The Rise of Pro-Productivity Institutions: A Review of Analysis and Policy Recommendations

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Date:
March 2023

The Productivity Institute
Productivity Insights Paper No.015

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Key words
Productivity, Productivity Commissions, Country Studies, Economic Growth, Productivity Policies

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Acknowledgements
This paper provides an overview of a large body of work by ten productivity commissions. Out of necessity, this has required a selection among the themes examined with only those considered most important covered in the paper. In most cases, the review covers the annual reports of European productivity commissions between 2019 and 2022. For Australia and New Zealand, where no annual reports are produced, the review covers key work on productivity conducted between 2017 and 2022. In some cases (e.g., Denmark, France, Germany and Portugal), the review draws partly on (official or non-official) translations of reports prepared in the national language. Comments by Bart van Ark on an earlier draft are highly appreciated, as are comments by Frances Ruane, David Hegarty, Chantal Kegels, Joost van der Linden and participants in seminars at TPI, the Austrian National Productivity Board, Arena Idé and the OECD. Any errors of substance or interpretation are mine.

Suggested citation

D.Pilat (2023) *The Rise of Pro-Productivity Institutions: A Review of Analysis and Policy Recommendations.* Productivity Insights Paper No. 015, The Productivity Institute.

The Productivity Institute is an organisation that works across academia, business and policy to better understand, measure and enable productivity across the UK. It is funded by the Economic and Social Research Council (grant number ES/V002740/1).

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Abstract

This paper reviews the recent analytical work and policy recommendations of ten national productivity commissions, i.e., Australia, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, New Zealand and Portugal, and makes some comparisons with the work of the UK Productivity Commission. The paper finds considerable diversity in the work of the productivity commissions, reflecting differences in mandates, degree of independence and available resources, amongst others. The boards have much more in common in their analytical and policy work. This likely reflects common challenges, such as the overall slowdown in productivity and the recent COVID-19 crisis; broader underlying trends affecting productivity such as digitalisation and structural change; as well as a shared understanding of the main drivers of productivity, notably investment, skills and human capital, as well as innovation, digitalisation and creative destruction.

The work by the UK Productivity Commission differs somewhat from that by the ten productivity boards. The UK Productivity Commission is essentially an independent, primarily academic effort linked to the work of The Productivity Institute, with a more indirect link to the UK government and policy making than the other commissions. Substantively, the work has much in common with that undertaken abroad, however, with many issues covered by foreign productivity commissions also addressed in the UK. Some differences emerge with the UK work thus far, however, with a greater focus on digitalisation, business dynamics and competition in the work of the foreign productivity commissions than in the UK. On the other hand, the UK Productivity Commission has thus far had a stronger focus on regional issues, governance and institutional factors than most of the foreign productivity commissions.

National contexts and priorities differ and what may be considered important in one country is not necessarily central to discussions in another. Comparing experiences with work in other countries can help provide context and generate ideas for further reflection in the work of the UK Productivity Commission and that of other commissions. The rise of productivity commissions across the OECD area provides a rich source of analysis and policy learning that should be drawn on by academics, policy makers and others interested in productivity.

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1. Introduction

The important role of productivity for economic performance has been recognised for many years. But it is only recently that many governments have decided to establish institutions focused on providing policy advice related to the pursuit of productivity growth, in the form of policy-oriented productivity commissions or productivity boards. Australia's Productivity Commission is the oldest and best established of these Commissions, officially created in 1998, although its history goes back further. From 2010 onwards, several other countries also established commissions, initially notably in Chile (2015), Denmark (2012), Mexico (2013), New Zealand (2010) and Norway (2014). Following a recommendation of the EU Council in September 2016, a growing number of EU countries also started to establish productivity boards, implying that there are currently some 20 productivity commissions in operation across the OECD area.[1] The UK Productivity Commission was established in September 2021, and is somewhat different than the others, as it was not established by government and has a more indirect link to government and policy making.

While the work of most of the productivity commissions started only recently, the wide-ranging body of work that is now emerging points to many drivers and policies that are generally considered to affect productivity. To inform the work of the UK Productivity Commission and work on productivity more generally, this paper reviews what productivity commissions have thus far found in their work, both as regards the drivers of productivity and the policies that can strengthen productivity. The paper focuses on ten countries that are likely to provide the greatest insights for the UK experience, i.e., Australia, Belgium, Denmark, Finland, France, Germany, Ireland, the Netherlands, New Zealand and Portugal.[2]

The paper is organised as follows. The next section briefly frames the policy debate on productivity and the role of productivity commissions. Section 3 briefly summarises some overall cross-country trends and patterns in productivity, thus providing some context for the discussion that follows. Sections 4 and 5 review what the various productivity commissions highlight as the drivers of productivity in their country, distinguishing between direct and indirect drivers and aims to identify some common patterns. They also review the policies that seek to influence these drivers and strengthen productivity. To assist the reader, sections 4 and 5 both include a short concluding section and overview table that summarises the findings. Section 6 summarises the overall findings of the paper and draws some broader conclusions, including by linking the findings of the paper to the ongoing work of the UK Productivity Commission.

[1] See https://economy-finance.ec.europa.eu/economic-and-fiscal-governance/national-productivity-boards_en

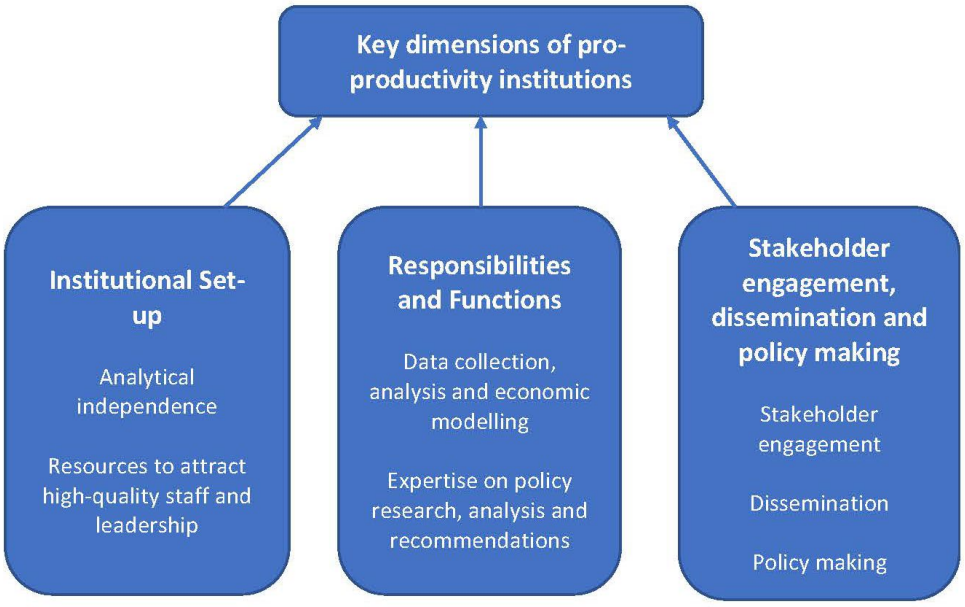
[2] Not all Eurozone and EU countries have established productivity boards, although Eurozone countries were invited to establish them, and non-Eurozone countries were encouraged to do so. Among Eurozone countries, Austria only established a board in 2022, while Estonia, Italy and Spain have not yet done so. Among non-Eurozone countries, only Denmark and Hungary have thus far established productivity boards. Outside the EU, Australia and New Zealand (since 2011) have well-established productivity commissions, as do Chile (since 2015) and Mexico (since 2013). Norway's productivity commission was only in operation over a short period, from 2014 to 2016. The UK Productivity Commission was established in 2021. See also Renda and Dougherty (2017).

2. The role of productivity boards and some framing

2.1 The role of productivity boards

In reading this paper, it is important to understand the role that productivity commissions play, and how this differs across countries. Broadly speaking, productivity commissions and boards have been set up to highlight the importance of productivity for economic performance, to explore the drivers of productivity and to provide policy guidance to governments.[3] As noted by Banks (2015): "*Policies that promote productivity can be difficult for governments to devise and even more difficult for them to successfully implement, given uneven political pressures and fragmented administrative structures. There is accordingly a strong case for establishing public institutions that not only help governments identify the right policies, but that can also counter one-sided political pressure against reform and help educate the community about what is at stake.*" The institutional set-up of commissions differs considerably across countries, however, affecting the role they can play. Some key features affecting their role are shown in Figure 1, drawing on a recent OECD review of Slovakia's National Productivity Board (OECD, 2022; Cavassini, et al., 2022).

Figure 1: Building blocks of the OECD's Analytical Framework



Source: OECD (2022) and Cavassini, et al. (2022).

This framework draws on earlier work to assess productivity boards (Renda and Dougherty, 2017) and what makes them effective (Banks, 2015). It considers three core elements, notably: a) institutional set-up, including analytical independence and available resources; b) responsibilities and functions of the board, including its expertise and analytical capacity; and

[3] Productivity-related institutions were also set up in several European countries in the context of the Marshall plan and were mostly aimed at providing technical advice to business on productivity. Several such institutions continue to operate in Asian countries, e.g., the Japan Productivity Centre, see: https://jpc.jpc-net.jp/eng/. Many of these institutions work together in the Asian Productivity Organization, see: https://www.apo-tokyo.org.

c) outreach, including engagement with stakeholders, dissemination and influence on policy making. As noted in the OECD work, the effectiveness of productivity boards does not only depend on these internal factors, but also on governments' commitment to support the board, and its capacity to review and implement any policy recommendations generated by the board (OECD, 2022; Cavassini, et al., 2022).

The productivity boards covered in this paper differ considerably across countries (Table 1). The Australian Productivity Commission is the largest organisation with a productivity-related mandate, but its main role is to carry out enquiries for the Australian parliament and government, only some of which are directly related to productivity. New Zealand's Productivity Commission serves a similar role although it has had a stronger focus on productivity over the past decade than Australia's. Both commissions undertake relatively long and deep productivity-related projects, however, and Australia's latest five-year review (Productivity Commission, 2022a) and New Zealand's recent review of frontier firms (New Zealand Productivity Commission, 2021) are by some margin the most comprehensive reports covered in this paper.

Some of the productivity boards in Europe have broader mandates and are built on already existing advisory councils, as in Denmark, Germany and Ireland. Ireland's National Competitiveness and Productivity Council only recently included the term "productivity" in its name and continues to have a broad focus on competitiveness-related issues, not all of which explicitly relate to productivity. And while Germany's Council of Economic Experts and Denmark's Economic Council both include one or more chapters on productivity in their annual report, they both have a pre-existing mandate that goes beyond productivity.

In yet other EU countries, such as Belgium and France, the boards are newly established, with a high level of independence enabling a role in both policy analysis and policy advice. And in a third group of EU countries, i.e., Finland, the Netherlands and Portugal, the boards are closely linked to existing government institutions and mainly providing analytical work.[4] With most boards in European countries only in operation since 2019, this situation may well continue to evolve.

An important difference can also be seen in the composition of the commissions. Some, as in France, Germany, and the UK, mainly consist of academics. Others, as in Denmark and Ireland also include representatives from business and trade unions. And yet others are mainly composed of government officials, e.g., in the Netherlands. These differences may affect the orientation of the work, e.g., the degree to which commissions respond to academic research, business-related concerns or government input. For example, Ireland's analysis of specific business costs (see section 5.2) may reflect the role that business plays in the board. Moreover, the reporting of the various boards differs. Australia's and New Zealand's boards also report to parliament, whereas most others only report to government. An interesting exception is Belgium's board, that also reports to trade unions and employer's organisations.

The variety in institutional arrangements shows that governments have taken different decisions on what the work of productivity commissions should entail and the advice they want to receive from these bodies. This variety in institutional arrangements could provide an interesting source for further policy learning.

[4] A useful overview of the work of EU boards was recently prepared by the European Commission (EC, 2022). That paper also provides further detail on the institutional arrangements of the EU national productivity boards.

