

## Eurozone Productivity Slides

### Introduction and Context

- Eurozone Productivity Growth over the past ten years has been weak.
- And slower than it was before the financial crisis period. Growth in output per worker averages just 0.6% between 2013 and 2016, compared with 1.0% between 1997 and 2007.
- Weakness has in part been down to cyclical factors, which may reverse, but this doesn't tell the whole story.
- Weakness is broadly-based (i.e. not simply confined to certain member states and or one or two key sectors). I'll look into this.
- Is productivity simply being mis-measured? After all, GDP data is subject to retrospective revision long after the period in question. Data may not fully capture improvements in the quality of technological innovation. BUT GDP growth appears broadly in line with other measures of economic activity (such as business surveys). This implies that simple mis-measurement is not a sufficient explanation. I investigate.
- Why is business investment so persistently lacklustre? Is it just a legacy from 2008? The

region's banking sector (despite ECB stress tests) remains extremely fragile. Furthermore, the region's credit crunch has stymied firms' willingness and ability to make productivity-improving investment.

- **Structural forces must be at work.** Slower productivity growth is by no means unique to the Eurozone. It can be seen across advanced and emerging economies, including those that have recovered more quickly from the crisis era. Moreover, productivity weakness has been visible since before the crisis period occurred (peak mid-1990s).
- I will examine what I see as the key structural drivers of the productivity slowdown and assess the scope for improvement. These are: an ageing population, the shift to a service-dominated economy, a slowdown in the pace of technological innovation and slower rate of diffusion of innovation to the average firm. There is also much evidence to suggest that the region's firms are slower to embrace new technology than their peers overseas.
- It is too early to say for sure that the Eurozone's economic renaissance is over, but recent data has proved weaker than expected (retail sales,

industrial activity, exports etc) and surveys have slipped off earlier high levels. There may be some scope for output per worker to recover (labour reform in France?), but structural headwinds are intense.

- Arguably, the key take-away for financial market practitioners is that a mild cyclical improvement in productivity would allow firms to absorb any pick-up in nominal wage growth, limiting wage-push inflation and thus allowing the ECB time to normalise monetary policy only very slowly.

**BTW,** The ECB itself seems to agree with this analysis as the minutes of its latest policy meeting tend to confirm no strong desire to tighten policy too aggressively or too quickly.

## **Will Productivity Growth Revive? (slide 2)**

- The outlook for productivity growth is key to determining how long the Eurozone's economic upturn can last and how strong growth might be in the more distant future. If productivity growth picks up from prevailing weak levels that should support sustainable growth without generating wage gains that would stoke inflation.
- If productivity does not revive, the ECB may need to tighten monetary policy much more quickly than markets currently envisage, throwing the region's economy into reverse potentially. That is not priced in.

## A Look Back (slide 3)

- Since the financial crisis period, the Eurozone's labour productivity growth has slowed (on both measures commonly used to define productivity...see these two charts).
- As the first chart shows, between 2013 and 2017 average annual growth in real output per worker was 0.7%, around two-thirds of its average rate in the decade before the crisis.
- This has not simply reflected a reduction in hours worked. Another measure of productivity output per hour worked also shows a slowdown (chart 2), from an average of 1.5% between 1997 and 2007 to 0.9% between 2013 and 2017.
- From now on, where possible, I shall focus on output per hour worked. This is important and emphasises the difference between the two measures. Critically, it is because this measure eliminates differences in the full / part-time composition of the labour force over time.

## **Productivity has slowed across member states**

- Let's look at this productivity slowdown in more detail for a minute. This chart breaks down the productivity experience by member states.
- It is clear that the slowdown has been widespread across member states and not confined simply to one or two individual countries.
- Average annual productivity growth between 2013 and 2016 was substantially lower in most countries than it was in the decade before the crisis, including core countries such as Germany and the Netherlands.
- With one notable exception...Spain! (see it here). Here productivity growth has proved stronger. This perhaps reflects the fact that before 2017 many workers were employed in the low-productivity residential construction sector. This is no longer the case today, albeit at the expense of much higher unemployment.
- Despite this still high unemployment, the Spanish economy is growing right now, so growth in output per hour worked has picked up.

