▸ IT sectors outperform as better data confirm robust productivity growth in the sector.

	Short-term rates	Long-term rates	Breakeven inflation	Credit spreads	Equities
Structural slowdown	↑	↓	↑	↑	↓
Cyclical rebound	↔	↑	↓	↓	↑
Measurement error	↔	↑	↓	↔	↔

Source: BlackRock Investment Institute. January 2016. For illustrative purposes only.

Productivity breakdown

No developed economy has escaped the productivity blues. Productivity growth has screeched to a halt in the UK and Italy since 2011. See the chart on the right.

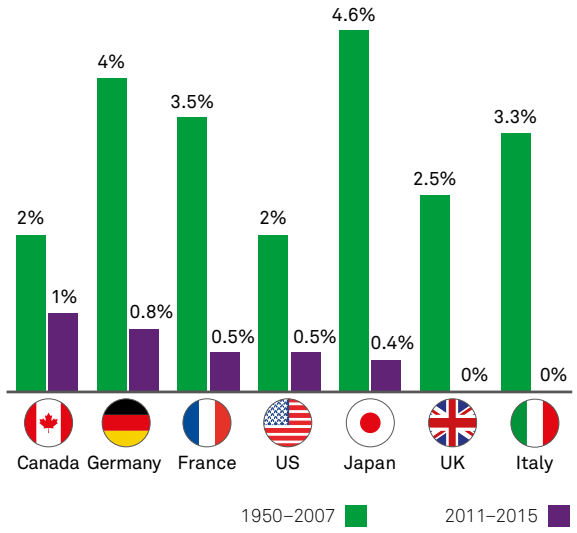
Japan's labour productivity has been growing at less than one-tenth the pace of previous decades. The US has fared no better than France – and worse than Germany over the past four years. Canada was the relative outperformer. Yet the productivity bar is low; the chart shows Canada was the G7's worst performer in the prior 60 years.

Is the productivity slowdown structural – or cyclical? It appears to be a bit of both. The productivity slowdown was evident well before the financial crisis, especially in the US. Yet labour productivity has slowed since 2008 in the US and even more so in the European Union. See the charts below. Economies suffered from a double whammy after the crisis as shrinking labour forces and poor productivity weighed on economic growth.

Credit booms tend to undermine productivity growth, the Bank for International Settlements posits in a *recent study.* Booms lead to a shift of labour into lower productivity industries (think construction), it argues. The productivity hangover tends to persist long after the bursting of credit bubbles, the BIS concludes.

POST-CRISIS BLUES

Labour productivity growth in the G7, 1950-2015



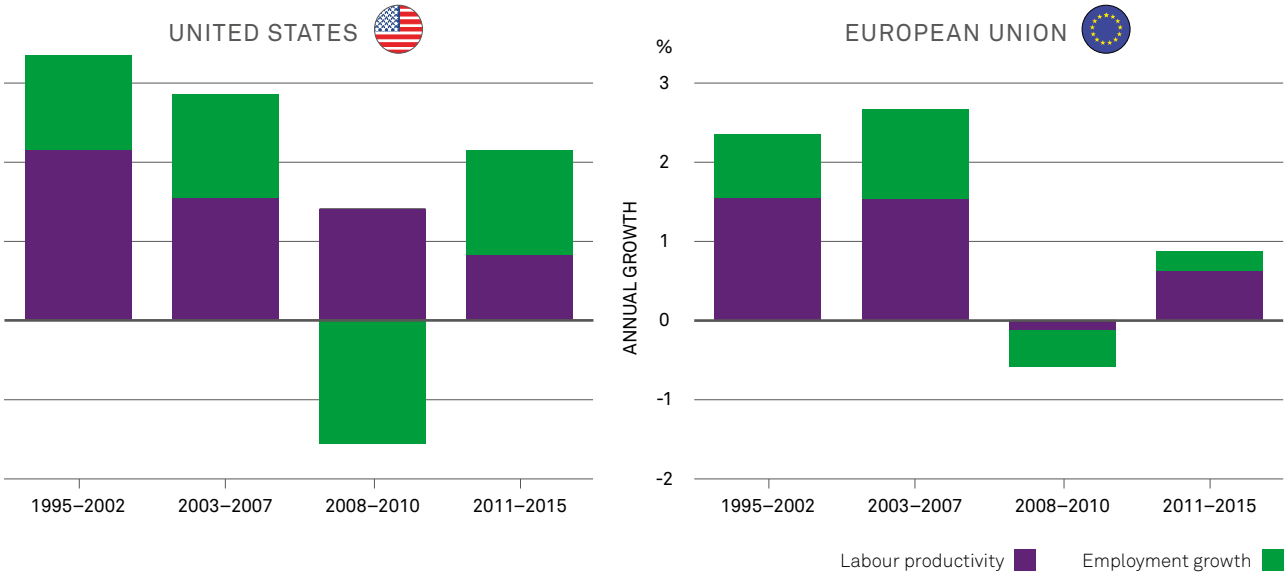
Sources: BlackRock Investment Institute and The Conference Board, November 2015. Notes: the bars show the average annual growth rate in labour productivity per hour for each period.

