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Is Europe's Productivity Glass Half Full or Half Empty?

The global economic and financial crisis left the European economy in dire straits for almost a decade between 2008 and 2016. Despite the recent growth strengthening, which has brought average GDP growth rates for the euro area and the EU as a whole about back to their pre-crisis levels, it is too early to speak of a structural growth resurgence. Unemployment is still relatively high, and there are still sizeable output gaps as well as labour slack in several European economies. Moreover, one of the most important structural performance indicators, productivity, is barely on the path of recovery. At the macroeconomic level, labour productivity growth in the euro area was just one per cent in 2017 and a touch higher for the EU28 (1.2%), thanks to the better performing Central and Eastern European economies. Today's growth rates are still only about half of the labour productivity growth rates in the two decades before the financial crisis, and only a third of the growth rates in the 1970s and 1980s (see Figure 1). What is more, growth rates of total factor productivity (TFP) – a more refined productivity measure which measures output growth over combined labour and capital inputs – are still in the low tenths of a percentage point, and they show no decisive signs of recovery yet.

Nonetheless, while the recovery could indeed turn out to be short-lived, it would be unwise to ignore the recent uptick in productivity growth and simply treat it as a statistical glitch. Productivity typically strengthens in an expansionary phase of the business cycle, because employers wait to hire more workers until they are certain about the economic recovery taking hold. With no recession in sight in the short term, greater investment in machinery and equipment, as well as other business spending on innovation and automation, may raise productivity further and help pay for higher wages, as labour markets are beginning to tighten.

In this paper, we take a careful look at what is driving the productivity recovery and in which parts of the economy it is occurring. We analyse the productivity trend and annual performance since the financial crisis from multiple perspectives and using different datasets:

- First, we analyse the latest estimates of labour productivity growth from The Conference Board Total Economy Database (TED). This dataset covers estimates of labour productivity and total factor productivity for 123 countries, including all EU28 economies.[1]

- Second, TED constitutes the basis for The Conference Board Global Economic Outlook, which provides one-, five- and ten-year projections for growth of GDP, labour force, capital and TFP for 65 economies, including most EU member states. The projections are based on a supply-side growth accounting model in which, among other measures, TFP growth is econometrically estimated using a wide range of related variables during past periods.[2]

- Third, we take a look at measures of sectoral productivity, using the latest update of the EU KLEMS Growth and Productivity Accounts for 12 major European countries through 2015.[3]

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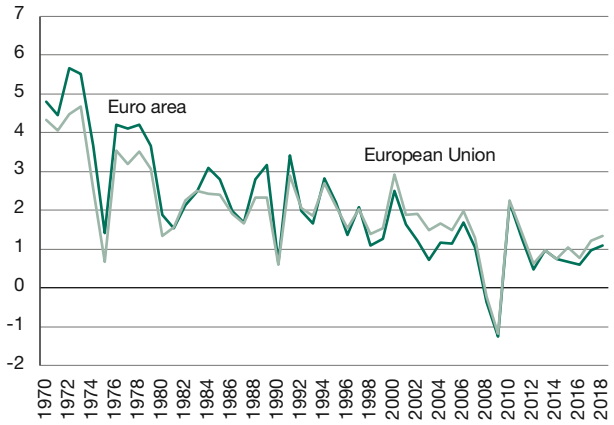
1 Data is available from http://www.conference-board.org/data/economydatabase/. The estimates presented in this paper are from the latest March 2018 release, which includes forecasts for 2018.

2 See The Conference Board: Global Economic Outlook, available at https://www.conference-board.org/data/globaloutlook/; and A.A. Erumban, K. de Vries: Global Growth Projections for The Conference Board Global Economic Outlook 2018, The Conference Board Economics Program Working Paper Series, EPWP #17-02, 2017.

3 See http://www.euklems.net; and B. van Ark, K. Jäger: Recent Trends in Europe's Output and Productivity Growth Performance at the Sector Level, 2002-2015, International Productivity Monitor No. 33, Fall 2017, pp. 8-23. The latest EU KLEMS release brings the accounts for most of the countries up to 2015 and provides them on the basis of the new European System of Accounts (ESA 2010) and the NACE 2 industry classification.