## **Average labour productivity (output per worker, % y/y (slide 5)**

- This is a particularly interesting slide, I hope you agree? It shows the trend in productivity not by country but by sector.
- The construction and real estate sectors have seen a sharp increase in productivity growth since the crisis, as has the professional, scientific and technical activities sector.
- But productivity growth in all three sectors was very weak in the decade before the crisis. By contrast, there has been a sharp slowdown in the information and communication and the financial and insurance sectors, which had some of the strongest productivity growth prior to the crisis.

## Is Productivity Simply Being Mis-Measured? (sl 6)

- One possible explanation for the slowdown is that the data do not measure productivity accurately and that growth in output per worker, or per worker hour is, in fact, mis-measured.
- Given that it is fairly straightforward to count the number of people who are employed and how long they spend at work, any inaccuracies are more likely to be found in the GDP data. After all, they are regularly revised and sometimes years after the period in question. Moreover, they may not be fully capturing improvements in the quality of technology or the growing importance of the digital economy.
- Yet, Eurozone GDP growth has not been substantially weaker than business surveys such as the Composite PMI have suggested. True, the PMI may have inadequately sampled digital-focused firms (and may have a built in optimistic bias anyway).
- But, overall, since both the PMI and GDP data are painting a broadly similar picture, it would not seem to be the case that the GDP data are under-recording *actual* activity. This implies

that any mis-measurement effect is fairly small and does not change the fact that productivity growth has been sluggish for a long time.

- **Therefore, to understand whether this weakness in productivity growth will last or not...we need to work out why this has happened.**

## **Are Cyclical Factors to Blame? (slide 7)**

- As the chart shows, productivity and output growth tend to move broadly in tandem, at least as far as the Eurozone is concerned.
- It is not at all unusual for productivity growth to be weak in the early stages of an economic recovery.
- It is hardly surprising, then, that productivity growth has been weak following the global financial crisis and the subsequent regional debt crisis of 2011.

## The Eurozone Experience In Context (slide 8)

- The Eurozone's recovery has been slower than elsewhere.
- The regional economy only regained its pre-crisis size in late 2014, compared with 2011 for the USA.
- So perhaps it is not surprising that the revival is taking longer to see a sustained recovery in productivity growth.
- Indeed, in certain economies such as France and Italy industrial production remains well below pre-crisis levels to this day.
- The long period of weak demand meant that firms either disposed of, or didn't replace equipment, with investment falling sharply in the wake of the financial crisis.
- As a share of GDP, investment fell from 23% of GDP at the start of 2008 to as low as 19.6% in early 2013.
- Even in 2017, investment still accounted for a smaller share of GDP than it had 10 years previously.
- This has caused an unprecedented slowdown in the growth of the region's capital stock, with member states such as Italy and Spain the hardest hit.

- All else equal, increasing the capital stock more slowly should hamper productivity growth.
- Admittedly, much of the decline has been down to the drop in construction investment. This would have fewer direct implications for productivity than would investment in plant and machinery. Excluding construction, investment declined only marginally as a share of GDP in the wake of the crisis and now accounts for a bigger share than it did in 2007.
- But there are still good reasons to think that investment in capital has been held back by cyclical factors, most notably the prolonged weakness of the region's **banking sector**.
- Bank lending to firms only started growing in annual terms in 2015 and those loans that were extended were often accompanied by strict conditions.
- **Small firms** (which are usually more productive than larger ones) struggled in particular to secure financing.
- This was hardly conducive to firms ploughing money into productivity-improving investment and R&D, or to potential entrepreneurs taking the plunge and starting their own businesses.

- However (**as the previous chart also shows**) productivity growth has remained weak in recent years even as GDP has accelerated.
- **This suggests that cyclical factors are not sufficient to explain the persistent weakness of labour productivity in the Eurozone.**

## Cyclical factors are not confined to the Zone (slide 9)

- As the **chart** demonstrates, productivity growth has been slower in both advanced and emerging economies compared to the decade before the crisis.
- **And while the crisis almost certainly exacerbated the slowdown, production growth had already been slowing since the early 1990s.**
- This suggests that **structural forces** are also at work.