Table 1: Overview of the Productivity Boards Reviewed in this Paper

Institution	Established	Type of Institution	Mission	Location
Australia Productivity Commission	1998	Standing inquiry body	Promoting productivity-enhancing reforms	Independent, reports to executive and Parliament
Belgium National Productivity Board	2019	Independent advisory body	Examine development of productivity and competitiveness	Independent structure, reports to trade unions and employer's organisations
Danish Economic Council	2017*	Independent advisory body (multi-stakeholder)	To analyse productivity and competitiveness	Independent, provides advice to Danish policy makers
Finnish Productivity Board	2021**	Independent expert body	Monitor productivity and competitiveness & conduct independent evaluations	Independent expert body linked to Ministry of Finance, reports to government
French National Productivity Council	2018**	Independent advisory body of academic economists	Analyse productivity and competitiveness and policies that affect them	Independent, non-partisan advisory body reporting to the Prime Minister and Minister of Finance.
German Council of Economic Experts	2019*	Independent academic advisory body	Analyse developments in the field of productivity and competitiveness	Independent, provides advice to German policy makers
Ireland National Competitiveness and Productivity Council	2018*	Independent council established by government (multi-stakeholder)	Analyse policy and developments in the field of productivity and competitiveness	Independent council, reports to prime minister and government
Netherlands Productivity Board	2017**	Independent economic research agency	Gain understanding of driving forces and impeding factors of productivity growth	Independent agency, part of Ministry of Economic Affairs and Climate Policy
New Zealand Productivity Commission	2011	Standing inquiry body	Improved wellbeing, improved productivity	Independent, reports to Parliament
Portugal Productivity Council	2018**	Joint temporary structure	Monitoring public policies in the field of productivity and support discussion on the subject	Joint economic structure of Ministry of Finance and Ministry of Economy
United Kingdom Productivity Commission	2021	Independent body, established by NIESR and The Productivity Institute	Understand research and evidence related to productivity, provide policy advice and develop policy recommendations	Body operating independently of government, working closely with policy makers

Notes: * Productivity Boards established based on existing advisory councils.
** Boards linked to existing governmental institutions

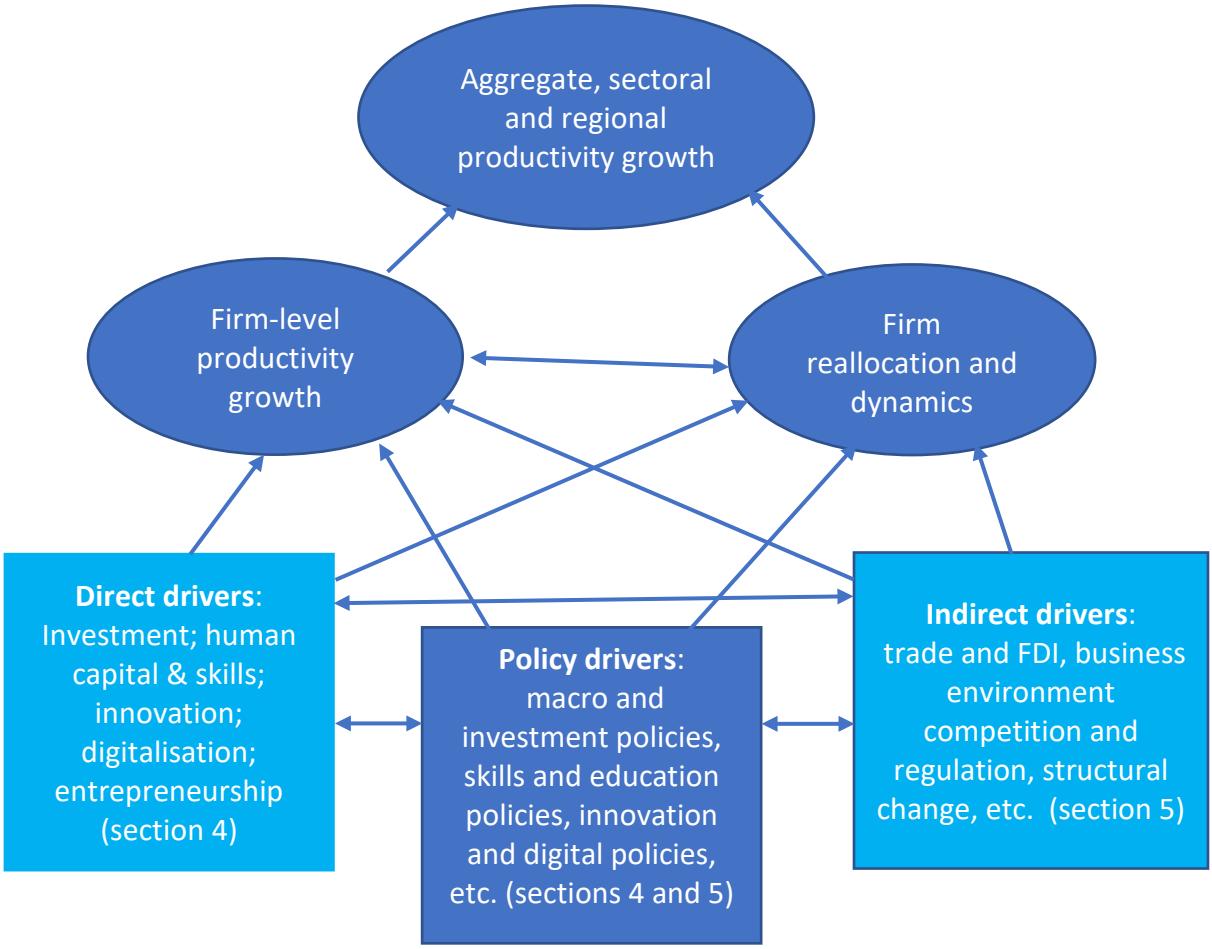
Source: National sources and Renda and Dougherty (2017), see also: https://economy-finance.ec.europa.eu/economic-and-fiscal-governance/national-productivity-boards_en for EU countries.

The UK Productivity Commission is somewhat different from the others included in Table 1. It is essentially a group of independent experts, mainly from academia and policy research institutions, who strive to develop ideas for a pro-productivity policy agenda. The Commission draws on a wide range of expertise (from its own Commissioners, invited experts, incl. some (ex-)policy makers, and researchers from third parties and The Productivity Institute). It also engages in discussions with policy makers to determine policy opportunities and solutions. It is supported by a secretariat at the National Institute of Economic and Social Research (NIESR) and draws on funding provided by The Productivity Institute.

2.2 Framing the discussion on productivity

Productivity is a complex phenomenon, driven by many factors and policies. To facilitate the discussion in sub-sequent sections, this section provides a simple framework for the rest of the paper, drawing on OECD work (Figure 2; OECD, 2015; Albrizio and Nicoletti, 2016).

Figure 2: Simplified framework to explore productivity growth



Source: Drawing on Albrizio and Nicoletti (2016).

The framework distinguishes between two types of drivers of productivity and two areas of pro-productivity policy:

- **Direct drivers of productivity.** These correspond to the main production factors driving economic growth, i.e., a) investment and capital formation; b) human capital and skills; and c) technological progress, as driven by innovation, digitalisation, and entrepreneurship. Pro-productivity policies in this area aim to influence these drivers directly, e.g., through investment policies, education and training policies, innovation and digital policies, or policies related to entrepreneurship and business dynamics. Thus far, the bulk of the work of productivity commissions has been focused on these drivers and the related policies.
- **Indirect drivers of productivity.** These drivers and the related policies affect productivity indirectly, mainly by influencing markets and the incentives for firms to improve productivity growth, e.g., through trade, competition, regulation, and industrial policies,

but also policies related to labour market pressures or resource constraints. Productivity commissions have thus far explored a diverse range of issues in this area.

The framework also notes the respective roles of productivity growth within firms and reallocation between firms for aggregate productivity growth. The framework is mainly intended to help structure the remainder of the paper and is not intended to be precise or exhaustive.[5] Direct drivers of productivity and the related policies will be discussed in section 4, and indirect drivers and their related policies in section 5.

3. The context for the work of productivity commissions

The growing role of productivity commissions reflects the growing importance that many countries attach to productivity, reflecting its fundamental role in economies and societies; concerns about the sharp slowdown in productivity over the past decades; and strong interest in identifying factors and policies that affect productivity and might allow for productivity-enhancing interventions. This section does not review the extensive literature on productivity and its drivers but is intended to provide some broad context for later sections.

3.1 Why does productivity matter?

In the context of their work, many productivity boards have been asked to explain why productivity matters and why policies for productivity are important for overall economic performance and for society more generally. This is a recurring theme in the work of several commissions. A helpful example of recent work is the latest (interim) report of Australia's Productivity Commission (Productivity Commission, 2022a) that provides an extensive discussion and overview of several key dimensions of productivity. It makes the following key points on productivity, that are echoed in work by other commissions:

- Productivity growth is the only sustainable driver of increasing living standards over the long term. Economic growth based solely on physical inputs cannot go on forever, but growth based on knowledge and ideas may well be inexhaustible.
- Productivity growth over time and across the globe has lifted billions of people out of poverty and has led to a dramatic increase in living standards for much of the world's population. Moreover, technological developments and inventions have driven huge increases in the quality and length of life over the past century.
- There are very tangible benefits of productivity growth that come in the form of a) goods and services that cost less, with less work needed to afford them; b) goods and services whose quality improves over time; c) completely new goods and services.
- While productivity growth is an imperfect measure of rising wellbeing, lifting the rate of productivity growth is an essential element of any policy strategy aimed at increasing welfare. Productivity growth relaxes the constraints of scarcity and creates new opportunities — for individuals, businesses and the general community.

[5] For example, the paper will examine issues related to entrepreneurship and firm dynamics under the direct drivers of productivity, although firm dynamics is also shaped by indirect drivers, such as competition.

These issues are also acknowledged in the first report of the UK Productivity Commission, which noted that productivity is a key enabler for improvements in wages and living standards and a necessary condition for sustainable economic growth (NIESR, 2022).

Although the central role of productivity is reflected in the work of all the boards, there is also growing agreement that is not the only objective that matters. Some boards, e.g., Austria's newly established board, are starting to pay attention to broader perspectives on wellbeing and welfare, including in exploring the diffusion of the benefits from productivity across the economy and to workers.

Moreover, the growing policy focus on issues such as climate change and resilience are forcing boards to look beyond GDP and productivity as the main indicators of performance. At the same time, most boards have not yet broadened the analysis of productivity beyond labour and multi-factor productivity, e.g., to resource productivity or measures of productivity adjusted for environmental impact (see, for example, Cárdenas Rodríguez, et al., 2018).

3.2 The slowdown in productivity growth

The current work of the productivity commissions occurs in a context of an overall decline in productivity growth over the past decades (Figure 3). This slowdown occurred despite the ongoing diffusion of new technologies, which might normally be expected to help increase productivity growth. An extensive literature has emerged about explanations for the slowdown and the limited impact (thus far) of new technologies.

Some of the key factors emerging from that literature include (OECD, 2021):

- An apparent slowdown in the rate of technological progress compared with previous phases of economic growth.
- The growing complementarity of investments in intangibles such as organisational change, process innovation and business models with investments in hardware and technology, implying both types of investment are required to drive productivity growth. Moreover, some of these intangible investments may be harder to realise and slower to generate a return.
- The slowdown in the pace of diffusion from the most advanced firms to the rest of the economy, reflecting a growing productivity divergence between leading firms and others (OECD, 2015).
- Underlying structural changes in the economy, such as the shift from manufacturing to services, as well as demographic changes.
- Productivity measurement, although most studies agree that while there is some mismeasurement of productivity growth, it cannot explain the slowdown in productivity growth.

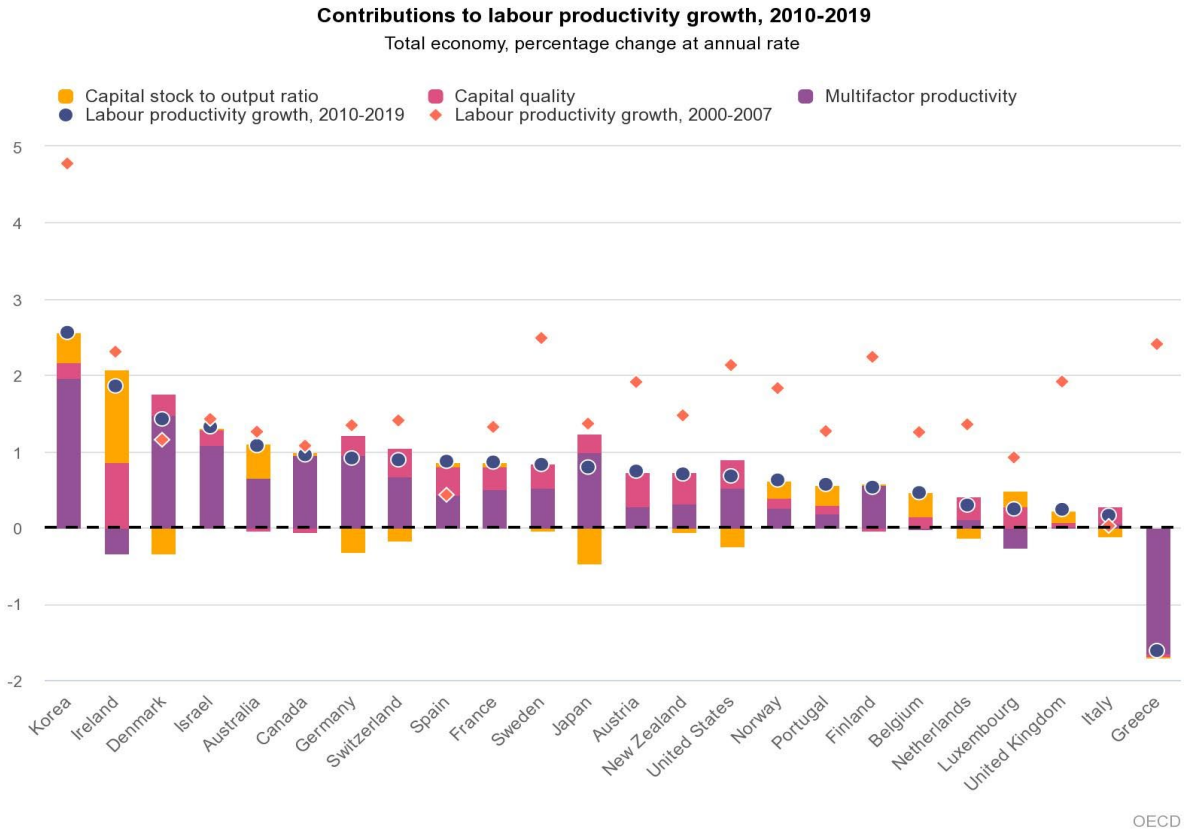
Other potential factors contributing to the slowdown discussed in the literature include:[6]

- A return to "normal" rates of productivity growth after a period of exceptional gains in productivity due to digital technologies (Fernald, 2014).