TRILLION DOLLAR QUESTION

Productivity is a trillion dollar question. Consider the difference between US GDP growth of 2% or 3% over the next decade. The latter scenario, which assumes 1% faster productivity growth, would result in an economy more than $2 trillion larger – roughly the size of Italy's economy, we calculate. This is no small change.

PRODUCTIVITY BREAKDOWN

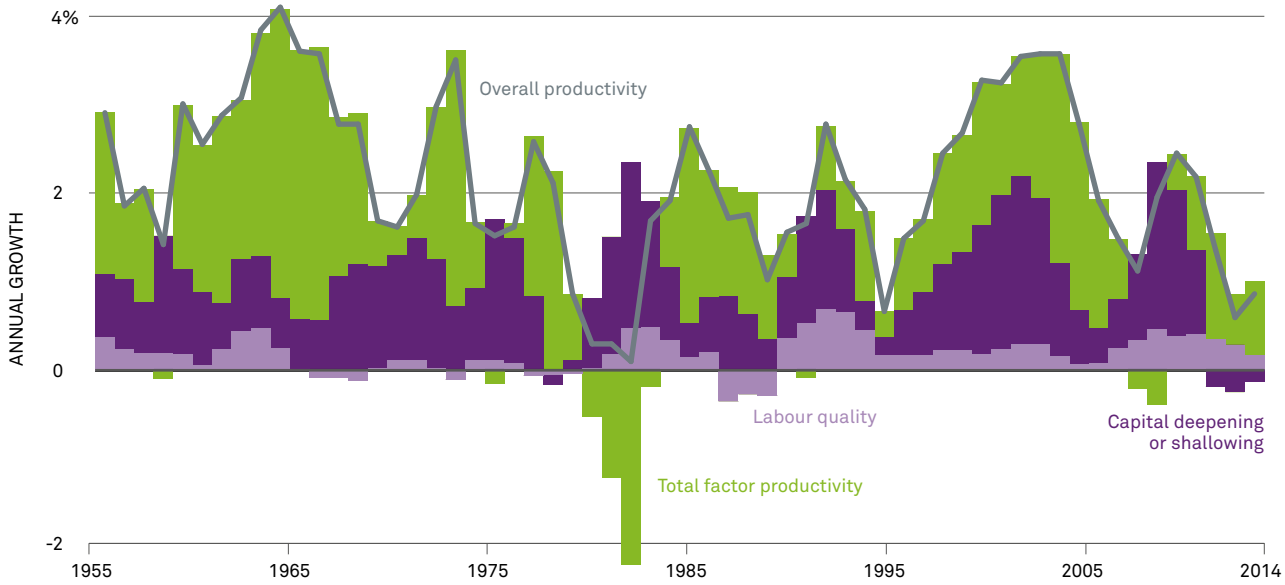
Employment and productivity contribution to GDP growth, 1995-2015



Sources: BlackRock Investment Institute and The Conference Board, December 2015.
Notes: the bars show the average contribution to annual GDP growth over the selected periods. The European Union is based on EU-28 members. The time periods represent the dot-com boom and bust (1995-2002), the pre-crisis expansion (2003-2007), the global financial crisis (2008-2010) and the post-crisis recovery (2011-2015).