## Structural Drivers (slide 10)

- A number of structural factors have been highlighted as potential drivers of the region's productivity slowdown.
  1. The shift to the less productive service sector.
  2. An ageing population.
  3. A decline in technological innovation (relative to the 1990s).
  4. A reduction in the degree to which technological innovation is being transferred to firms at the cutting edge of technological developments to the rest.
- **I shall assess each of these potential drivers in turn.**

## Changes in economic structure (slide 11)

- **The productivity slowdown might reflect the ongoing shift away from manufacturing towards the service sector.**
- Since the provision of services tends to be more labour intensive and less capital intensive than manufacturing, the service sector is typically characterised by lower productivity growth and a lower *level* of productivity.
- Looking at the **chart**, over recent decades the service sector has certainly grown in importance.
- Back in 1975, in the largest current Eurozone countries, on average the sector accounted for less than 60% of total value-added production.
- Today, for the Eurozone as a whole, it is close to 75%.
- As the chart shows, the shift away from industry to the services sector has stalled since the crisis, perhaps as the globalisation trend that has seen Eurozone manufacturers outsource production, has lost pace.
- Yet, this has not stopped productivity growth from slowing.
- **Thinking back to the table I showed you earlier in this presentation**, it has not *just* been the service

sector that has seen a slowdown in productivity growth.

- **Given this, sectoral changes in the economy's make-up cannot explain the persistent weakness of productivity growth in the Eurozone since the global financial crisis.**

## Demographics (slide 12)

- **The growing share of older workers in the labour force has also been blamed for the slowdown in productivity growth.**
- Since 2000, the share of workers aged over 55 has risen sharply, to just over 17% while those aged 25-54 has fallen sharply (as you can see clearly in this **Chart**).
- A substantial body of literature has built up on this subject, much of it suggesting that productivity starts declining beyond the age of about 50 as older workers' stock of skills becomes dated and they (we) have difficulty in adapting to, or adopting new technologies, affecting the quality of labour.
- (*"Implications of Population Ageing for the Labour Market"* – Sylvia Dixon, *Labour Market Trends 2003*).
- Meanwhile, more physical jobs are also likely to see a decline in productivity among older workers.
- Of course, this is simplistic. Age is less of a problem in the now dominant service sector, where the accumulation of knowledge is rated more highly than it is for jobs in the manufacturing or construction sectors.

- That being said, The ageing of the Eurozone's workforce has coincided with the slowdown in productivity growth, suggesting that it has played at least *some* part.
- While not all Eurozone countries have been affected, in those where the ageing process is more advanced, such as Germany, the Netherlands and especially Italy, it has probably had more of an effect.

## Technology (slide 13)

- **Another potential culprit for the slowdown in productivity growth is the decline in the rate of technological progress.**
- It has been argued that recent sectoral innovations are not the “game changers” that previous innovations were (more incremental than revolutionary).
- Indeed, some think that the boost from technology has already been exhausted.
- However, given the IT revolution boosted productivity in the Eurozone by less than in the US, it seems unlikely that its fading impact is entirely responsible for the significant slowdown in regional productivity growth.
- Moreover, there has been no apparent drop-off in R&D. Spending has held up as a share of regional GDP through the crisis period (**see Chart**).
- This does not just reflect a greater role played by the Zone’s governments. R&D spending by business also increased.
- **And**, the number of researchers involved in R&D has also risen over the past decade.

## Slower technology diffusion (slide 14)

- **A more convincing explanation for the productivity slowdown is that the pace of technological *diffusion* has slowed.**
- While a few, highly innovative, firms pushed ahead, most have not yet incorporated new technologies (such as AI) into their processes. They are therefore not yet reaping any productivity benefits.
- As the two charts on this page show, there exists a big gap in productivity between the most innovative (frontier) OECD firms and the non-frontier firms operating in the Eurozone.
- **The fact that this gap has widened since 2003 suggests that the rate of technology diffusion is actually getting *slower* in the Eurozone, as the region's service sector firms lag further behind those elsewhere.**

## What does the ECB think? (slide 15)

- The ECB has suggested that this might reflect lower investment by Eurozone non-frontier firms in human capital and intangible investments such as R&D and intellectual property.
- It may also, thinks the central bank, reflect a continuing prevalence of so-called “zombie” firms.
- With credit hard to come by, firms may have been unable to reallocate their resources from less productive to more productive activities.
- The long period of ultra-low interest rates may have allowed firms that would otherwise go bust to survive.
- All this has contributed to a decline in the rate of “business churn” (the so-called creative destruction implicit in a successful capitalist economy).
- This may have depressed productivity growth as the absence of new entrants reduces the pressure on existing firms to innovate.