[6] See also Goldin, et al. (forthcoming) for a recent review of the literature including a quantification of the contribution of various factors.

- Transition costs linked to the adoption and diffusion of technologies, implying that the productivity benefits of new technologies should still emerge in time (Brynjolfsson, et al., 2021).
- Growing misallocation of capital inflows following the decline in real interest rates linked to the eurozone convergence process (Gopinath et al., 2015).
- Cyclical factors, for example the productivity slowdown could be an endogenous response to the slowdown in demand that induced the 2008 economic downturn (Anzoategui, et al., 2016).
- A slowdown in investment and capital deepening (OECD, 2015).

Figure 3: The Slowdown in Productivity Growth



Source: OECD (2021), Compendium of Productivity Indicators 2021.

In the context of the slowdown in productivity growth, several productivity commissions have undertaken their own work to better understand the contribution of these (and other) potential factors to the slowdown in productivity to help identify factors that could be addressed through (national) policy action. For example, the first productivity report of **France**'s board included a stocktaking of productivity trends and an analysis of features common to all developed countries and those specific to France (Conseil National de Productivité, 2019). It pointed to several common features, several of which reflect the list of factors above:

- A shift in the structure of production towards sectors with lower productivity levels, notably the shift from industry to services. On the other hand, it noted that since 2000, it

has mainly been the slowdown of productivity within sectors that has contributed to the slowdown.

- A decline in the contribution of ICT to productivity growth since the early 2000s, mainly due to a slowdown in the ICT sector, but also reflecting lower productivity gains in firms using ICT technologies and more limited reallocation effects linked to this use.
- A growth in productivity dispersion between firms as aggregate productivity growth declined, with weaker productivity growth in industries characterised by the largest divergence in productivity. The report noted that this could be due to a slowdown in technology diffusion.
- Other common factors, for which the evidence is more mixed, such as changes in market concentration and competition, or the structural decline in interest rates that might have made less productive investments more profitable than before.

The report also pointed to a range of specific features for France that might have contributed to the slowdown, such as lacking skills, growing skills mismatch, the relatively low quality of management, lagging uptake of ICT, and a gap in innovation performance.

Germany's 2019 productivity report added to this analysis by pointing to the role of demographic factors as an additional factor driving growth and productivity, not only through impacts on the workforce and the composition of the workforce, but also through its impact on investment (e.g., firms with many older workers invest less in innovative equipment as the human capital of older workers is less complementary to new capital) and on start-up creation (Sachverständigenrat, 2019).

Portugal's 2019 annual report also included a stocktaking of the literature on the drivers of productivity and the factors that were considered particularly important in the Portuguese context (Conselho para a Produtividade, 2019). It considered that gaps in human capital, innovation and R&D, market flexibility in labour and product markets, as well as vulnerabilities in financial markets, were particularly important for Portugal.

The work by these boards (and others) shows that the decline in productivity growth is of broad concern to all boards, and much of their work is aimed at identifying and addressing factors that may help reinvigorate productivity. Some of the boards have also attempted to distinguish between underlying global and structural factors affecting productivity, some of which might not be easily amenable by national policy action, e.g., the shift from manufacturing to services or the pace of technological progress, and national factors, e.g., skills shortages or the capabilities of the innovation system, that can be addressed by national policies.

3.3 The impact of the COVID-19 crisis on productivity

While the long-term slowdown in productivity growth is a longstanding concern for policy makers interested in productivity, short-term concerns also influence the work of productivity commissions. In recent years, several productivity commissions have devoted much of their work to measuring, understanding and responding to the impact of the COVID-19 crisis on productivity. Without going into excessive detail, several factors affecting productivity are highlighted in this work, e.g., in countries such as **Belgium** (National Productivity Board, 2020;

National Productivity Board, 2021) and **Germany** (Sachverständigenrat, 2021). Some of these factors might have positive impacts on productivity, others negative:

- Initially, positive impacts of the crisis on aggregate labour productivity, as hours worked typically fell more rapidly than value added.
- A variety of impacts of the crisis on the composition of employment, linked to varying impacts of the crisis on different industries and groups of workers, including their ability to work from home. Moreover, the crisis also affected education and skills development in various ways, with both negative and positive impacts on workers' skills.
- Negative impacts on aggregate private investment, in particular non-ICT capital, due to the economic crisis, constraints on access to capital, and increased uncertainty.
- Impacts on the composition of investment, with potentially increased investment in ICT capital linked to the drive for digitalisation of work and business more generally. In addition, in some industries and countries risky investment in R&D might have been postponed.
- Reduced foreign direct investment, and potential shifts in value chains.
- Reduced public investment, at least in the short run, although recovery packages in many countries were seeking to adjust for this later in the crisis.
- Potential positive and negative impacts on multi-factor productivity growth in the medium to long run, linked to greater use of ICT across the economy; increased teleworking – although with uncertain impacts on productivity growth; and varying impacts of changes in investment in innovation and R&D.
- Impacts on business dynamism and resource allocation, with start-ups initially hit hard, and firm exit slowing down due a range of policies that governments put in place to protect firms' liquidity. The loss of start-ups at the start of the crisis could have cascading effects and limit the emergence of high-growth firms in certain areas. Moreover, the slowdown in firm exit risks leading to more so-called zombie firms. The first impact appears to have been temporary in many countries and start-up rates are currently above pre-COVID levels in several countries (Agresti, et al., 2022).
- Negative impacts on competition, e.g., due to growing concentration linked to competitors exiting the market; fewer new challengers due to lower start-up rates; growing productivity divergence as larger firms often adjusted better to the crisis than small firms; risks of more mergers and acquisitions; risks associated with high levels of state aid, that may distort competition within countries and across border, etc.
- Impacts on value chains and globalisation, where disruptions in value chains and long-term changes in globalisation more generally could have negative impacts on productivity.
- Structural effects on productivity, as some industries experienced strong growth, e.g., ICT services, and others were affected by a sharp fall in demand, e.g., tourism. Moreover, consumer behaviour and production technologies changed considerably in some industries, with potential effects on productivity in the long run.

The aggregate impact of these various effects is uncertain and may be either positive or negative. The impacts may also vary considerably across firms, industries and countries, and could therefore increase divergence in productivity, both between industries and firms, and

across countries. For example, evidence across several countries suggests that firms that were already intensive ICT users invested most in ICT during the crisis, possibly extending their lead over lagging firms.

The COVID-19 crisis has not only affected the analytical work by the various boards, e.g., in exploring the role of telework for productivity or the impact of changing business dynamics, but also their role in providing policy advice. Several boards have contributed to helping governments in developing their crisis response, including in the context of recovery programmes. Following the crisis, the latest reports of several boards are returning to the long-term productivity agenda or are starting to address other urgent policy challenges linked to productivity, e.g., energy and resource security or climate change.

3.4 Productivity analysis by productivity boards

Most productivity boards have engaged in empirical analysis for their work, and in some (e.g., Finland, Netherlands and Portugal) this currently appears to be the focus of their work. Much of the type of analysis undertaken is standard to the productivity literature, i.e.:

- Examination of trends and patterns of productivity growth, both at the aggregate and sectoral level, and across time and countries.
- Growth accounting, to determine the proximate causes of productivity growth, i.e., human capital and skills; investment in tangible and tangible capital; technological progress, etc.
- Examination of the microeconomics of productivity, using large firm-level datasets to explore the contribution of different sub-sets of firms to productivity growth and examine patterns of productivity divergence and convergence over time. Such work has also drawn on international work, e.g., the OECD's MultiProd project (Berlingieri, et al., 2017a).[7]
- Comparison of productivity levels, either at the aggregate, industry or firm level, to help assess the gap in productivity performance between national and international leaders. For example, New Zealand's inquiry into frontier firms found that New Zealand's frontier firms have labour productivity levels that are less than 50% of those in other small advanced economies like Belgium, Denmark, the Netherlands and Sweden (New Zealand Productivity Commission, 2021).
- Economic modelling, e.g., to estimate the impact of certain policy measures on aggregate productivity.
- Examination of specific factors and drivers of productivity through a range of descriptive and analytical work, e.g., the role of skills and human capital; exporting and productivity; etc.

This analytical work and the resulting evidence help underpin productivity-related policies and will continue to be essential for the work of the boards. Some boards, e.g., Ireland, have recently recommended to strengthen the evidence base for productivity-related policies and deepen the analytical work (National Competitiveness and Productivity Council, 2021).

Given the shared interest of the boards in empirical analysis, there is likely to be scope for further collaboration between the boards on such analytical work and on building the data

[7] See also: https://www.oecd.org/sti/ind/multiprod.htm

and evidence base for their policy advice. This could involve collaboration through international organisations, such as the EU and the OECD, or directly between boards interested in specific topics. It can also draw on academic work, such as the work undertaken by The Productivity Institute.

4. Direct drivers of productivity

This section reviews what the various productivity commissions highlight as the direct drivers of productivity in their country and seeks to identify some stylised facts and common patterns. It does not seek to summarise all the economic arguments made in the extensive body of work produced by the commissions. Rather, it points to key findings that reflect the focus of work of the boards and that may be of broader interest. The section covers five issues, i.e., investment in tangible and intangible capital; human capital and skills; R&D and innovation; digitalisation; and entrepreneurship and business dynamics. A short concluding section summarises the work, including in comparing with the work in the UK, and draws some conclusions.

4.1 Investment in tangible and intangible capital

Investment and capital formation are typically considered among the most important drivers of (labour) productivity and can also have spill-over effects on multi-factor productivity. Productivity commissions have looked at a range of issues in their work, such as the slowdown in business investment in many countries, as well as the respective roles of tangible and intangible capital and of ICT and non-ICT capital. Several productivity commissions have also examined the role of public investment for productivity, notably investment in infrastructure, that is often considered to have a catalytic effect on private investment and on productivity.[8]

Australia

Australia's 2022 five-year review pointed to the decline in business investment as a share of GDP, as in several other advanced economies (Productivity Commission, 2022a). It noted that the decline reflects investment decisions of individual firms in their specific business environment, as well as structural changes in the economy that have affected aggregate investment. It noted that costs and availability of capital as well as profitability levels did not appear to affect investment levels in the country. Factors that were considered relevant to investment decisions included the opportunity cost of capital, perceptions of risk, and the degree of market power enjoyed by individual firms. Structural factors were considered to play a relatively limited role, although the shift from manufacturing to services may have reduced the share of investment in tangible capital and increased the share of investment in intangibles. Moreover, size differences between firms may affect aggregate investment, with a relatively small group of large firms (1% of all firms in the non-mining sector) accounting for about 40% of total investment. Smaller firms continue to have more limited access to credit than larger firms, although new sources of funding have become more important for SMEs.

[8] The role of foreign direct investment is explored in section 5.1.

The review recommended that government should not promote investment at any cost. It argued that public investments should always be rigorously assessed for their net social benefits, especially when there are opportunity costs linked to the use of scarce labour or other resources, thus avoiding allocating resources to low value activities and encouraging rent seeking behaviour. The review also pointed to the potential dampening impacts of certain policy settings on investment, such as pressures for greater self-reliance in the wake of the COVID-19 crisis and geopolitical disruptions. It argued that overall business investment does not appear to be responsive to the declining cost of capital and underscored the need for productivity-enhancing reforms to improve expected risk-adjusted returns.

Belgium

Belgium's productivity board is amongst a limited number of commissions that has considered the link between macroeconomic policy, investment and productivity. In 2019, it noted the importance of growth and productivity for tax revenues, which in turn would allow for government spending in different areas (National Productivity Board, 2019). It also noted that higher productivity growth could widen the range of political choices for government. Moreover, sufficient productivity was considered a precondition for enabling a budgetary policy that can react to recessions and asymmetric shocks. Policy-wise, the board pointed to the growing role of budgetary policies, as foreign exchange rate policies and monetary policies are no longer available to policy makers in the country. It also noted that a stable, balanced, well-performing economy creates trust in companies and individuals, encouraging them to invest for the future. Moreover, it argued that a favourable environment offers the government financial room for manoeuvre, enabling it to influence the behaviour of companies and individuals with direct and/or indirect incentives.