Figure 1
Growth of GDP per hour worked in the euro area and the EU28, 1970-2017
Annual average change, in %



Note: Euro area and European Union represent current membership, applied to the whole period 1970-2018.

Source: The Conference Board Total Economy Database™, March 2018.

Table 1
Growth of GDP per hour worked, selected mature economies, 2000-2018
Annual average change, in %

	All mature economies	Euro area	EU28	France	Germany	Italy	Spain	United Kingdom	United States
2000-2007	2.2	1.4	1.8	1.5	1.7	0.4	0.4	2.1	2.5
2008-2015	1.1	0.6	0.7	0.5	0.6	0.1	1.3	0.1	1.3
2015	0.9	0.7	1.0	0.8	0.5	0.2	0.4	0.8	0.9
2016	0.7	0.6	0.8	1.0	1.2	-0.8	0.6	0.6	0.3
2017	1.1	1.0	1.2	0.2	1.4	0.5	1.3	0.6	1.0
2018 (forecast)	1.3	1.1	1.3	1.2	1.4	0.5	1.0	0.8	1.3

Notes: Growth rates are based on the annual percentage of difference of each variable and are aggregated using shares in nominal PPP converted GDP. Growth rates for 2000-2007 and 2008-2015 are the averages of yearly growth rates.

Source: The Conference Board Total Economy Database™, March 2018.

We find that the declining rate of labour productivity growth in most European countries has bottomed out in recent years. However, labour productivity growth rates have not fully recovered to pre-crisis levels. While TFP growth rates are obviously lower, as they adjust for capital deepening effects, the recovery in TFP growth relative to pre-crisis levels looks somewhat stronger, especially in the market services sector of the economy. Looking forward, TFP growth is projected to continue or even slightly improve from its current growth momentum in the coming decade, due to increases in human capital, digitisation and the realisation of further catch-up potential, especially in Central and Eastern Europe.

Labour productivity growth

Labour productivity growth, measured as GDP per hour worked, increased by 0.4 percentage points to one per cent in the euro area in 2017 and is projected to marginally improve to 1.1% in 2018 (Table 1). The figures for the European Union are slightly higher, at 1.2% for 2017 and 1.3% for 2018. While these productivity growth rates are not spectacular increases in themselves, they do present a clear break with previous years, when the growth rates were more in the range of 0.6-0.7%. However, labour productivity growth has not yet returned to the average annual rate of 2000-2007, i.e. the period between the adoption of the single currency and the global financial crisis. Labour productivity growth then averaged 1.4% for the euro area and 1.8% for the EU as a whole; thus, only about half of the shortfall has now been made up for.

In 2017, most of the improvement in labour productivity in the euro area and the EU28 was driven by an improvement in GDP growth, while the recovery of total working hours has continued to lag. This is characteristic of the pro-cyclical nature of the productivity recovery. However, the projections for 2018 show that productivity growth will hold up despite a moderation in both GDP and employment growth. This could point at the possibility that productivity growth might have recovered at least partially to a higher structural level.

The productivity recovery is still far from homogeneous across Europe, and diversity among countries is projected to persist in 2018. Among the large economies, France is the only country which may still significantly improve its productivity growth rate in 2018, in part because 2017 was a weak year to begin with. Germany and Italy are expected to see rates similar to those in 2017, at 1.4% and 0.5% respectively. Spain may see its productivity growth rate deteriorate somewhat versus 2017, though it should remain decent at 1.0%. As in previous years, the highest rates of productivity improvements are found in Central and Eastern European countries, where productivity levels are still only about half of those in Western Europe.

This is also the main reason why productivity growth rates are higher for the broader European Union aggregate, with several Eastern European countries, including Poland, Romania, Hungary and Bulgaria, clocking in productivity growth well in excess of three per cent. But those economies will need to maintain this pace for some time to achieve the promise of convergence towards Western European productivity levels.