## What about the World Bank's view (slide 16)

- The World Bank takes the view that high barriers to entry and implicit and explicit product market restrictions makes the Eurozone particularly susceptible to the slowdown in business churn.
- According to the World Bank's "*Ease of Doing Business Index*" (**see chart for conclusions**) Eurozone countries generally continue to rank below the US, especially in Italy.
- **In summary, then, one might suspect that of the potential structural explanations, poor technological diffusion and demographic trends best explain the slowdown in Eurozone labour productivity growth.**
- These forces are not unique to the Zone, but demographic conditions are worse in the Eurozone than in the US and the slower response of regional firms (on the whole) to new technologies than their US counterparts helps to explain why the region was hit harder by these structural headwinds than was the US.
- **These structural factors were accentuated by cyclical factors during the 2008-09 downturn and the sluggishness of the recovery thereafter.**

## The Outlook for productivity growth (slide 17)

- So, given all this, what is the outlook for productivity growth in the Eurozone?
- The key question in this regard is whether productivity growth will remain sluggish or if there is scope for a pick-up?
- To answer this, it is worth looking at the composition of labour productivity growth.
- Specifically:
  - The contribution from capital
  - The quality of the labour force (including education levels)
  - Total factor productivity (which reflects how efficiently labour and capital are combined to generate output).
- This is the residual part of productivity growth that cannot be explained by measured changes in labour and capital inputs and is affected by factors such as technological efficiency, innovation and the regulatory environment.
- I shall examine these three determinants of productivity growth in turn...

## **1. Capital intensity (slide 18)**

- Capacity utilisation of Eurozone industrial firms has been rising since 2013.
- Firms are reporting that they are, on average, operating at over 84% capacity over Q1 2018, slightly above the pre-crisis period regional activity.
- **This implies that firms are now operating at a fairly normal level of capacity and that to meet growing demand they will have to increase their capital investment.**

## Machinery investment growth picking up (slide 19)

- **Some cyclical increase in investment does seem likely.**
- On balance, more firms are reporting that a lack of equipment is limiting their production than they did on average between 1999 and 2007.
- What's more, firms appear to be putting their money where their mouths are. The ECB's latest Bank Lending Survey shows an increase in firms' demand for loans to fund fixed investment. **(see slide).**
- This points to annual machinery investment growth across the region picking up strongly from Q4 2017's 6.2% to possibly around 8%.

## Capital deepening is AWOL (slide 20)

- Over the past couple of years (**as this chart shows**) there has been a complete absence of “capital deepening”.
- By this I mean an increase in the amount of capital available *per worker*.
- While the capital stock has increased, employment has risen by more, reducing the amount of capital per worker.
- Nonetheless, with investment set to pick up from its current depressed levels and employment growth likely to slow, there is reason to think that the capital stock per worker will increase more substantially in the future.
- **Giving each worker more capital to work with should boost output per hour in the future.**

## **2. Labour quality (slide 21)**

- **The outlook is less positive for labour quality.**
- Admittedly, there might be scope for a boost in the short-term.
- Rigid labour laws, which have arguably kept older, less productive workers in employment while preventing younger ones from entering the workforce, are being relaxed in parts of the Eurozone, such as Italy and France.
- And, Eurozone governments are putting in place measures to bolster participation in training and apprenticeships.
- For example, over the next four years, the French government plans to provide training for an additional 2m low-skilled unemployed people and steer them towards employment.
- And the Spanish government aims to provide financial support for young people on apprenticeship and training contracts.