The 2020 productivity report noted that sound public finances were important, but that these should provide room for public investment (National Productivity Board, 2020). It pointed to the importance of investment in high-quality (hard and soft) infrastructure; investment to support the digital and green transition, e.g., in areas such as energy efficiency, sustainable transport, climate adaptation, and digital infrastructure; as well as R&D, though while improving the efficiency of investment in public R&D. It also noted the need to improve the efficiency of public spending, engage in public-private partnerships, and remain attractive to foreign direct investment.

The 2021 productivity report examined the country's National Recovery and Resilience Plan in some detail, including its support for public investment and its potential contribution to productivity growth (National Productivity Board, 2021). Based on analysis by the Federal Planning Bureau, the board noted that the plan is a real investment plan that will increase capital formation. However, its effect is modest, due to the relatively small scale of European funding available for Belgium. The board also noted that the duration of investments' impact on productivity is longer than the implementation period of the plan, with impacts still expected in 2040, due to the long-term impacts of public investment on private investment. The report also noted that simultaneous recovery plans in other EU countries may have important spill-over effects on Belgium. Moreover, it noted the importance of complementary structural reforms that in its view could have been used better to strengthen

the impacts of the plan. Finally, it pointed to the importance of specific areas of investment, including investment in digitalisation and R&D, and in support of the green transition.

Denmark

The 2019 productivity report devoted some attention to policies to foster investment, and evaluated several targeted measures taken by the government in 2017 to strengthen investment in small and medium-sized firms (De Økonomiske Råd, 2019). It noted that such measures were only justified in the presence of strong market failures affecting such firms, as they might otherwise bias investment towards areas with a low social return.

The 2020 productivity report explored the benefits of public investment in transport infrastructure on economic activity and productivity (De Økonomiske Råd, 2020). It pointed to the importance of cost-benefit analysis but noted that some benefits will be hard to capture due to spill-over effects. It noted also that most studies do find positive impacts of public investment in infrastructure on economic activity and productivity and pointed to a study for Denmark on the competition of a section of motorways in Jutland that found positive effects on local business income and employment. Due to possible relocation effects, it did not provide estimates of the overall impact at the national level. The report concluded that policy makers should consider all impacts of investment in public infrastructure and continue to improve methods to calculate these impacts.

Finland

Finland's 2020 productivity report pointed to changes in capital intensity, both ICT and non-ICT capital, as important drivers of labour productivity growth (Ministry of Finance, 2020). However, partly linked to the sharp slowdown in productivity from 2008 onwards, the contribution of capital intensity to labour productivity growth over the period 2001-2015 was smaller in Finland than in several peer countries, such as Denmark, Germany and Sweden.

Related to the focus on investment, it also explored the link between macro-economic factors, investment and productivity (Ministry of Finance, 2020). It pointed to several influences of demand and the business cycle on productivity growth. This includes changes in the rate of capacity utilisation as well as demand shocks, that may reduce value added in the short run, possibly without a simultaneous decline in hours worked.

Germany

Germany's 2019 productivity report pointed to the importance of investment for productivity and noted lagging investment in ICT equipment, including digital infrastructure, and complementary intangible assets such as software, databases and R&D, as areas where Germany is lagging (Sachverständigenrat, 2019). It also pointed to the importance of a reliable business and regulatory environment, including a competitive tax system, for investment. At the same time, it noted that fiscal policy needs to provide space for investment in public infrastructure and growth-promoting spending, e.g., in areas such as energy supply, digital infrastructure, transport infrastructure and public services, while noting that such investment should not undermine the responsibilities of private businesses and households, e.g., in areas

such as broadband networks or charging points for electric vehicles. As regards overall investment and the lack of equity financing in Germany, the Council reiterated its call for a tax allowance for corporate equity, to help balance the current privileged tax treatment for borrowed capital.

Ireland

The 2020 report explored the importance of public investment in infrastructure for productivity and competitiveness (National Competitiveness Council, 2020). It pointed to shortcomings in Ireland's infrastructure and noted that several international reports considered this a key weakness in Ireland's performance. The report noted that austerity following the 2008 economic crisis had led to considerable underinvestment in infrastructure in several areas, including transport, health, public housing, communication and education. It pointed to a need for more spending, but also to actions to improve the quality of infrastructure spending, including by improvements in the planning, allocation and implementation of investment projects. It recommended to improve support for public bodies in meeting their requirements in evaluating, planning and managing public investments; and address challenges to regions and cities to learn from best practice across the country on ways to maximise the efficiency of public spending. It also provided more specific recommendations for digital connectivity and transport. For digital connectivity, it recommended to map the types and capacity of remote working facilities to identify gaps and meet local business needs. For transport, it recommended the roll-out of better and greener transport links to avoid traffic gridlock once the economy recovered from COVID-19 and more returned to work. The report also urged taking a long-term perspective on infrastructure spending to enhance the productivity and competitiveness of Irish firms.

The 2021 report focused on housing investment and noted that affordable housing is important for competitiveness as it can indirectly affect enterprises' costs and influence the competitiveness of goods and services, the quality of life of people living in the country and could potentially also affect the attractiveness of Ireland as a location for investment (National Competitiveness and Productivity Council, 2021). The report also noted that adequate housing can facilitate labour mobility and help economies adjust to adverse shocks, such as the recovery from the COVID-19 crisis. The report argued for a structural shift in the approach to housing policy, as efforts thus far have failed to deliver tangible improvements in housing delivery. This would require prioritisation and resources directed to areas where real change could be achieved. It also argued for the establishment of reporting and evaluation mechanisms, allowing for a better monitoring of the impacts of housing market interventions and adjustments to schemes if they proved to be distortive. Moreover, it recommended the provision of adequate resources to planning authorities to avoid delays in the approval of housing and other critical infrastructure.

The 2022 report returned to the challenge of infrastructure investment (National Competitiveness and Productivity Council). It noted that while public investment in infrastructure had increased in recent years, it was important to ensure effective and timely delivery of this investment. It called specific attention to investment in energy systems, including a clear path for the decarbonisation of Ireland's energy supply; investment in digital infrastructure; housing, as well as Ireland's social infrastructure. It noted the importance of

an efficiently functioning planning system for the timely delivery of infrastructure and pointed to growing labour market pressures that are affecting the capacity to deliver on the investments required. It recommended actions that would increase innovation in the construction sector, contributing to productivity and quality improvements, as well as the upskilling of construction workers. It also recommended actions to improve planning, including as regards an ongoing review of the planning code, as well as the resourcing of planning authorities and judicial systems. It also recommended actions to speed investment in green generation capacity, including in the context of the regulatory process, and strengthen actions as regards energy storage solutions.

Netherlands

The 2021 report explored the role of intangible assets for productivity growth (CPB Netherlands Bureau for Economic Policy Analysis, 2021). It found that investments in intangible capital rose sharply as a share of GDP in the Netherlands since the 1990s, enabling the Netherlands to catch up with the frontrunners in such investments, the United Kingdom and the United States. This growth was driven by higher investment in computerized information and organizational capital, with services firms as the main drivers of growth. These investments accounted on average for a quarter of Dutch GDP growth since 1995. The report also noted that investment in intangibles was closely linked to investment in digital technologies, which saw strong growth during the COVID-19 crisis, linked to telework and strong demand in several services sectors, including education, health and retail trade. The report noted that the Netherlands was already quite advanced in the use of digital technologies, notably in areas such as high-speed broadband and digital payments. It noted that the impact of these developments on productivity remains to be seen.

New Zealand

A 2021 report found that New Zealand's firms are typically capital-shallow and that workers lack equipment and other capital goods (New Zealand Productivity Commission, 2021). It attributed this to the high off-the-shelf price of capital goods, past periods of high long-term interest rates, and fast population growth. Low returns to investment, low wages and ready access to low-cost immigrant labour were also considered as contributing factors.

Portugal

The 2019 report called for a more detailed assessment of changes in investment dynamics following the 2008/2009 economic crisis (Conselho para a Produtividade, 2019), as this was considered among the main factors in explaining the slowdown in productivity in Portugal. Such an assessment should seek to explore to what extent changes in the financial system and the deleveraging process of Portuguese firms are cyclical or structural. The 2020/2021 report documented new work undertaken by the board on the dynamics of investment in Portugal (Garcia, 2020; Conselho para a Produtividade, 2021). It noted that Portugal had higher investment rates than its European peers between 1995 and 2000, but that investment already started to decline before the economic crisis, with intellectual property the only asset not experiencing a decline, and a particularly strong decline in infrastructure. It also examined structural trends and the determinants of investment and found that reductions in debt levels

and labour market regulation had a positive effect on aggregate investment, while uncertainty, financial constraints and the level of interest rates had a negative effect.

United Kingdom

The first report of the UK Productivity Commission pointed to low levels of investment as a factor that had contributed to the UK's poor productivity performance over the past decades (NIESR, 2022). It pointed to a range of contributing factors, including lack of growth finance; the overall business environment for investment, including taxation, the cost of capital and the level of public investment; economic uncertainty including linked to Brexit and the COVID crisis; as well as a labour market environment that may have favoured hiring of labour over investment in machinery and equipment. The report also pointed to the importance of foreign direct investment (see section 5.1. The role of measurement, notably of intangible investment in the services sector, was also discussed. The report also noted the importance of investment in public infrastructure for productivity performance, pointing to the importance of transport, housing and broadband for productivity performance and for the agglomeration of activities The report included several suggestions for policy action, including a long-term infrastructure plan that might spur or catalyse additional private investment; reductions in the cost of capital driven by tax breaks; improvements in the tax environment; and faster growth in UK exports resulting from new trade deals.

4.2 Human capital, skills, management and attracting talent

Together with capital formation, human capital is typically considered among the most important drivers of productivity, also because it is highly complementary to investment in fixed and intangible assets. Productivity commissions have explored a wide range of issues in their work, from the role of education, including STEM education; skills formation and skills mismatch; the role of management and managerial capital; and the contribution of migration to productivity.

Australia

The 2017 5-year productivity review explored several issues linked to education and skills (Productivity Commission, 2017a). It pointed to a wide range of challenges, including in schools, vocational education and training, informal forms of learning, higher education, the relevance of skills in the existing workforce, and supportive labour markets. It noted the importance of jobs and the skills embedded in jobs for increased productivity, and pointed to a range of ongoing developments, including in technology and consumer preferences that are affecting demand for new skills and jobs. The review also set out key policy settings on the supply and demand side of skills development, as well as key policies linked to participation in the labour market; job matching and mobility; as well as linked to business and employment conditions (e.g., workplace relations, occupational health and safety, and workers compensation). It recommended to improve educational outcomes of students; the development of tools for proficiency-based assessment of skills, rather than just competencies; frameworks to facilitate the independent accreditation of skills obtained through any learning method; the coverage of universities under consumer law, thus increasing accountability and student's rights; and improvements in the supply and access to

information for all Australians about career and education options, including on how to make career changes later in life.

The 2022 five-year review devoted one of its background reports to human capital (Productivity Commission, 2022a; 2022e). The review pointed to the importance of education in increasing people's capabilities and pointed to a range of societal benefits. It estimated that rising skills accounted for about 19% of the growth in output per hour in the market sector from 1994-95 to 2020-21, but also noted that one in five Australians still have low basic skills, limiting their opportunities and future earnings. It also pointed to the importance of both general and foundational skills, e.g., literacy and numeracy, but also critical thinking, and more specific skills, e.g., digital skills. The review noted that it could not predict future jobs or skills, but that an adaptable skills system can be resilient to the inevitable changes.

As regards secondary education, the review recommended several actions to improve school productivity. This included more evidence gathering and diffusion of best teaching practices; the appropriate use of digital technologies; better use of teacher's time, focused on quality teaching and learning rather than administrative tasks; and greater scope for innovation. On tertiary education, it recommended stronger incentives for providers to deliver courses adapted to changing skills needs; less use of rationing places; more efficient and equitable allocation of government subsidies; better setting of prices to reflect course delivery costs; increased competition for funding across education providers; expanded loan access for vocational education and training; and a rebalancing of funding to reflect the growing importance of lifelong learning. It also provided recommendations on how to improve teaching quality in tertiary education, including improved incentives to invest in teaching quality (e.g., in universities); better adapted use of technology; continuous improvement in teaching quality; and actions to reduce non-completion rates.