CAPITAL SHALLOWING

US productivity growth breakdown, 1955-2014



Sources: BlackRock Investment Institute and US Bureau of Labor Statistics, December 2015. Note: the chart shows three-year moving averages.

WHAT WENT WRONG?

To better understand the productivity decline, we need to peek below the surface. There are three ways to raise labour productivity:

1 **Capital expenditures:** increase capital per worker – or spending on plants, equipment and software. Call it capex or 'capital deepening.' See the dark purple bars in the chart above.

2 **Labour quality:** raise the skills and education levels of workers (light purple).

3 **Efficiency:** squeeze greater efficiencies out of the workforce through innovation, management or investments in intangible capital such as intellectual property. This is measured as total factor productivity or TFP (green).

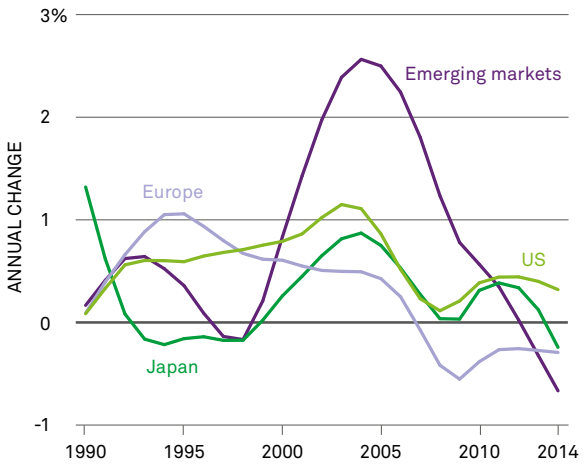
The recent US productivity slump has been driven mostly by a reversal of the first factor. Capex growth has been negative, effectively turning capital deepening into capital *shallowing*. Note: capital spending tends to move in cycles. The capital shallowing of recent years may be temporary, reflecting weak demand due to the sluggish economy and uncertainty about monetary policy.

The chart also shows a long-term decline in TFP. This is worrying – and points to a decline in (measured) technological innovation. TFP growth has actually turned negative in Europe, Japan and EM. See the chart on the right. This is hard to square with the innovations of the digital economy. One explanation: the benefits of many new technologies are not yet captured in economic data.

The EM productivity decline has been steepest. These economies have picked the low-hanging fruits of urbanisation, shifting workers from agriculture to industry and creating a middle class. Now they must shift from imitation to innovation. The problem? Reform efforts are stalled in many countries and labour costs are rising. Some are trying to wean themselves off an addiction to fixed asset investment (China) or consumer credit (Brazil), setting themselves up for painful deleveraging.

PRODUCTIVITY PLUMMETS

Productivity growth in selected economies, 1990-2014



Sources: BlackRock Investment Institute and The Conference Board, December 2015. Notes: productivity is measured as annual growth in total factor productivity. The growth rate is smoothed by using a Hodrick-Prescott filter to remove short-term fluctuations caused by business cycles. The Europe category is based on European Union members plus Iceland, Norway and Switzerland.

TRADE TREMORS

A decline in global trade growth may also lie behind the EM productivity slowdown. Trade increases competition and spurs diffusion of new technologies. EM productivity growth has shown a tight relationship with export volumes in past decades. It slumped after the mid-2000s, coinciding with a peak in EM export growth. See the chart below. This could mean globalisation has plateaued, or paused at best. Global trade grew 2.8% in 2014, compared with an annual average of 5% since 1990, according to data from the World Trade Organization.

EMERGING LINKAGES

EM total factor productivity and export growth, 1990-2014

Sources: BlackRock Investment Institute, International Monetary Fund (IMF) and The Conference Board, December 2015. Note: the chart shows three-year moving average for both series.

