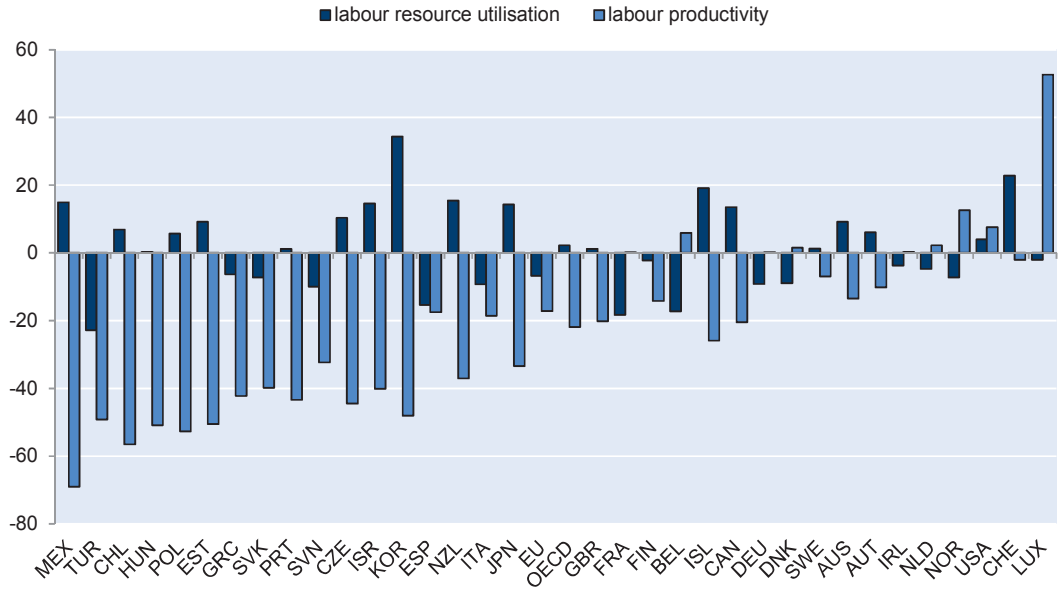
Editorial

Paul Krugman noted in 1994: "productivity isn't everything, but in the long run it is almost everything". Productivity is about "working smarter", rather than "working harder". It reflects our ability to produce more output by better combining inputs, owing to new ideas, technological innovations and business models. Innovations such as the steam engine, electrification and digitisation have led to radical changes in the production of goods and services, raising living standards and well-being. Indeed, the large differences in income per capita observed across countries mostly reflect differences in labour productivity (Figure I.1). At the same time, productivity is expected to be the main driver of economic growth and well-being over the next 50 years, via investment in innovation and knowledge-based capital. Thus, it is of little surprise that the recent productivity slowdown has sparked widespread interest, with the debate centring on the extent to which the productivity slowdown is temporary, or a sign of more permanent things to come.

Figure 1. **Large differences in income per capita mostly reflect labour productivity gaps, 2013**

Percentage difference in labour resource utilisation and labour productivity compared with the upper half of OECD countries[1]



1. Gross Domestic Product (GDP) per capita can be decomposed into the contributions of labour productivity (GDP per hour worked) and labour resource utilisation (total number of hours worked per capita). The sum of the percentage difference in labour resource utilisation and labour productivity do not add up exactly to the GDP per capita difference since the decomposition is multiplicative. Compared to the simple average of the 17 OECD countries with highest GDP per capita in 2013 based on 2013 purchasing power parities (PPPs).

Source: OECD (2015), http://dx.doi.org/10.1787/growth-2015-en.

The sources of future productivity growth

Indeed, the future of productivity is highly uncertain and the debate has manifested itself in two polar views. There is a pessimistic view, reflected in some of the work of Robert Gordon, which holds that the recent slowdown is a permanent phenomenon and that the types of innovations that took place in the first half of the 20th century (e.g. electrification) are far more significant than anything that has taken place since then (e.g. Information and Communication Technologies [ICTs]), or indeed, likely to transpire in the future. Future economic growth will also slow further, owing to a number of headwinds related to demography, education, inequality, globalisation, environment and debt. By contrast, others, such as Brynjolfsson and McAfee, take a more optimistic view and argue that the underlying rate of technological progress has not slowed and that the IT revolution will continue to dramatically transform frontier economies.