Belgium

The 2020 report reflected on the impact of the COVID-19 crisis on skills, noting that the existing mismatch in skills risked becoming even wider because low-skilled people were hit the hardest by the crisis (National Productivity Board, 2020). It noted that the digital transformation was being accelerated due to the crisis, further changing skills needs. In the context of an ageing population, it noted that it was crucial that as little talent as possible was lost and that lifelong learning need to be strengthened to facilitate labour market transitions. The report argued for a comprehensive approach to life-long learning, addressing both the supply and demand side. This would include training sufficiently adapted to economic development, e.g., in STEM subjects and ICT-related disciplines; more training aimed at increased intersectoral mobility and at ensuring that all receive a minimum level of skills; greater participation in lifelong learning by all target groups, including through greater use of distance learning; and specific attention to the training needs of smaller businesses as these tend to invest less in training. It also noted that all actors (employees, employers and training providers) should assume their responsibilities, but that government must provide a framework that encourages investment in training. The 2022 report regarded the shortage of STEM skills (and ICT skills, in particular) as a having a significant adverse effect on productivity (National Productivity Board, 2022). It suggested that policies aimed at promoting the adoption or new technologies or business practices would only lead to sustainable

productivity growth if combined with measures to increase the supply and mobility of human (STEM) capital.

Denmark

The 2022 report discussed the role of foreign labour for productivity and explored the empirical literature for Denmark (De Økonomiske Råd, 2022), noting that inflows of foreign labour can increase productivity by providing access to new knowledge, improving skills use, and encouraging reallocation. However, it might have negative impacts on jobs and wages of domestic workers. Results of empirical research in Denmark are ambiguous, however, with some studies finding negative impacts on domestic workers and others positive. It also explored proposed policies to attract foreign labour, in response to labour shortages in the economy. This includes (temporarily) reduced thresholds for pay of foreign workers, and expanded list of persons eligible, and greater access to fast-track procedures. It argued that the reduced thresholds should be made permanent as it would constitute a structural improvement in improving access to foreign labour, which would be particularly important during periods of high demand and strong employment opportunities. The report also discussed employment policies for refugees and found that a set of so-called industry packages that were introduced by municipalities in the 2013-2018 period had been effective in improving their employment prospects, increasing their employment rate by 50%. These packages matched newly arrived refugees with local industries that faced recruitment challenges, also providing the refugees with basic skills.

The report also discussed a government scheme to relocate education and training schemes from large cities to the regions (De Økonomiske Råd, 2022). It noted that this would reduce efficiency but could be beneficial to business activity in the regions if it led to a genuine increase in educational enrolment. Plans by universities to implement the agreement, however, suggest a focus on reducing places in the cities rather than relocation, which will limit the benefits for regions and could risk lowering overall education levels, with potential risks to productivity.

Finland

The 2020 productivity report noted that changes in the structure of the labour force, due to new and better trained employees entering the labour force, had made a positive contribution to labour productivity growth, although less than in some other OECD countries (Ministry of Finance, 2020). It pointed to the quality of management as one important factor determining productivity. It noted the growing international literature on management as a factor affecting productivity and found that the average quality of management in Finland is quite good. On the other hand, as is also the case in other countries, the quality of management practices varies widely across the economy, with many poorly managed firms in the economy. It noted that this suggests scope to further improve the quality and productivity of management in Finland.

France

The 2019 report identified relatively low skills of the workforce as one of the specific factors that might help explain a more pronounced slowdown in productivity in France than in other countries (Conseil National de Productivité, 2019). It also identified a significant skills mismatch between workers' skills and those required for their job as an important challenge. Moreover, it noted that French firms seem relatively less efficient in the human dimensions of management relative to their performance in production.

The 2021 national productivity report devoted one of its three chapters to skills and productivity (Conseil National de Productivité, 2021). It pointed to the mediocre level of skills in France compared with other European countries, both for the working age population and for children and youth in school. It also noted that France's schooling system is less successful in reducing inequalities than systems in other countries. This implies that France has greater inequalities between adults, and that the level of skills is particularly low for those with few skills. The report also noted that although labour productivity is high, France's poor performance in initial skills acquisition has a negative impact on labour market participation. It noted that, until recently, there was a lack of focus on lifelong learning and vocational training, and a lack of targeting on those who need skills the most, such as the unemployed and least qualified. Moreover, France's high structural unemployment rate translates into a loss of skills for those not participating in the labour market. The report also pointed to an ongoing polarisation in the labour market in France, with a decline in the share of middle-skilled jobs, a strong increase in highly skilled jobs and a more modest increase in low-skilled jobs. This polarisation seemed more pronounced in large metropolitan areas and was also found between companies with highly qualified workers more present in the most productive firms. It also pointed to a change in skills needs, with growing demand for highly cognitive skills and non-routine, non-cognitive skills such as autonomy, management, and communication.

The 2021 report noted that the country faces two policy challenges: a) reducing educational inequalities from an early age; b) increasing lifelong learning and targeting the least qualified individuals. For the latter, it argued for a well-functioning, well-targeted and agile lifelong learning system, that can help meet demand for emerging skills, e.g., linked to the green transition. The report also noted the significant risk of loss of human capital linked to closures due to the COVID-19 crisis. It found that this is most likely to affect the most fragile students and that this gap is unlikely to be addressed unless specific policy measures are implemented. It also pointed to difficulties in integrating young people into the labour market following their training, combined with reduced opportunities and increased unemployment during the COVID-19 crisis, which will have implications for productivity unless targeted measures are undertaken.

The 2022 productivity report devoted two out of nine substantive chapters to human capital and skills (Conseil National de Productivité, 2022). A first chapter in the report drew on a study by France Stratégie (Bruneau and Girard, 2022) and found that about half of the long-term slowdown in productivity growth in France can be explained by a slowdown in the growth of human capital, where the report noted the close links between human capital and other within-firm factors such as management, innovation and the uptake of digital technologies.

The slowdown was explained by slower growth of education levels as more and more young people completed upper secondary and tertiary education. Improvements in women's education levels contributed most to productivity growth, but these were now converging on those of men. The chapter concluded that, given high levels of schooling, increasing the quality of education will now be a key lever for productivity growth, noting that France still has considerable room for improvement in this area.

A second chapter in the report focused on the role of skills, drawing on studies by France Stratégie (du Roscoät, et al., 2022) and the OECD (Criscuolo, et al., 2021). The first study emphasised the role of soft skills such as teamwork and creativity for innovation, and the role of diverse and complementary teams as well as trust and shared goals. The second study found that almost one third of the productivity gaps between frontier and median firms can be explained by human capital, and that the concentration of high-skilled workers in the best performing firms has increased over time. The analysis also pointed to the important role of managers for firm productivity and found that frontier firms tend have a more diverse workforce, in terms of gender, origin and age. The study also noted the complementary nature of human capital to other tangible or intangible assets.

As regards policies, the report noted the key role of human capital for productivity, and the need to increase its supply and quality. It pointed to several options for specific policy levers, including improved quality of initial education; increased use of lifelong learning and apprenticeships and actions to raise their quality; better training for managers; the promotion of diversity; and the facilitation of both residential and professional mobility. It also called for better recognition of the role of soft skills in promoting innovation and transformation. It recommended training and support for individuals in the awareness, mobilisation and legitimisation of soft skills; support for management and work groups in the process of integrating a diversity of profiles; and helping organisations develop an organisational environment that allows the development of cross-cutting skills.

Germany

The 2019 productivity report discussed the role of education and skills, pointing out that lifelong learning can help older workers adjust to new technologies and increase society's capacity to innovate (Sachverständigenrat, 2019). It also pointed to the need to improve equality of opportunity, noting that there is a strong correlation in Germany between children's education level and that of their parents. In this context, it pointed to the importance of early childhood education and greater flexibility in educational pathways. The report also discussed the role of management skills for productivity, an area where Germany is doing relatively well in international rankings. It noted that these were particularly important for Germany's "hidden champions", fast-growing SMEs with high global market shares in a specific area. Management skills were also considered important for ICT adoption, as firms needed to make complementary changes to organisational structure and corporate culture to exploit the full potential of ICT.

Ireland

The 2020 report examined the importance of skills in responding to the COVID-19 crisis, but also examined the medium-term needs for skills in the Irish economy, linked to rapid changes in work, the adoption of new technologies, and the impact of Brexit (National Competitiveness Council, 2020). It pointed to growing demand for new skills, including digital and managerial skills. It recommended intensification of efforts to increase the number of ICT graduates from the education and training system; further efforts to increase the share of workers with basic digital skills; actions to address the lack of awareness among SME managers on available management development opportunities and supports; increased cooperation between management training providers, focused on the sharing of data, knowledge and good practice; and further efforts to examine the impact of COVID-19 on skills needs to inform and design targeted industry-led responses.

The 2021 report noted that digital and managerial skills were particularly important in the context of the ongoing digitalisation of the economy, including teleworking, and the organisational changes linked to that process (National Competitiveness and Productivity Council, 2021). It noted that Ireland is doing well in the EU context as regards ICT specialist skills and is also above the EU average for those with above basic digital skills but lags for those with basic digital skills. The report also pointed to the challenge of management in the context of remote working, with many managers indicating that they had not received adequate training from their organisation. The report also noted that the reopening of the economy would challenge managers further, in having to deal with blended working arrangements of office and telework. It recommended that training and skills initiatives identified in key government initiatives be fully implemented and adequately resourced, to provide workers with the skills, including digital skills, needed for the future world of work. It also recommended further actions to ensure that SME managers are equipped with the necessary skills to navigate the post-pandemic recovery and enable more widespread flexible working.

The 2022 report also explored several issues linked to human capital (National Competitiveness and Productivity Council, 2022). It noted that Ireland scored well in several international rankings on the skilled labour market but pointed to some challenges. This included possible skills mismatch in the labour market; key skills gaps, notably in construction, the green economy, and digital skills; as well as gaps in lifelong learning and apprenticeships as a route to upskilling. It recommended the development of AI-related skills and skills for the zero-carbon economy, and development of the government's action plan for apprenticeships.

New Zealand

The 2021 inquiry into frontier firms pointed to the key role of talent and leadership for productivity (New Zealand Productivity Commission, 2021). It noted that high-quality management and leadership are important determinants of firm productivity, but that many New Zealand firms lack leadership skills. Moreover, it noted that despite large inflows of immigrants over the past 10 years, the country still faces skills shortages, suggesting an ongoing skills mismatch between the supply of labour through education, training and immigration, and the business needs of firms. The report also pointed to the significant use

of temporary migrant labour in New Zealand to meet seasonal employment needs. Overall, it suggested scope for a more systematic approach to building and retaining talent and leadership.

The report recommended stronger collaboration between research institutions and industry to develop skills for innovation. It also recommended the evaluation of existing programmes for building management and leadership skills before any roll-out of new programmes. It also recommended a review of migration policy to consider the optimal mix of permanent and temporary migrants; assess the role and objectives of migration policy; consider how migration policies can best contribute to attracting and retaining skilled migrants; and how to reduce inflows of low-skilled and temporary migrants over time. It also recommended working with industry to reduce reliance on seasonal migrant labour. Finally, it recommended more empirical studies and evidence building to support policy making related to migration.

Portugal

The 2019 report explored the role of human capital (Conselho para a Produtividade, 2019). It pointed to the great disparity in qualifications of the workforce, including for managers, as a factor limiting productivity growth. At the same time, the report noted important improvements in qualifications of younger generations, as well as improvements in the quality of education, as also emerging from PISA tests.[9] These improvements are reflected in a growing contribution of human capital to GDP growth. However, the report noted that there are still significant disparities in the level of qualifications, and that Portugal still has a higher proportion of workers with lower education levels compared with the euro area. The level of schooling of managers is substantially below the European average, especially in small firms, affecting the ability of firms to adapt to technological change and competition. The report also pointed to high segmentation of the labour market, which affects equity and efficiency, but also labour mobility and the incentives to improve workers' skills. The report called for further work to evaluate the role of human capital for productivity, focused on the various components of skills development (education, vocational training, etc.) as well as their complementarity. Assessing the financial literacy of entrepreneurs was considered important, given its role in access to credit and business investment.

The 2020/21 report returned to these issues in the context of a discussion on the growth of telework following the COVID-19 crisis (Conselho para a Produtividade, 2021). It noted that telework could improve the mobility of work, expand access to talent and increase competition. On the other hand, it might benefit higher skilled workers most, thus potentially increasing inequality. It also pointed to school closures as a factor that might inhibit up-skilling, and to skills mismatch as an important labour market distortion. Additional work by Portugal's productivity board found that entrepreneurial human capital is a key driver of firm dynamics (Queiró, 2021). Firms started with more entrepreneurial human capital are larger at entry and exhibit higher growth throughout their life cycle.

[9] The OECD's Programme for International Student Assessment (PISA) measures the abilities of 15-year-old students in several areas, see: https://www.oecd.org/pisa/

United Kingdom

The first report of the UK Productivity Commission devoted considerable attention to the role of education, skills and other dimensions of human capital for productivity performance (NIESR, 2022). It pointed to several factors influencing levels of human capital that required attention, notably a skills gap, including in basic skills; lack of high-quality training and participation in such training; a gender gap between boys and girls, notably for STEM skills; limited agility of the skills system; lack of incentives for upskilling and reskilling, notably for in-work training; lack of good management practices and leadership; and of employee engagement. It also pointed to declining labour mobility, which contributed to a growing skills mismatch between the supply and demand of skills. Options for policy change included increased government funding to reduce the skills gap; the provision of high quality training; better targeting of educational interventions, partnering with local authorities; improvements in the agility of the skills system; a stronger focus on lifelong learning and incentives for reskilling and upskilling, including through the tax system; better utilisation of women in the economy, including by greater attention for upskilling and training; and greater attention for management, employee engagement and leadership skills.