DIFFUSION DIFFERENCE

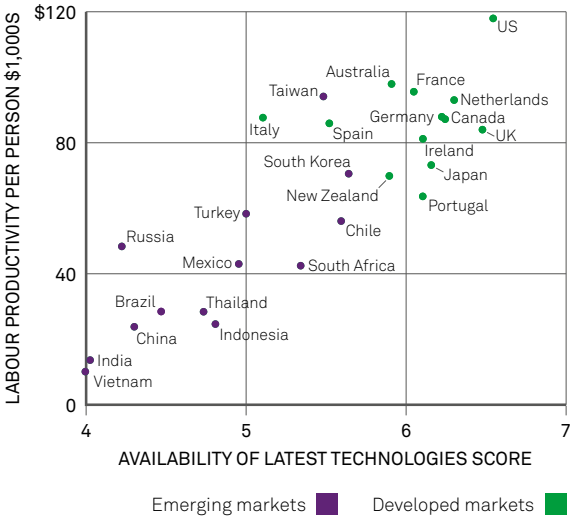
The availability of technologies such as broadband internet is a key driver of labour productivity across countries, survey data show. See the chart on the top right. The US tops the chart, with high diffusion rates of new technologies – and the highest per-capita labour productivity in the world.

Developing economies such as India, Vietnam and China bring up the rear. These economies lag in the diffusion of new technologies (notwithstanding hype about Chinese internet and e-commerce giants), and labour productivity is relatively low.

The problem? Productivity growth is disruptive, as it implies using fewer workers to produce the same amount of goods. Finding jobs for the displaced workers is a challenge for emerging markets trying to rebalance their economies amid slugglish economic growth.

TECHNOLOGY BOOST

Global productivity levels and availability of technology, 2015



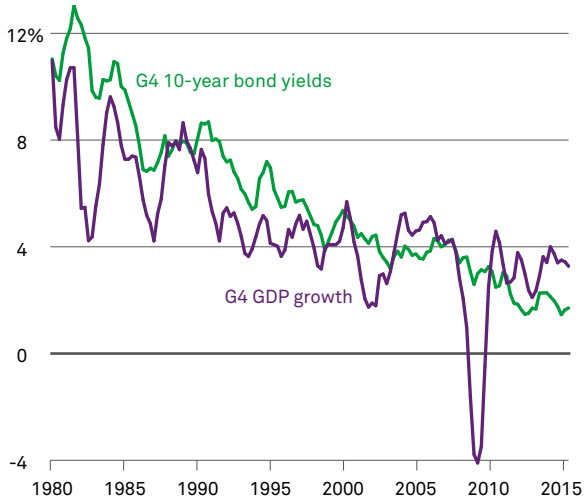
Sources: BlackRock Investment Institute, The Conference Board and World Economic Forum (WEF), December 2015. Notes: labour productivity is per employed person, measured in US dollars at 2014 price levels and 2011 purchasing power parity rates. The availability of the latest technologies is based on the WEF Global Competitiveness Report 2015-16. Scoring is based on a WEF survey of more than 14,000 business leaders in 140 economies.

RATE RELATIONSHIP

Across the world, productivity is the key driver of nominal growth. Falling nominal growth, in turn, has tracked a steady decline in long-term yields since 1980. See the chart below. If the productivity decline is structural, it points to lower interest rates for longer. A cyclical rebound would involve higher rates in the long run, we think. See pages 7 and 8.

LOW FOR LONG?

G4 nominal GDP growth and bond yields, 1980-2015



Sources: BlackRock Investment Institute, Thomson Reuters and OECD, December 2015. Notes: the G4 consists of the US, Germany, Japan and UK. Nominal growth and 10-year benchmark government bond yields are weighted by GDP at purchasing power parity.

Tale of three theories

Productivity pessimists argue the slowdown is structural – and may not reverse itself any time soon. This gloomy lot believes the impact of today's innovations will fall far short of the effects electricity and the steam engine had. Perhaps such inventions only come around once every few centuries. This would imply we are returning to a 'low normal' of subdued productivity growth. Think medieval times.

In addition, new technologies and the 'sharing economy' are disrupting existing business models and allow companies to get by with less physical capital. The rise of these asset-light businesses is good for consumers – but depresses productivity-boosting capex.