Given this uncertainty, countries should look to tap sources of productivity growth where there is potentially large and sure scope for improvement over the short to medium term. The Future of Productivity illustrates that the main source of the productivity slowdown is not so much a slowing of innovation by the most globally advanced firms, but rather a slowing of the pace at which innovations spread throughout the economy: a breakdown of the diffusion machine. Indeed, a striking fact to emerge is that the productivity growth of the globally most productive firms remained robust in the 21st century but the gap between those high productivity firms and the rest has risen.

The strength of global frontier firms reflects their capacity to "innovate" and to optimally combine technological, organisational and human capital in production processes throughout global value chains (GVCs) and harness the power of digitalisation to rapidly diffuse and replicate ideas.

The rising gap between frontier firms and the rest raises questions about the obstacles that prevent all firms from adopting seemingly well-known innovations. It also suggests that future growth will largely depend on reviving the diffusion machine, which propelled productivity growth for much of the 20th century, most notably in manufacturing. Raising the productivity of laggard firms, via diffusion, could also reduce the rise in wage inequality, given that the observed rise in wage inequality appears to reflect the increasing dispersion in average wages paid across firms.

Productivity diffusion is especially challenging in the services sector, partly due to low competitive pressures which blunt the incentives to adopt best practices. This partly reflects policy weaknesses and productivity problems in the services sector will become increasingly costly for two reasons. First, the weight of services in our economies will continue to rise. Second, it may hinder the effective functioning of GVCs since logistics, finance and communication are the oil that greases the wheels of globalisation.

Scope for diffusion depends on four key factors. First, global connections, via trade, foreign direct investment (FDI), participation in GVCs and the international mobility of skilled labour. Second, experimentation by firms – especially new entrants –with new ideas, technologies and business models. Third, the efficient reallocation of scarce resources to underpin the growth of innovative firms. Fourth, synergic investments in research and development (R&D), skills and organisational know-how – particularly managerial capital – that enable economies to absorb, adapt and reap the full benefits of new technologies. But OECD countries differ significantly in these four areas, implying that diffusion comes easier to firms in some economies rather than others.

Another crucial finding to emerge from our work is that the aggregate benefits of diffusion are magnified by a market environment that fosters the growth of the most productive firms. The larger are the more productive firms, the greater the extent to which their good performance gets reflected in overall economic growth. Unfortunately, in some economies, even though the most advanced firms can have productivity levels close to the global frontier, their aggregate impact is muted to the extent that they are under-sized. This suggests that there is much to be gained by reforms that make it easier for productive firms to attract the resources required to underpin their growth.

More specifically, The Future of Productivity demonstrates that there is much scope to boost productivity and reduce inequality simply by more effectively allocating human talent to jobs. Yet, the research in this book suggests that around one-quarter of workers report a mismatch between their skills and those required to do their job. A better use of talent could translate into significant labour productivity gains in many OECD countries.

In order to provide the evidence base needed for policy making in this area, the book adopts a holistic approach spanning traditional growth accounting and analysis of aggregate data to explore past growth performance (Chapter 1); long term economic projections to identify relevant issues for future productivity; and, especially, firm and industry level evidence on productivity growth and its determinants. Chapter 2 provides a framework for analysing the economic forces that shape productivity developments, while Chapter 3 identifies a set of structural themes relevant for future productivity. In this regard, future labour productivity growth will increasingly depend on a policy framework that: i) fosters innovation at the global frontier and reaps the benefits of globalisation by facilitating the diffusion of new technologies; ii) creates a market environment where the most productive firms are allowed to thrive, thus facilitating the more widespread penetration of available technologies; and iii) makes the most of human capital. In turn, Chapter 4 reviews evidence on how policies can boost productivity in these areas.

It is important to recognise that currently available firm-level data sources are not ideal, particularly for analysis of the productivity dynamics of laggard firms. In light of this, the book relies on a mix of critical review of existing evidence, descriptive analysis and when possible, firm level econometric analysis to try to provide insights, sometimes speculative, into some elements of the productivity puzzle (see Box 1.4 for an outline of the various empirical approaches). Nevertheless, it is reassuring that the results from policy analysis using incomplete firm level data are often confirmed by analysis using official industry level data. It is also possible to infer some aspects of the distribution of firm productivity within countries from recently collected OECD data on the distribution of firm size and age.