4.3 R&D and innovation

Innovation and technological progress are the third key driver of productivity in most economic theories of growth, and as confirmed by much empirical analysis. The work of productivity commissions has touched on several aspects, including the role of public and private investment in R&D and the role of public support; the role of innovation systems; and the role of diffusion.

Australia

The 2017 5-year productivity review pointed to the importance of an enabling innovation culture and key elements for a high-tech society, notably a well-educated workforce, good infrastructure and a strong research base (Productivity Commission, 2017a). It noted that improvements in these areas and in support for public investment in R&D and commercialisation were important. However, it stated that improving access to, and the availability of data, and making sure that firms can operate in an environment of intellectual license was a game changer for innovation. The findings on data drew on another 2017 report based on the Commissions 2017 Inquiry on Data Availability and Use (Productivity Commission, 2017b). The productivity review argued that Australian governments need to be more responsive and willing to experiment in creating a more innovative eco-system. It made recommendations to establish consumer rights over their own data, including the right to transfer data; the removal of barriers to greater use of public data, including in developing secure access that respects privacy; adopting a copyright law with fair use exceptions; and removal of the competition law exemption for intellectual property.

The 2022 five-year review focused on diffusion of knowledge across the economy rather than ‘new-to-the-world’ innovation, which according to the review relates to only one to two per cent of Australian firms (Productivity Commission, 2022c). It notes that diffusion has the scope to lift the performance of millions of businesses. Among the drivers of diffusion, it

pointed to a) a lack of performance assessment and low management capabilities in many businesses, reducing the adoption of best practice; b) a weaking of diffusion linked to declining labour mobility, firm exit and entry, and reduced investment in capital that embeds new ideas; c) low diffusion of best practice regulation. It recommended: a) policies to link Australian firms to foreign firms through trade and foreign direct investment policies, where the review pointed to the need for FDI screening and approval processes to protect national security; b) skills and migration policies, as discussed also in section 6.3, with a focus on transferable skills, including digital and management skills; c) policies to improve information flows to firms, including through public data and benchmarking services.

The 2022 review also pointed to the importance of knowledge diffusion in non-market services but notes that innovation in these services is often slow, piecemeal, disorganised, and inconsistent across jurisdictions, with benchmarking studies showing wide variations in the efficient provision of services across jurisdictions. The review noted that this reflects unique aspects of the public sector. For example, measures of success are contested and ambiguous; funding models create opposing and perverse incentives; norms and regulations discourage innovative approaches; and competitive pressures and the threat of exit are absent. It noted that many of the approaches to strengthening the diffusion of new processes and approaches in government services are well-known but underexploited. This includes new funding and procurement models, e.g. in health services, defence and public infrastructure; better service benchmarking, data collection and program evaluation to uncover inefficiencies and strengthen adoption of best practice; fewer restrictions on the hiring of migrants in the public sector to inject new talent; reforms to standard, data access and intellectual property to enable the diffusion of good ideas; greater diffusion of best practice; and better coordination across levels of government.

Belgium

The 2021 report noted that investment in R&D had increased since 2005, but that this was mainly due to some large firms (both domestic and foreign) and some industries (pharmaceuticals, and IT goods and services) (National Productivity Board, 2021). The report attributed the increase in spending partly to partial tax exemptions on wages for R&D staff. However, the 2022 report noted that efficiency gains could be achieved by better aligning direct and indirect support (National Productivity Board, 2022). The 2021 report also noted the high concentration of innovation in Belgium. For example, 40% of patents are from just 10 economic entities. The report pointed to the importance of a complete eco-system for innovation, including strong universities and research laboratories open to collaboration. The 2022 report noted that the transition to a digital and knowledge-based economy has increased barriers to diffusion and called attention to policies that can strengthen diffusion and for more exploration of the topic (National Productivity Board, 2022). It suggested focusing on the capacity of firms to adopt relevant technologies, incentives for adoption and policies to ensure the smooth reallocation of resources.

Denmark

The 2019 report evaluated an increase in the tax deduction for R&D, arguing that the overall effects were not clear from the evidence available in Denmark, and that more analysis of the proposal would be needed (De Økonomiske Råd, 2019).

Finland

The 2020 report noted that multi-factor productivity growth was the main driver of labour productivity growth in the market sector between 2001 and 2015, with higher growth in MFP than in most peer countries, including Denmark, Germany and Sweden (Ministry of Finance, 2020).

A 2021 report noted that R&D spending in Finland had been remarkably weak since 2009, leading to the country falling behind peers such as Germany and Sweden (Ministry of Finance, 2021a). It found that this was mainly due to a strong decline in business spending, and the result of the collapse of the electronics industry in Finland and Nokia's difficulties. Moreover, this shock delayed the reallocation of R&D resources to other business sectors that were not as badly affected. The report also suggested that the productivity of R&D inputs has declined, implying that the same R&D inputs generate fewer innovations than before. To strengthen R&D spending, it pointed to the role of possible instruments such as increased public funding for R&D, and stronger incentives for private firms to invest in R&D. The report also pointed to the importance of skilled labour in strengthening R&D spending and pointed to the role of education policies and actions to attract global talent through immigration policies. It also noted the importance of a well-functioning innovation system, with strong cooperation and effective division of labour between firms and universities, noting that direct public support through grants for such cooperation may be a more effective policy instrument than R&D tax incentives. A second 2021 report noted that a lack of high-productivity firms implies a need for more attention to innovation activities, notably for more radical innovation projects (Ministry of Finance, 2021b).

France

The 2019 report identified performance in innovation as a factor that might help explain the more pronounced slowdown in productivity in France (Conseil National de Productivité, 2019). It pointed to relatively low investment in R&D from the private sector, and the role of structural features such as a relatively limited role of industry. It also pointed to possible differences in the efficiency of R&D in France, and a lack of interaction between public and private research.

Germany

Germany's 2019 report questioned whether the growing complexity of research and innovation might have pushed up the costs of innovation in Germany and at the global level, possibly affecting productivity growth (Sachverständigenrat, 2019). The 2020 report devoted attention to the role of innovation for productivity growth (Sachverständigenrat, 2020). It pointed to the importance of innovation for MFP growth, noting that business spending on

innovation in Germany is highly concentrated among large firms with relatively little spending by small and medium-sized firms. The report pointed to barriers to accessing skilled labour and innovation funding, including low availability of venture capital funding that could affect the formation and growth of innovative start-ups. Its analysis pointed to the respective role of different actors in the German innovation system, including public research institutes, private firms and innovative start-ups. The report provided several recommendations, notably to a) improve incentives for SMEs to invest in innovation; b) expansion of the European Research Area; c) improve the transfer and diffusion of knowledge and technology; d) improve access to public sector data to enable the development of new business models; e) better embed innovation criteria in the public procurement process; and f) increase the availability of private venture capital.

Ireland

The 2021 report pointed to the importance of investment in R&D and innovation for productivity and competitiveness and noted that Ireland was considered a "strong" innovator in the EU, ranked eleven in the EU's 2021 Innovation Scoreboard (National Competitiveness and Productivity Council, 2021). The report pointed to the decline in R&D intensity as a share of GDP (and GNI) since 2012 and pointed to the ongoing process to develop a renewed innovation strategy in 2021 that envisages a more coherent and joined-up innovation eco-system. It supported the publication of Ireland's innovation strategy by the end of 2021, which would articulate steps to make Ireland a global innovation leader, while ensuring the alignment of R&D and innovation activities with public policy goals.

The 2022 report noted the challenges for Ireland and the release of a new research and innovation strategy in May 2022, entitled *Impact 2030: Ireland's Research and Innovation Strategy*. The strategy is composed of five pillars which aim to maximise the impact of: research and Innovation on the economy, society and the environment; research and innovation structures focussed on excellence and outcomes; innovation on enterprise success; talent at the centre of the research and innovation ecosystem; and research and innovation on Ireland's all-island, EU and global connectivity. The strategy is accompanied by a range of key metrics and includes the establishment of a new statutory research and innovation funding agency which will bring together the functions and activities of the Irish Research Council and Science Foundation Ireland. The report recommended adequate resources and immediate implementation of the government's innovation strategy and recommended that the proposed new research bill be passed without delay. This included the establishment of a new research and innovation funding agency to drive and fund research, and in particular interdisciplinary research.

New Zealand

The Productivity Commission explored the role of innovation policy in a 2021 report supporting its inquiry on frontier firms (Crawford, 2021). The report noted how New Zealand is lagging other small advanced economies (SAEs) in several areas, including exports relative to GDP, internationally significant patenting, business R&D expenditure, scientific publications and world-class universities, collaboration between businesses and researchers, the number of large firms, as well as the complexity of its export package. It suggested that

government should learn from the experience of other SAEs in establishing a high-level multistakeholder strategy body to help set strategic directions for its focused innovation policy (Crawford, 2021). Moreover, the report recommended that the government commit substantial long-term funding to support the strategy and devolve governance in chosen areas of focus to independent multistakeholder bodies. The report noted that in learning from other SAE countries, New Zealand should tackle areas where there are binding constraints to growth performance and make more focused investments in areas such as skills, including management, as well as innovation. The report also noted that New Zealand's past and present attempts at focused innovation policy have lacked scale, resources and durability to be effective and that firms face a wide choice in programmes and points of contact if they seek government assistance. Moreover, it noted these have been based on government-driven processes, and not on design and governance involving multiple stakeholders which could have generated greater momentum and made better use of available knowledge and capabilities.

The 2021 inquiry into frontier firms built on these results and made many recommendations on innovation policies (New Zealand Productivity Commission, 2021). It recommended that the government and relevant agencies carry out a stocktaking of the operation of the country's R&D tax incentive scheme to assess difficulties in accessing the scheme; assess whether it is meeting its objectives; identify and implement possible amendments; and consider supplementing the scheme with the use of grants. It also noted that the government should adequately resource and support public sector procurement professionals and local firms to build innovation capacities. Moreover, it recommended allocating a significant part of the budget for the research, science and innovation strategy to support the development of linkages in the innovation eco-system. In addition, it recommended reviewing the programmes designed to assist firms with innovating and exporting, aimed at reducing and consolidating their number; simplifying processes; and making it easier for firms to identify and access relevant programmes.

The 2021 inquiry also recommended the development of a focused innovation policy aimed at areas with high potential to complement its broader innovation policy. It noted that government should partner with stakeholders to confirm the choice of a small number of areas to focus such efforts and support these areas with a substantial and enduring resource commitment, conditional on matching resources from the private sector. It noted that this would require the development and implementation of transparent arrangements for the governance, implementation, monitoring and evaluation of such policies, as well as the development of skills and capacities in the public sector to implement such policies. It also recommended a review of funding for key agencies and efforts to strengthen the innovation ecosystem in the areas of focused innovation policy. It also recommended that the government update and confirm its existing research, science and innovation strategy to signal its intended innovation effort and direction over the next 5 to 10 years; that the government engage with stakeholders to development a transparent implementation plan for its strategy; and the government commission a comprehensive independent review of New Zealand's innovation policies.

The inquiry report also included an extensive assessment of Māori firms and insights as regards the specific barriers and challenges for innovation faced by these firms, and made extensive recommendations to support productivity, innovation and resilience in these firms.

Portugal

The 2019 report noted that despite progress in many areas, a gap remains between Portugal and other European countries in R&D and innovation (Conselho para a Produtividade, 2019). While investment in R&D has grown, much of this is concentrated in the public sector, notably universities, with an insufficiently strong link to business needs. Moreover, collaboration in R&D and innovation, both between firms and between firms and research institutions, is relatively low and concentrated in large firms. The report noted that the OECD had recommended to reform the R&D tax incentive scheme, as this currently favours profitable firms, not necessarily the most innovative firms (OECD, 2019; Conselho para a Produtividade, 2019). It recommended further work to evaluate the effectiveness of policies to encourage investment in innovation, in particular R&D.

The 2020/2021 report documented work undertaken by the board on the SIFIDE programme, Portugal's system of R&D tax credits (Basto, et al, 2021; Conselho para a Produtividade, 2021). The results demonstrated the effectiveness of the system in promoting business investment, both as regards expenditure and personnel involved in R&D. The work also noted that these impacts were persistent and found no crowding out between public and private investment. The report also noted the particularly strong impacts of the programme on micro and small firms, as well as the services and ICT sector. Finally, it found very significant impacts of the programme on firms that have repeatedly used the programme.