E-commerce, for example, is flourishing in the UK at 12% of total retail sales, the Bank of England (BoE) notes in a *September 2015 blog*. Traditional retailers are struggling to downsize floor space and work forces. Result: productivity growth in the retail sector has stalled. The effects of online banking on consumer banks are similar.

A corporate focus on short-term results may also cause lower capex. UK companies are using discount rates 5%-10% higher than is rational to assess investment projects on a one-year horizon, according to a *2011 BoE paper*. In other words, firms appear to be setting the hurdle for capex too high. It is easier to increase earnings by buying back shares.

WINNER TAKES ALL

The growing gap between productive and unproductive firms suggests the diffusion of new technologies is slowing. So-called 'frontier' firms in the services sector raised productivity around 50% in the 2000s, OECD research shows. See the left chart below.

'Non-frontier' firms were left behind. Productivity was flat, while the entire corporate sector eked out a small gain. See the left chart below. The manufacturing sector shows similar (although less extreme) divergences, as the right chart below shows.

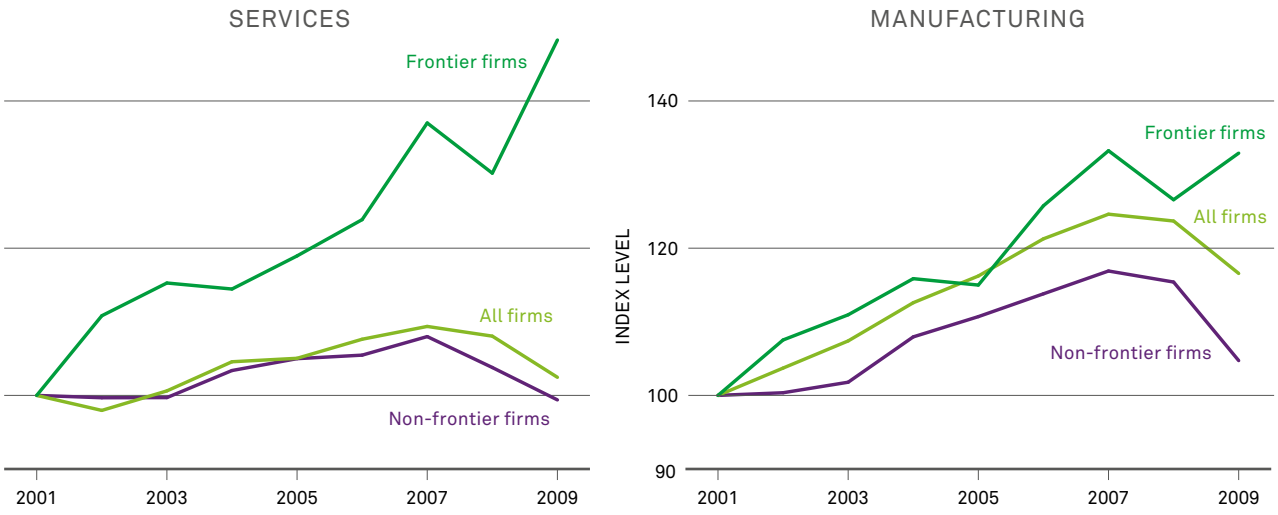
This reflects a winner-takes-all business world, in which the gap between strong and weak companies is widening. This trend only appears to have gotten stronger since the financial crisis. Think of the dominance of the leading players in internet search or online video streaming services.

STRUCTURAL IMPACT

What would the structural slowdown scenario mean for monetary policy and markets? Lower productivity growth would point to weaker potential economic growth – and less slack (excess capacity) in the economy. Wages would eventually start to rise – and companies would have to lift prices or cut into profit margins. All else equal, this would likely boost inflationary pressures over time. The Fed, the central bank furthest ahead in normalising monetary policy, would raise interest rates more quickly. This would threaten lofty asset valuations. Yet sluggish growth would point to a lower peak federal funds rate than in the past.

LIFE ON THE FRONTIER

Labour productivity of frontier vs. non-frontier firms, 2001-2009



Source: BlackRock Investment Institute and *OECD study*, November 2015. Notes: labour productivity is defined using value-added labour productivity. Services refer to non-financial business services. Frontier firms are defined as the top 50 most productive within each industry, by each year.