## Medium-term concerns (slide 22)

- However, as the labour market tightens, the *quality* of the remaining pool of workers will deteriorate as the most highly skilled find jobs first.
- So, as the economy strengthens and unemployment falls, firms will eventually have to hire workers with fewer skills, reducing the average quality of the workforce.
- The **chart** attempts to show this.
- Importantly, there appears only limited scope for a sustained improvement in the overall skills base of the region's workforce.
- Educational attainment among 15-year olds (measured using the average of internationally comparable test scores in maths, reading and science (PISA scores) has actually fallen a bit since 2006 and is low compared to most other major advanced economies...as the **chart shows**.
- Furthermore, the evidence is showing that training programmes have a mixed success rate.
- In Spain, for example, participation by the long-term unemployed in government funded training programmes has been very poor.

- And (as previously pointed out) evidence suggests that older workers are generally likely to be less productive and less receptive to taking on new ideas.
- **The IMF estimates that, in the absence of the impact of ageing, productivity growth could be higher by around 25% over the next two decades**
- Some of the worst affected Eurozone member states will be the region's peripheral countries.

### **3. Total Factor Productivity (slide 23)**

- **Here there are reasons for considerable pessimism.**
- Although there has been some progress in reducing the degree of product market regulation, Eurozone economies are still subject to barriers to entry.
- For example, **according to the World Bank**, it takes a Eurozone firm on average 9 days to start a business, compared to 6 days in the US and 4.5 days in the UK.
- These allow inefficient and unproductive incumbents to remain, holding back productivity growth.
- Meanwhile, some more recent technological innovations (such as driverless vehicles and artificial intelligence) are unlikely to become widespread for some time.
- After all, it took a long time for previous innovations to have their full effect and there may be few reasons to believe that there should not be a lag for these ones as well.
- Moreover, given that Eurozone firms appear reluctant to adopt new technologies, one should be sceptical that productivity growth might rebound sharply over the next few

years (**cf charts 9 & 10 earlier in the presentation**).

- One should therefore be cautious about relaying on technological improvements alone to drive a sudden jump in productivity growth any time soon...although over the longer term there may be some grounds for greater optimism.

## **Putting this together then structural impediments to productivity growth seem likely to continue (slide 25)**

- As this table shows, one should expect only a small increase in capital deepening over the coming years as firms increase investment.
- But, an ageing workforce will see the quality of labour deteriorate over this same period.
- Meanwhile, total factor productivity growth is likely to be little changed.
- In total, annual labour productivity growth is likely to settle at around 1.0% over the medium-term, which would be a bit slower than the average 1.5% recorded in the decade before the crisis.

## Implications and conclusion (slide 26)

- **The outlook for productivity growth is particularly important at the moment given the concern that strong GDP growth and a tightening labour market might prompt a sudden surge in inflation.**
- That would force central banks to slam the brakes on with a sharp rise in interest rates that would surely put an end to the economy's expansion.
- Stronger productivity growth would help to extricate central banks from this predicament. With more output being produced for less effort (in terms of hours worked), firms should be able to absorb an equivalent pick-up in nominal wage growth without needing to increase prices as *unit* labour costs would be unchanged.
- Admittedly (as I have outlined in this presentation), one should not expect much of a pick-up in productivity growth over the coming years as it is held down by structural forces.
- **But neither should one forecast a surge in nominal wage growth, even as labour market conditions continue their gradual improvement.**
- For a start, while wage pressures are building in Germany, there is still plenty of labour market slack in many other member states that will

dampen aggregate Eurozone wage growth for some time to come.

- Furthermore, one might suspect that the erosion of workers' bargaining power is likely to continue, especially in the Eurozone where it has been preserved for much longer than in the US or the UK (for example).
- **For these reasons, one should not expect a sharp pick-up in nominal annual wage growth over the coming years, perhaps from around 2% in 2017 to about 3%.**
- Along with the small pick-up in productivity growth, this implies that there will not be a sharp rise in unit labour costs that will prompt firms to raise their prices and cause inflation to surge.
- **With inflation set to remain fairly low, the ECB can proceed with its planned very gradual normalisation of monetary policy, thereby keeping the region's economic expansion alive.**
- **Yet, with productivity growth set to be softer than pre-crisis standards and labour force growth limited by a reduction in the working age population, the Eurozone economy's trend GDP growth rate is likely to remain fairly sluggish, at around just 1.2% points.**