The final chapter offers some conclusions and identifies avenues for future research. Of course, there are a number of policy issues that while likely relevant for future productivity are not addressed for sake of brevity. These include the links between productivity and debt and inflation, infrastructure investment, including new forms of infrastructure, demographic change and immigration, corporate governance, and sectoral differences in the diffusion of technologies and innovation. These issues are beyond the scope of this book, but nonetheless represent potentially fruitful areas for future research.

A policy agenda to clear the path for higher productivity growth

So what can policy makers do to revive productivity growth? First, we need to keep pushing out the global innovation frontier. This requires significantly more public investment

in basic research to support the continued emergence of breakthrough innovations – such as the Internet, aerospace and antibiotics – which had their origins in public research. The worrying trend across the OECD is that governments, universities and firms are all investing less in basic research. Given the tight fiscal climate, reversing this trend will be easier if countries share the costs and risks of such research through stronger global collaboration. Pushing the frontier also requires enabling experimentation with radical new technologies and business models. Since innovation is about trial and error, failure needs to be recognised as an opportunity to learn and rebound, rather than being seen as the end of the game. Thus, the policy environment should enable successful firms to grow, but also let weak firms exit the market, so that scarce resources can be released to underpin the growth of the successful ones.

Second, we need to revive the "diffusion machine". This requires a policy framework that supports basic research and experimentation but also one that fosters the transmission of frontier knowledge to laggards and an efficient allocation of scarce resources. Pro-competition reforms to product markets, especially in services, are required to incentivise firms to adopt better technologies and business practices. This will also help reduce the costs and improve the quality of goods and services, which will boost the benefits of GVC participation. Closer collaboration between firms and universities is also needed to allow firms, especially smaller ones, to benefit from university connections with the global knowledge frontier and to provide them with access to research labs, knowledge and human talent. At the same time, a level playing field that does not favour incumbents over entrants is crucial, but this feature is often missing from many policies. For example, it is important that R&D tax incentives are designed so as to be equally accessible and beneficial to incumbent, young firms and start-ups. Finally, public investments in education and life-long learning are essential to ensure that workers have the capacity to learn new skills and adapt to changing technologies.

Third, policies that improve the allocation of scarce resources – labour, capital and skills – are crucial, to maximise knowledge diffusion and support productivity growth more generally. The primary reforms that promote firm growth are those that make product markets more competitive. Beyond that, reforms that reduce skill mismatch and the scarcity of risk capital are important to enable innovative firms to attract the skilled workers and capital they need to expand. For example, policies that lift impediments to labour mobility can help reduce skill bottlenecks. Bankruptcy laws that do not excessively penalise failure can also reduce skill and capital bottlenecks. High rates of skill mismatch often coincide with the presence of many small, old and unproductive firms that absorb valuable resources. However, it is crucial that young firms are able either to grow rapidly or exit. If they linger too long, resources are wasted. Finally, advanced early stage risk capital markets are key for the growth of young innovative firms, which would otherwise have difficulties securing finance, due to their lack of a track record.

The Future of Productivity reminds us that fostering innovation and promoting knowledge diffusion requires an environment where scarce resources, particularly human talent, flow to their best use. Reviving diffusion and improving resource allocation has the potential to not only sustain and accelerate productivity growth but also to make this growth more inclusive, by allowing more firms and workers to reap the benefits of the knowledge economy. To be sure, this reallocation process can also involve costs, but governments have the tools to minimise the disruption to workers, firms and society as a whole. They can do this via education and adult learning policies that make skills complementary to technical progress, while mechanisms to support displaced workers and insure workers against labour market risk more generally, such as well-designed

social safety nets and portable health and pension benefits, are vital. Only when these measures are implemented might future innovations translate into both higher productivity growth and an inclusive and less unequal society.

The OECD has been at the frontier of productivity research for many years – in fact, one of the first acts of the Organisation for European Economic Co-operation (OEEC), which administered the Marshall Plan, was to establish a Committee for Productivity and Applied Research. Accordingly, this book should not be viewed in isolation but instead as the latest offering in a rich and growing tradition of productivity research at the OECD.

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