United Kingdom

The first report of the UK Productivity Commission pointed to the important role of innovation for productivity performance (NIESR, 2022). It noted the importance of knowledge hubs, collaboration and open innovation for innovation. It also pointed to the lack of technology diffusion from leaders to laggards, the lack of collaboration between business and universities, and a lack of absorptive capacity in many businesses. As regards policy, the report pointed to public support for innovation; the involvement of firms in networks and collaboration, including open innovation; as well as the creation of new global centres of excellence.

4.4 Digitalisation

Issues related to digitalisation and the contribution of digital technologies to productivity are related to the discussion on innovation and technological change and are a growing theme in the work of several productivity commissions. Some of this work has addressed relatively new topics in the productivity literature, such as the role of data as an asset and the potential contribution of telework to productivity.

Australia

The 2022 five-year review recognised the potential of data and digitalisation to improve productivity, by reducing production costs (such as search, transportation and verification costs), and by improving productivity quality and consumer choice (Productivity Commission, 2022b). It also acknowledged that the COVID-19 crisis had accelerated digitalisation. It pointed to the large variety of digital uptake across the economy, e.g., with large firms more likely to adopt advanced technologies than small ones; businesses in remote regions less likely to use certain digital technologies, e.g., customer relationship management; and differences across industries linked to their specific needs. The report also noted that Australia is doing well on many basic measures of digital technology uptake, but lags on more advanced use, e.g., artificial intelligence (AI) and data analytics. It pointed to several barriers affecting the uptake of digital technologies, notably inadequate access to the Internet linked to poor connectivity in regional and remote areas; lack of skills; limited awareness and uncertainty about benefits; as well as costs and legacy systems, that were mainly considered a barrier for medium and large firms. It also pointed to specific issues linked to the digital environment, such as insufficient clarity about rules related to data access and rights, as well as costs related to cybersecurity.

To support greater technology uptake and greater benefits from digitalisation, the review recommended: a) infrastructure funding arrangements that provide greater flexibility and offer reliable Internet solutions for regional and remote areas; b) enhanced access to data by providers of government-funded services; c) actions to meet skills needs, with a specific focus on skilled migration policies aimed at meeting employers' needs; d) attention to the secure use of technology and data to ensure that trust does not become a barrier to adoption; e) consideration of government's role in the ethical use of data; f) better coordination of digital-related policies to reduce overlap and inconsistencies, and lower uncertainty for business.

Belgium

The 2020 report noted that the COVID-19 crisis had given an extra stimulus to the digitalisation process (National Productivity Board, 2020). The use of digital technologies was considered a strong driver of productivity growth. Moreover, further digitalisation was also considered to contribute to solutions for several complex challenges facing society (e.g., health care, carbon neutrality, the transition to renewable energy generation, etc.). The report noted that it was important to take advantage of the momentum of the COVID-19 crisis to further accelerate the digital transition by encouraging investment in these technologies, and focusing on complementary investments in skills (such as digital and management skills), organisational innovation and management capacities, a fast, secure and reliable broadband infrastructure, a new digital culture, e-government, and regulation aligned with the digital economy (National Productivity Board, 2020). It also pointed to the potentially negative consequences of digitalisation (e.g., linked to security and privacy) and the need for a just transition.

France

The 2019 report identified the lag in ICT adoption and diffusion as a factor that might help explain the more pronounced slowdown in productivity in France (Conseil National de Productivité, 2019). It also noted that, in turn, this gap might be linked to other factors, including management and organisational practices, strong rigidities in the French labour market, and regulatory barriers in the product market.

The 2022 report explored the role of telework for productivity in some detail (Conseil National de Productivité, 2022). It noted the strong growth in teleworking during the COVID-19 crisis, from 4% of all employees in 2019, to up to 37% of all workers during the period from March 2020 to January 2021, on a regular or irregular basis. The report explored the several factors that influence the potential productivity impacts of teleworking, including changes in autonomy and working conditions. It found that firms that increased their telework in 2019 were on average more productive and had also been more resilient during the crisis. Extrapolating the results of this study would suggest that increased telework could increase productivity in France. Considering all the different factors, the report concluded that teleworking is likely to have a very varied impact on the attractiveness of jobs, working conditions, the split between full and part-time work, with uncertain impacts on aggregate productivity. It also pointed to possible impacts through greater co-investment in digital technologies; the spatial reorganisation of work; increased access to human resources due to telework; as well as impacts on existing inequalities between occupations and sectors.

Germany

The 2019 report discussed the productivity paradox and ICT use and pointed to German studies that ICT had two offsetting impacts in Germany (Sachverständigenrat, 2019), suggesting that the increase in labour productivity due to ICT use was offset by greater demand for labour with lower average productivity due to diminishing marginal returns. The report also pointed to the delayed adoption of ICT in Germany and low levels of investment that might explain the limited observable productivity impacts of ICT thus far.

The 2020 report noted that digitalisation provides a substantial potential to raise productivity across the economy (Sachverständigenrat, 2020). However, it noted that Germany is a leader in the European Union but lags global leaders such as Korea and the United States. It noted that further action is needed to ensure the diffusion of digital technologies across firms and the public sector and support the development of digital and data-driven business models. It also explored the impact of the COVID-19 crisis on digitalisation, including in sectors such as health, education and public administration, and the macroeconomic impacts on productivity. The report provided several recommendations, along two main areas, namely a) to improve framework conditions for digital services and business models, and b) to address deficits in the digitalisation of public administration, healthcare and the education system. Specific actions under the first area included greater investment in digital infrastructure, including through addressing bureaucratic barriers such as lengthy approval procedures; increased teaching of key digital skills in schools and better lifelong learning opportunities; and reforms to competition rules, including with respect to data interoperability and portability, to ensure contestability, competition and openness in digital

markets. It also noted that the digitalisation of administration could provide significant demand stimulus and that the European digital single market should be deepened to support the growth of innovative start-ups. The report also pointed to the growing importance of cyber and data security.

The 2021 report noted that the COVID-19 crisis had significantly advanced digitalisation and boosted demand for data-driven services (Sachverständigenrat, 2021). It pointed to three key trends: a) the growing importance of data in creating value added and changing value-added processes; b) the emergence of platforms as the dominant business model in the data economy; c) the importance of cloud ecosystems as the technological underpinning for the data economy. It argued that the development of the digital economy in Germany is hampered by several barriers, including skills shortages for digital innovation, and security concerns linked to the storage of sensitive information by cloud providers. The report provided five recommendations: a) encouraging greater data access and sharing in Germany and the European Union; b) strengthen competition in the online platform economy; c) strengthen consumer protection in the data economy; d) consider developing technological sovereignty as an area of economic policy, aligned with market economy principles; e) better coordinate initiatives to enhance cyber security.

Ireland

The 2021 report discussed the opportunities linked to remote working for productivity (National Competitiveness and Productivity Council, 2021). It discussed the various channels through which telework could improve productivity and noted that it would take time before the full impacts on productivity became apparent. It reported evidence from a survey where 68% of respondent employees agreed that remote working had increased their self-reported productivity. Moreover, another survey of Irish human resources managers found that three-quarters said that productivity either increased or remained steady once remote working had become the norm. The report also noted that new opportunities for more flexible working have the potential to convey a range of economic, social and environmental benefits, including a better quality of life for those living and working in Ireland. It also drew on OECD work in pointing to a range of policies that could help maximise the gains of teleworking for productivity and innovation, while minimising the risks to workers' wellbeing (OECD, 2020). In the context of Ireland, the report pointed to several priorities, notably: digital infrastructure, notably high-speed broadband networks, where Ireland still has shortcomings compared to the top-performing economies; digital and managerial skills; and digitalisation policies more generally. On remote working, it recommended the drafting of new legislation on the right to request remote working. It also recommended simplification of the process of claiming expenses to working from home and clarifying the expenses that could be claimed. On digital infrastructure, it argued for greater certainty for individuals and businesses as regards the roll-out of the National Broadband Plan.

The 2022 report pointed to a relatively low use of advanced digital technologies by the business sector compared to European front-runners such as Denmark and Finland (National Competitiveness and Productivity Council). The report noted the release of a new digital strategy for Ireland in February 2022. The strategy provides a high-level plan for Ireland to become a digital leader, and includes actions related to digital transformation of business,

digital infrastructure, skills and the digitalisation of public services. It includes a commitment for a highly coordinated and coherent strategy across the government. The report recommended adequate resources and immediate implementation of the strategy, with annual reporting on progress and transparent identification of all barriers affecting implementation.

Portugal

The 2020/2021 report noted a growing productivity divergence between sectors and firms linked to the COVID-19 crisis as the most productive firms and those investing most in intangible assets were better able to use new digital technologies (Conselho para a Produtividade, 2021). It noted that this could point to distortions related to the diffusion of knowledge and technologies.

United Kingdom

The first report of the UK Productivity Commission did not devote specific attention to the role of digitalisation for UK productivity performance but noted the growing importance of working from home following the COVID crisis, and a resulting potential for increased productivity growth (NIESR, 2022).

4.5 Entrepreneurship, business dynamics and resource allocation

While entrepreneurship and business dynamics have long been considered important drivers of productivity, it has only recently become an important element in the analytical toolbox of productivity commissions, thanks to greater access and availability of microdata. Key issues that have been considered by productivity commissions are the contribution of entry, exit and firm growth to productivity; productivity convergence and divergence, including the role of leaders and laggards, including so-called zombie firms; the role of frontier firms for productivity; and the contribution of resource allocation to aggregate productivity growth.

Belgium

In 2019, the NPB pointed to several structural features of Belgium's economy limiting productivity growth, notably a low rate of resource allocation compared to several other EU countries, a very low (one-but-lowest in the EU) rate of new firm creation, and the lowest rate of firm exit among EU countries, suggesting that some "zombie firms" were artificially kept alive due to relatively abundant finance (National Productivity Board, 2019). It also pointed to a very low share of high-growth firms. The report also pointed to a growing divergence in productivity growth between leaders and laggards, while noting that the country had several global productivity leaders. Many of these firms were engaged in international trade, and those not directly engaged in international trade were often exposed through supply chains to firms that were engaged in such trade (National Productivity Board, 2019).

The 2021 report pointed to new research showing that many innovative start-ups in Belgium struggle to reach a sufficient scale (National Productivity Board, 2021). Moreover, young firms appear to have greater difficulties than before to catch up with the average level of

productivity of incumbents. The 2021 report did not yet find evidence that the COVID-19 crisis had led to excessive firm exit, or to a sharp decline in new firm creation.

Policy-wise, the 2020 report noted the importance of favourable conditions and incentives for young innovative start-ups, including in helping them scale (National Productivity Board, 2020). This includes providing greater certainty about demand through public procurement, support for innovation that is better adapted to young and small firms; appropriate financing for start- and scale-ups, and the stimulation of an entrepreneurial culture. It also pointed to the need to reduce administrative burdens, improve the quality of regulation and provide better digital public services to businesses. The report also pointed to the need to remove exit barriers for unviable businesses when governments are supporting such businesses financially, as it considered this an implicit tax on healthy businesses. The 2021 report pointed to recent reforms to bankruptcy legislation in 2018 and to judicial reorganisation procedures in 2021 as policies that might facilitate exit (National Productivity Board, 2021).

Denmark

The Danish productivity board examined issues related to business dynamism in the context of its work on the COVID crisis (De Økonomiske Råd, 2021). It noted that the economic support packages that the government had introduced were designed to protect existing businesses, not new ones, risking an entrenchment of the prevailing business structure. It also noted that the support packages had the unfortunate effect of also protecting unprofitable businesses that might have exited the market even in the absence of COVID. The 2022 report provided recommendations on how to design support packages in the case of future economic crisis situations (De Økonomiske Råd, 2022). It provided its views on the recommendations by a working group on principles for such packages. It agreed with some, notably as regards the use of such packages in crisis situations. It disagreed with the working group on its preference for general support schemes over more targeted schemes, as it found that general schemes might weaken structural adjustments in the economy.

Finland

The 2020 report devoted considerable attention to the role of creative destruction for productivity (Ministry of Finance, 2020). It pointed to the important role of creative destruction for productivity, noting that creative destruction had been weaker in Finland than in Sweden, although it had improved in recent years in private services. It suggested that greater investment in R&D and the greater use of ICT services inputs might have contributed to this development. It pointed to the key role of creative destruction and resource allocation in a context of global competition and changes in technologies. It also pointed out that taxation and business subsidies can cause distortions to resource allocation that can affect productivity.

The report pointed to several policies that can strengthen creative destruction (Ministry of Finance, 2020). This includes innovation policies that provide important preconditions for productivity growth, and policies to disseminate information and know-how. It also included successful competition policies that encourage firms to engage in innovation and support the reallocation of labour and other resources to the most productive firms. Moreover, education

and training policies can be used to improve the efficiency of knowledge creation and its productive utilisation and diffusion across firms. The report also pointed to the important role of labour mobility in the process of creative destruction and pointed to housing and regional policies, as well as labour market policies and labour market flexibility as important policy levers. The reallocation of capital to its most productive uses can also be supported by policy action, including by well-functioning and versatile capital markets, and policies related to taxation and corporate subsidies that do not hinder the reallocation of resources between firms in a way that could affect creative destruction.