CYCLICAL REBOUND

Optimists argue a cyclical turnaround in productivity could be just around the corner. Fed rate increases could be a catalyst for higher productivity:

1 The Fed's tentative steps toward lift-off may have exacerbated worries about the strength of demand, leading firms to delay productivity-boosting capex.

2 Rock-bottom rates made it easier for highly indebted – and poorly performing – companies to remain on life support. Productivity should rise as these zombie firms are weeded out. And higher rates will make it less appealing for companies to issue debt and buy back shares, making capex relatively more attractive.

Other key points:

- Years of underinvestment in infrastructure mean the capital stock is ageing in many economies. Think of creaky roads, bridges and airports. The average age of the non-residential private capital stock in the US is at 50-year highs, according to data from the US Bureau of Economic Analysis. This suggests there is pent-up replacement demand.
- Governments around the world have committed to ambitious reform agendas. As these reforms bear fruit, productivity should pick up. Examples are 'Abenomics' in Japan or Prime Minister Narendra Modi's battle to tear up red tape in India. Caveat: governments rarely implement difficult structural reforms unless prompted by crises.
- Productivity per worker in recent decades was depressed by a huge influx of new workers in the 1990s from the opening up of China and the collapse of communism, Morgan Stanley argues in a September 2015 report. Productivity growth is set to rebound as global ageing makes labour markets tighter, it concludes.

A cyclical productivity rebound would boost economic growth. Higher potential growth would imply greater slack in the economy than is currently thought – and fewer inflationary pressures. Central banks would be in less of a hurry to raise interest rates (but would eventually increase them to a higher destination than in other scenarios). The yield curve would steepen in the long run, we believe. This is a positive scenario for equities. Profit margins would likely stay high, and monetary policy would remain accommodative for longer.

MEASUREMENT ERROR

A third camp argues the decline in productivity is a statistical mirage. Traditional economic metrics simply have not kept up with fast-changing technologies geared toward greater efficiency at lower cost, our *Measurement Error* scenario holds. It also may take some time for the benefits of these technologies to be realised, we believe.

New technologies such as cloud-based computing are driving down the cost of corporate investment and making companies more efficient. This is showing up in lower inventory levels, as detailed in a December 2015 *BlackRock Blog post*. One-fifth of the largest 1,500 US companies by market value now have zero inventories, up from 5% in 1980, according to Morgan Stanley data.

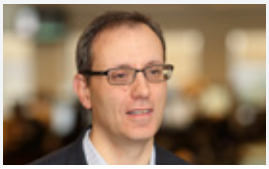
US consumers are adopting new technologies such as smart phones at the fastest rate since the advent of the television. These innovations arguably enhance our lives, yet are not accounted for in official data. Think of free apps that allow us to learn a language, check road conditions or monitor our health. Adjusting for rapid increases in the quality of software and digital content is another challenge. Statisticians try to factor in these improvements by tweaking price deflators, yet we think they still understate quality improvements – and, therefore, true productivity.

How much of the productivity decline do these deficiencies explain? Understated productivity means real annual US GDP growth may have been 0.7% higher than reported over the past five years, with consumer inflation *overstated* by 0.5% a year, Goldman Sachs estimated in a July 2015 report.

IT'S THE SLACK, STUPID

Does this mean central banks can keep rates low for longer? We do not think so. If the productivity slowdown is simply a measurement mirage, then both actual and potential growth are understated. The difference between the two – the so-called output gap – is unchanged. (We think labour markets are a better gauge of the amount of slack in the economy, anyway.) This means monetary policy would likely remain the same in the near term.

In the long term, the implications depend on whether the measurement error is recognised. Will statisticians and central bankers suddenly see the error of their ways, and respond accordingly? We are not holding our breath. Yet we could see gradual upward revisions to productivity data over time. This would point to higher terminal interest rates in the long run – and steeper yield curves.



"R&D generally creates innovation, new products and new ways of doing things. This leads to sales increases and is rewarded by the market. But it's important to pinpoint those companies that are most successful in their R&D efforts."