A notable exception to the picture sketched above is the United Kingdom, which has delivered weak productivity performance for most of the post-recession period. In recent years, growth in GDP per hour worked has not managed to break out of the 0.5-1.0% band, well below its performance during the decade leading up to the global financial crisis. There is also no real productivity improvement in the UK foreseen for 2018. The timing of the business cycle in the UK is different from that on the European continent, which started its current expansionary phase in earnest in the second half of 2013, whereas the UK economy seems to have peaked around 2015. Much of Britain's post-recession recovery has been due to the strong performance of the labour market, but there are many indications that low-productivity firms, especially in the services sector of the economy, have been responsible for the employment-driven post-recession recovery.[4]

The improved productivity growth rates for Europe in 2017 and 2018 are no exception compared to other mature economies. Most notably, the US is also estimated to improve its productivity faster in 2017 and 2018 than was the case in previous years. Mature economies in East Asia, other than Japan, are expected to continue to see solid productivity growth rates between two and three per cent. Despite these ongoing improvements, the productivity growth rates in mature economies need to strengthen a lot more to escape the anaemic rates seen since about 2005. Consider the world's largest economy, the US, which is forecasted to see growth in GDP per hour worked of 1.3% in 2018. This is up from 1.0% in 2017, but still only half the rate seen in the 2000-2007 period. In this regard, European economies are doing better, as they are nearly back to pre-crisis productivity growth rates, even though Europe's pre-crisis performance was relatively weak compared to other mature economies.

TFP growth and growth projections

Total factor productivity is a more accurate measure of productivity, as it teases out the effects of increased use of machines and other capital and workforce skills from labour productivity. As such, TFP growth refers to the spillovers from technology and innovation which raise the efficiency with which the factor inputs labour and capital are utilised in the production process. At a micro level, TFP is also an important measure of business dynamism, as it determines whether individual companies will survive in the long run.[5]

TFP growth has been the Achilles' heel of Europe's productivity problem since the 1990s.[6] With the onset of the global financial crisis, TFP dropped drastically, with overall losses in the range of five to ten per cent, depending on the country. Germany, France and the Netherlands were especially hard hit, while the decline in TFP had already set in around the mid-1990s in Spain and Italy. During the post-recession period, euro area TFP growth has stagnated, but it recently saw some modest signs of recovery in the range of 0.2-0.3% per year.

Somewhat surprisingly though, TFP projections from The Conference Board Global Economic Outlook model suggest that the recent modest positive trajectory of TFP growth in the euro area will extend into the next decade, eventually reaching a more healthy annual average growth rate of about 0.5% in 2018-2027 (see Figure 2). However, there are differences between countries, ranging from 0.2% in Italy to 0.6% in Germany. What underlying factors explain the improvement relative to the recent decades of TFP slowdown? Total factor productivity projections are especially sensitive based on their specifications, but the analysis tells a clear story:

- Human capital (measured by the Human Development Index) and innovation (proxied by R&D) have the largest effects in determining TFP growth.

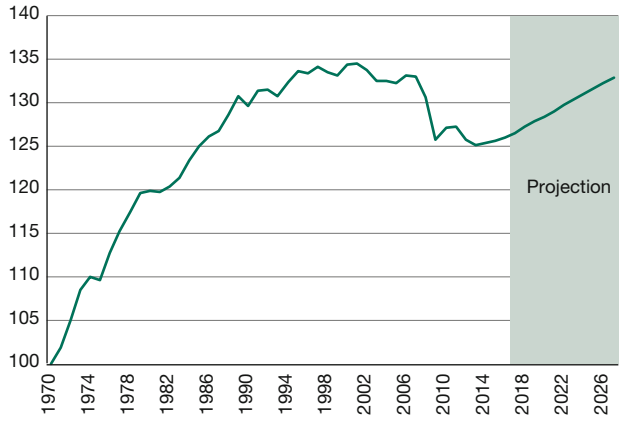
- A measure of investments in information and communication technology (ICT) points to positive effects from digitisation, though the impact on future TFP growth is relatively small. This may indicate that ICT investment is not a strong contributor to TFP growth in and of itself, because it mostly interacts with other aspects of digitisation, including labour force skills and other business spending on ICT services quality and innovation.

4 See Office for National Statistics: Labour Productivity Statistical Bulletin, 5 January 2018.

5 D. Andrews, C. Criscuolo, P.N. Gal: The Best versus the Rest. The Global Productivity Slowdown, Divergence across Firms and the Role of Public Policy, OECD Economic Policy Papers, December 2016.

6 B. van Ark, M. O'Mahony, M. Timmer: The Productivity Gap between Europe and the U.S.: Trends and Causes, in: Journal of Economic Perspectives, Vol. 22, No. 1, 2008, pp. 25-44.

Figure 2
TFP growth in the euro area, 1970-2017 and projections for 2018-2027
Index: 1970=100



Sources: 1970-2016 based on the November 2017 release of The Conference Board Total Economy Database™ (adjusted version); projections for 2017-2027 based on The Conference Board Global Economic Outlook 2018.

- Countries with lower levels of labour productivity, for example in Southern Europe and Central and Eastern Europe, may still benefit from a potential to catch up with the leading countries.

In addition, slowing labour supply growth over the next decade due to ageing of the workforce could also raise the capital intensity of the production process through automation and thus raise labour productivity. Some argue that the effects of the current wave of digital transformation will become apparent in an uptick in the productivity statistics in the coming years.[7] Sceptics, on the other hand, can point to the sluggish performance of the past 20 years or so, or the slow-moving agenda on the European single market for services.

Industry level performance

Detailed analysis of productivity performance at the industry level shows that different sectors across the euro area have responded differently to the global financial crisis and the recent European recession. In particular, the latest update of EU KLEMS industry-level growth accounts for 12 EU economies through 2015 shows a different pace of recovery in the manufacturing sector vis-à-vis the market services sector (which excludes health care, education and government services).[8]

The manufacturing sector was particularly hard hit by the crisis. Following two back-to-back recessions, one might have expected a pro-cyclical productivity recovery to mostly benefit the manufacturing sector, but by 2015 it had only partially recovered. While average manufacturing labour productivity growth for the EU12 recovered to 1.4% on average in 2011-2015 (see Table 2), this was still barely more than a third of the pre-crisis growth of 3.7% (2002-2007). Total factor productivity growth also only recovered to a modest 0.9% from 2011-2015, again just a third of the pre-crisis growth rate. Since 2016, however, a further improvement in manufacturing productivity has occurred. Recent estimates of manufacturing labour productivity from the International Labour Comparisons programme at The Conference Board show that growth rates for 2016 were about the same as in 2011-2015, namely 1.5%.[9]

In the services sector of the economy, one normally expects productivity to recover more slowly than in manufacturing. Service sector firms are often tempted to first boost (often lower-skilled) employment in response to rising demand, as service productivity growth is usually harder to achieve in the short term. Despite the faster recovery of employment in the market services sector, labour productivity growth recovered to two-thirds of the pre-crisis level (0.9% in 2011-2015 versus 1.4% in 2002-2007) and TFP growth made it almost back to the pre-crisis level (0.4% in 2011-2015 versus 0.5% in 2002-2007). While market services productivity growth remains slower than in manufacturing, the recovery is significant given the growing size of the market services sector in the economy, especially as a shrinking manufacturing sector is structurally unavoidable in a wealthy society. Also, the recovery in intangible capital (such as knowledge and managerial capital) in market services, which suffered a slowdown during the crisis but has seen some recovery

7 E. Brynjolfsson, A. McAfee: The Second Machine Age, New York 2014, W.W. Norton & Company.

8 The 12 EU economies included are Austria, Belgium, the Czech Republic, Denmark, Germany, Finland, France, Italy, the Netherlands, Spain, Sweden and the United Kingdom. Manufacturing and market services together make up an average of 58% of aggregate (or total) economy nominal GDP for the 12 countries between 2010 and 2015 in the dataset; the primary sector (agriculture and mining), utilities, construction, and the public sector are excluded. The health care and the education sectors are entirely excluded from market services, as most organisations in those sectors are government-owned or largely government-funded.

9 The Conference Board: International Comparisons of Manufacturing Productivity and Unit Labour Costs Trends, The Conference Board International Labour Comparisons, 2017.

Table 2
Labour productivity and TFP in Europe in manufacturing and market services, 2002-2015
Average annual rate of change, in %

		Manufacturing	Market services
EU12			
Labour productivity (value added per hour)	2002-2007	3.7	1.4
	2008-2010	0.7	-0.5
	2011-2015	1.4	0.9
Total factor productivity	2002-2007	2.4	0.5
	2008-2010	-1.0	-1.5
	2011-2015	0.9	0.4

Notes: Figures refer to the value-added-weighted average of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Italy, the Netherlands, Spain, Sweden and the United Kingdom. 2015 figures exclude Italy, the Czech Republic and Sweden.