– **Joe Cerniglia**
Member of BlackRock's Quantitative Analysis Research Group

Capital management

Declining levels of corporate capex play into the productivity debate. Shareholders often encourage companies to invest for growth – but also react enthusiastically to news of share buybacks, increased dividends or buyouts. This begs the question: what is the best form of capital management for creating shareholder value?

We crunched the numbers on US stocks (Russell 1000) since 1985 and had three key findings:

1 Companies in the top quintile of spending on buybacks and R&D deliver the highest shareholder returns over one- and five-year horizons. See the tables below.

2 Capex (investment in property, plant and equipment) is by and large neutral. There is little evidence big capex spenders outperform in subsequent years.

3 Other uses of cash – acquisitions, dividends and debt reduction – result in share price underperformance. (Cash acquisitions are particularly bad news.)

The outperformance of buybacks and R&D holds true both for companies that ranked in the top buyback and R&D quintile over a one-year period (the left table below), and for serial buyback and R&D spenders (those ranked in the top quintile over five-year periods in the right table). Why such a strong result for R&D? It stimulates innovation, new products and more efficient ways of doing things.

CAPEX CONCLUSIONS

The results for capex are mixed. Companies ranked in the top capex quintile over one-year periods underperformed marginally in subsequent years, we found. Yet consistent capex spenders did a tad better than the index. These are broad strokes, however, and context and subtleties matter:

- Some companies are much better at getting bang for their capex buck than others. This is reflected in a wide dispersion of returns among the top quintile of capex spenders.
- There is a difference between maintenance capex (to keep the lights on) and growth capex (investing in the future). Capex that creates growth may generate returns more similar to R&D.
- The tendency of companies to invest heavily at cycle peaks is a detriment to long-term returns of our capex factor. Not all capex is created equal.
- Our study does not take into account cyclical factors such as economic, monetary policy and other trends (example: commodities supercycle). Capex dried up in the developed world after the financial crisis, arguably creating a need to rebuild depleted capital stock.

Buybacks offer a mirror image: they are a great idea when interest rates are at zero and growth is anaemic. They may be less effective when shares are pricey and interest rates are rising. Buybacks or dividends financed from increasing cash flows should be better for shareholders than those financed by a growing debt pile. The averages obscure these nuances.

BIGGEST BANG FOR THE BUCK

US stock returns of various forms of capital management, 1985-2015

Short-term capital management	Total returns	
(Measured over 1-year period)	1-year	5-year
Buybacks	14.51%	77.62%
R&D	14.43%	76.65%
Russell 1000 Index	*13.53%*	*73.10%*
Capex	13.02%	70.99%
Debt reduction	13.86%	69.29%
Dividends	12.69%	69.13%
Acquisitions	11.85%	66.58%

Long-term capital management	Total returns	
(Measured over 5-year period)	1-year	5-year
R&D	14.79%	78.78%
Buybacks	14.45%	78.69%
Capex	13.80%	74.47%
Russell 1000 Index	*13.53%*	*73.10%*
Dividends	12.81%	70.43%
Acquisitions	13.09%	69.25%
Debt reduction	14.59%	65.93%

Sources: BlackRock Investment Institute and Compustat, December 2015. Notes: the analysis is based on Russell 1000 universe excluding financials and utilities from 30 June, 1985 through 30 November, 2015. Companies are bucketed by quintiles over each period. Performance of each capital management bucket reflects the top quintile of companies that spent most on that form of capital management as percentage of sales over one- and five-year periods. The performance figures are absolute, equal-weighted and based on rolling one- and five-year windows. R&D expenses are from the income statement; other items are from statement of cash flows. Acquisitions are cash outflows used for acquisitions. Buy backs are the net use of funds that decreases common and/or preferred stock. Capital expenditures (capex) are cash outflows used for additions to property, plant and equipment. PP&E. Debt reduction is net reduction in long-term debt caused by its maturing, paydowns and the conversion of debt to stock. Dividends are cash dividends for common and preferred stock. Past performance is not a reliable indicator of future performance.

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