Source: EU KLEMS 2017 release.

more recently, may have further contributed to the recovery of TFP growth in market services.[10]

Is the productivity glass half full or half empty?

This paper shows that on the basis of the most recent estimates, it is clearly too early to call victory over the slow productivity trend in Europe of the past decade. Many recent studies have explored why productivity in advanced economies has slowed so much and so persistently.[11] The risks of secular stagnation are still looming, driven by weak population growth and an ageing workforce in mature economies – and further exacerbated by a backlash against immigration. Combined with continued weak inflation, these developments will not be positive for innovation and productivity growth.

While we should avoid overhyping the productivity recovery, another risk is that the headline numbers may underwhelm us and we might consequently miss what is happening under the hood. Technology and especially digitisation have led to inflated early expectations of faster productivity growth. While new digital technologies have rapidly diffused across the economy, their absorption and translation into better business performance has been quite slow and uneven. This is not an unusual phenomenon. Harberger speaks of two types of growth.[12] One is characterised as "mushroom" growth, in which a limited number of sectors, industries or firms deliver much better productivity performance than others. During this phase, exciting prospects about the productivity effects of driverless cars, robotics and artificial intelligence easily cause us to exaggerate the macro productivity impact of mushroom growth. The second type of growth is what Harberger calls "yeasty" growth, when the productivity improvements spread more widely across the economy. Even though we may not yet be fully harvesting the yeast effects, accelerated investment and business spending on cloud and digital services across many industries, rising wage premiums on skilled labour and stronger demand bode well for the broader emergence of automation and digitisation.

What do the improved productivity growth estimates for 2017 and 2018 in the euro area mean for its long-term trend? The productivity slowdown has garnered much attention in recent years, not least in European policy circles.[13] The time factor does play an important role. Perez speaks of an "installation phase" versus a "deployment phase" of a new technological paradigm.[14] During the installation phase, new business spending on machinery, innovation, and organisational and management changes exceeds the overall output recovery. During this phase, the famous Schumpeter credo of "creative destruction" may put more emphasis on creation than on destruction, and hence low-productivity firms can survive – especially in the past decade's environment of low interest rates, credit growth and weak wage growth, in which cheap workers could still be relied upon.[15] During the transition to the deployment phase, in which new technology spreads more widely and generates more productivity across the economy, the "destruction" of low-productiv-

10 For an exposition on the spillovers from intangible capital to TFP growth, see J. Haskel, S. Westlake: Capitalism Without Capital: The Rise of the Intangible Economy, Princeton 2017, Princeton University Press.

11 J. Remes, J. Manyika, J. Bughin, J. Woetzel, J. Mischke, M. Krishnan: Solving the Productivity Puzzle: The Role of Demand and the Promise of Digitization, McKinsey Global Institute, February 2018; D.M. Byrne, J.G. Fernald, M.B. Reinsdorf: Does the United States Have a Productivity Slowdown or a Measurement Problem?, Federal Reserve Bank of San Francisco Working Paper No. 2016-03, 2016; C. Syverson: Challenges to Mismeasurement Explanations for the U.S. Productivity Slowdown, NBER Working Paper No. 21974, 2016.

12 A. Harberger: A Vision of the Growth Process, in: American Economic Review, Vol. 88, No. 1, 1998, pp. 1-32.

13 M. Draghi: The productivity challenge for Europe, Lectio magistralis, Madrid, 30 November 2016, available at https://www.ecb.europa.eu/press/key/date/2016/html/sp161130_1.en.html; A. Haldane: Productivity puzzles, speech, London, 20 March 2017, available at https://www.bankofengland.co.uk/speech/2017/productivity-puzzles.

14 C. Perez: Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages, Cheltenham 2002, Edward Elgar.

15 D. Andrews, M. Adalet McGowan, V. Millot: Confronting the zombies: Policies for productivity revival, OECD Economic Policy Paper No. 21, 2017.

ity activities could become quite disruptive, for example through a recession, which could trigger such an adjustment.

Whether the productivity glass is half full or half empty depends on what it is filled with. As rising labour and talent shortages become increasingly pressing, productivity growth will become the only way to raise potential growth back up to higher levels. Companies are likely to accelerate digitisation while transforming the higher skill premiums for talented workers into a return through higher productivity.