A 2021 report showed that, unlike in other countries such as the United States, business dynamics in the manufacturing in Finland did not decline over the past three decades (Ministry of Finance, 2021a). Moreover, business dynamics in private services increased to a level above that in the United States. The report noted that access to funding does not seem to be the main problem for SMEs and business dynamics (Ministry of Finance, 2021a). It found that lack of skilled personnel and competent management may be more important, requiring attention for education and migration policies. Moreover, while general funding may not be a constraint, access to funding for R&D by young innovative firms was considered a factor.

A second 2021 report found a high diversity of productivity among firms, and that Finland's problem is not so much many low-productivity firms, but a lack of high-productivity firms relative to other countries (Ministry of Finance, 2021b). It also noted that resource allocation was poor, with the most productive firms operating on too small a scale considering the size of the national economy. Moreover, the report found that resource allocation had worsened, with a slight improvement in recent years, with labour moving away from the most productive firms to the less productive ones.

The 2022 report noted that competition and business dynamics are not the causes of poor productivity growth in Finland, with studies showing that the reallocation of labour has generally boosted productivity in Finland (Ministry of Finance, 2022). It noted that many firms were operating with too high a level of capital intensity, but that high-productivity enterprises do not receive a large enough share of the labour force, whereas low-productivity firms receive too large a share.

France

The 2021 report explored issues related to business dynamics and reallocation in the context of the COVID crisis (Conseil National de Productivité, 2021). It pointed to the significant decline in bankruptcies as emergency and recovery measures ensured the survival of many firms, some of which might be unviable. The report pointed to two key risks; a) bankruptcies of productive or systemic firms that might have knock-on effects on value chains; b) overprotection of unviable firms, leading to so-called "zombie" firms with possible impacts on reallocation of resources towards more productive firms. The report considered the first risk larger than the second.

The report also discussed the unwinding of government support measures following the COVID-19 crisis and its impact on business dynamics, resource allocation and productivity (Conseil National de Productivité, 2021). It noted that support measures have kept many firms

in “hibernation”, which has increased their debt levels which will put these companies (and aggregate growth and productivity) at risk when the situation returns to normal. The report set out several options to unwind support, reduce debt levels and ensure a separation between viable and non-viable firms, involving different levels of state involvement and support. It argued for better quality information on business difficulties so company restructuring can be monitored in real time, and for a detailed and sectoral monitoring of different types of corporate debt. This would help to better target support, prepare for the unwinding of emergency measures and identify necessary debt reductions.

The 2022 report explored the role of reallocation for France’s productivity performance, including within industries (Conseil National de Productivité, 2022). It found that the overall slowdown in productivity is more pronounced for firms at the productivity frontier, suggesting a declining contribution of technological progress to productivity. The simultaneous slowdown of productivity growth in lagging firms also suggests a slowdown in the rate of diffusion of productivity from the best performing firms. The report also noted that the renewal of firms at the frontier had slowed down, which may point to reduced competitive pressures, and found an increase in productivity divergence between frontier and lagging firms. The report also explored the role of reallocation for productivity growth and found differences across industries, such as a lower reallocation rate in industries with a high share of ICT and lower reallocation in import-intensive sectors. It also looked at industry-level differences in productivity dispersion, and found that dispersion declined in high-tech services, while it increased in low and medium technology services.

Germany

The 2019 report explored the role of business dynamism for productivity (Sachverstandigenrat, 2019). It noted that Germany’s slow population growth may be among the factors explaining its low start-up rate. It also pointed to growing market concentration, though noting that this might not be due to a weakening of competition or competition policy but could be linked to new technologies and the growth of intangible assets in the production process that are enhancing the importance of economies of scale. It also pointed to the high fixed costs of regulation that could benefit large firms over small firms and crowding-out effects linked to globalisation. It also pointed to regulation in the labour market and market access barriers in the services sectors as areas where improvements might be possible (Sachverständigenrat, 2019). However, it also noted that certain recent policies had increased market access barriers, e.g., in postal services and for master craftsman’s qualifications.

The 2021 report found that the number of job losses and business closures during the COVID-19 crisis was lower than in previous recessions, leading to a decline in reallocation dynamics (Sachverständigenrat, 2021). The report did not expect a substantial catch-up effect to this development. It attributed this development to a range of government policies, such as support measures for firms, the extension of a short-term working scheme, and the suspension of the obligation to file for insolvency, all aiming to bridge the temporary shock of the crisis and protect viable firms and jobs. It noted that, in the follow-up to the crisis, it is important to improve the efficiency of market-based allocation mechanisms. It recommended: a) reforms to insolvency and restructuring laws to improve the process of market exit; b) actions to reduce debt levels of small firms by transforming existing liquidity

support, thus supporting investment and a return to economic normality; c) better support for innovation and growth-oriented start-ups; d) more targeted support for the reallocation of workers.

Ireland

The 2021 report explored the indigenous SME sector that includes both high- and low-productivity SMEs (National Competitiveness and Productivity Council, 2021). It suggested further research and pointed to opportunities for closer links between the strong MNE sector in Ireland and indigenous SMEs, for example through trade links, labour mobility and innovation cooperation, and to closer links between research institutions and SMEs.

Netherlands

The 2021 report pointed to issues related to productivity divergence and business dynamism (CPB Netherlands Bureau for Economic Policy Analysis, 2021). It noted that there is no evidence of productivity divergence between frontier and lagging firms in the Netherlands. Moreover, it found that the churn of firms – the sum of entry and exit – had declined, mainly due to a declining entry rate from 2006 onwards, with a stronger decline in manufacturing than in services. The report noted that the entry of new firms contributed positively to productivity growth in the services sector, but that incumbents drove the bulk of productivity growth in the manufacturing sector.

New Zealand

The 2021 inquiry into frontier firms found that productivity levels in New Zealand's frontier firms were considerably below those in other small advanced economies (New Zealand Productivity Commission, 2021). However, it also found that the productivity gap between its frontier and non-frontier firms did not change significantly between 2003 and 2016, in contrast with many European countries where the gap increased. This could indicate that technology diffusion in New Zealand has been relatively effective but could also reflect the relatively low productivity levels of frontier firms and low growth rates, which makes it easier for non-frontier firms to keep up. The report also noted that non-frontier firms in European countries benefited from productivity growth in frontier firms in other countries. This effect could not be identified in New Zealand, which likely reflects its distant location, which acts as a barrier to the diffusion of tacit and non-codified technologies. The report also noted that European frontier firms are more capital intensive than New Zealand's firms, reflecting the relatively low capital intensity of New Zealand's economy, and employ more people than firms in New Zealand. The report also devoted special attention to the challenges faced by Māori firms.

Portugal

The 2020/2021 report pointed to the experience of previous international crisis situations as regards the potential emergence of so-called "zombie" firms, that could affect resource allocation in the economy (Conselho para a Produtividade, 2021). It examined the role of resource allocation in more detail in a separate study (Simoes, et al., 2019). This work

identified firms and sectors where misallocation was the most severe, evaluated the contribution of productivity growth in achieving a more efficient allocation of resources, and explored the literature of frictions that might affect the allocation of resources. The report noted the need to better understand productivity divergence in the economy, which would help identify the potential contributions of better resource allocation and of improvements in mechanisms that affect the diffusion of technologies across the economy.

United Kingdom

The first report of the UK Productivity Commission noted that the UK had done relatively well compared with many other OECD countries in reallocation, with most resources going to the most productive firms (NIESR, 2022). However, some research pointed to declining labour mobility. It also noted that the UK evidence on productivity leaders and laggards differs from that in most OECD countries, with the UK productivity problem concentrated among the leading firms, rather than the laggards.

4.6 Summary and concluding remarks on direct drivers of productivity

As noted already in section 2 of this paper, there is considerable diversity in the work of the various productivity commissions. Some mainly provide analytical insights for use by policy makers, e.g., Finland, the Netherlands and Portugal; others also provide relatively high-level policy recommendations, e.g., Belgium and France, whereas a third group are more prescriptive, e.g., Australia, Denmark, Germany, Ireland and New Zealand. Despite these differences, and with a few gaps, the ten productivity commissions reviewed in this paper have generally all explored the five direct drivers of productivity discussed in this section, i.e., investment, human capital, R&D and innovation, digital transformation and entrepreneurship and business dynamics (Table 2). The first report of the UK Productivity Commission also covers all these issues (National Institute of Economic and Social Research, 2022). Some differences can be observed, though.

As regards investment, some boards have explored the slowdown in business investment and low levels of capital intensity in macroeconomic terms, e.g., Australia, Finland, New Zealand and Portugal. Others have mostly focused more on specific components of investment, e.g., investment in intangible assets and ICT capital, e.g., Germany and the Netherlands. France has thus far devoted relatively little attention to investment-related issues in their work, while Belgium, Denmark and Ireland have had a strong focus on the role of public infrastructure in their annual reports, with Denmark focusing on transport, and Ireland on public infrastructure more generally, including energy and broadband. Ireland is the only country that has taken a broad perspective on infrastructure, in also examining housing and its links to productivity.

Considering its importance, productivity boards have devoted relatively little attention to addressing the slowdown in aggregate investment, possibly since they consider it a structural factor, not easily influenced by national policy. Only some boards (notably Belgium and Finland) explicitly explored the links between macroeconomic policy, investment and productivity in their work, while Portugal was the only country emphasizing financial markets.

Human capital and skills are among the most consistently covered topics by productivity commissions, with some countries focusing on general education and skills levels (Australia,

Finland, France, Portugal), with others focusing more on specific skills, such as digital and managerial skills (Australia, Belgium, Finland, France, Germany, Ireland, New Zealand and Portugal). How to foster lifelong learning is another core question addressed by several boards (Australia, Belgium, Germany). Attractiveness to foreign talent and policies linked to migration have also been addressed by some boards, e.g., Denmark and New Zealand. Several countries have also explored skills mismatch (Belgium, France, Ireland, New Zealand and Portugal). Research by France suggests that the role of human capital for productivity growth is much larger than suggested by growth accounting.

R&D and innovation are also covered by most productivity commissions in their work, often in the context of enhancing understanding of the slowdown in multifactor productivity over the past decades. Important areas of focus are how to strengthen private investment in R&D, e.g., through R&D tax credits (Belgium, Denmark, Finland, France, Ireland, New Zealand, Portugal), the diffusion of innovation (Australia), and how to strengthen the national innovation system (Australia, Belgium, France, Germany, Ireland, New Zealand and Portugal). More specific issues include innovation in non-market services (Australia), data access and availability (Australia), concentration in innovation activities (Belgium, Germany and Portugal) and the productivity and costs of R&D (Finland, France and Germany). Surprisingly, given its prominence in the debate on productivity, only few boards, except for Australia and Belgium, have explored how to strengthen technology diffusion.

Digitalisation has explicitly been addressed by seven out of ten productivity boards in their recent work, linked to the ongoing digital transformation, but also focused on specific topics, such as the role of digitalisation and telework following the COVID crisis (Belgium, France, Germany, Ireland and Portugal), the contribution of diffusion and advanced technology use to productivity (Australia, France, Germany, Ireland and Portugal), and the role of data in enhancing productivity growth (Australia and Germany).

Entrepreneurship, business dynamics and resource allocation are the final topics that have recently been addressed by most productivity boards, reflecting a growing understanding of the role of business dynamics for productivity and growing data availability, as well as its high relevance in the context of the COVID crisis (e.g., in the work in Belgium, Denmark, France and Germany). Understanding the productivity divergence between leading and lagging firms, and the role of creative destruction (including the role of so-called “zombie” firms) for productivity are core components in much of the work. Relatively few boards, except for Ireland’s, have focused specifically on the role of SMEs for productivity. New Zealand has had a specific policy focus on frontier firms, whereas some other boards have focused more on laggards, i.e., the so-called zombie firms (Belgium, Portugal). Barriers to entry, exit and creative destruction are another recurring policy theme (Belgium, Finland, France, Germany).

Many of these issues are also reflected in the first report of the UK Productivity Commission (National Institute of Economic and Social Research, 2022), although with some differences in emphasis (Table 2). For example, issues related to digitalisation and business dynamics have thus far been less reflected in the UK work than in the work abroad.

A few broader issues stand out in the work on direct drivers of productivity:

- First, considering its importance, relatively little attention has been devoted to policies to address the **slowdown in aggregate investment**, possibly because it is considered a structural factor, not easily influenced by national policy. Macroeconomic policies affecting investment are only explored by some commissions, as is the role of financial markets.
- Second, human capital is by some margin the most widely explored driver of productivity. This strong focus suggests that the boards consider **its role for productivity growth much more important than suggested by growth accounting**, possibly due to the strong complementarities with investment in tangible and intangible capital. Lack of skills and skills mismatch emerge as key barriers to productivity growth in many countries.
- Third, while innovation and technology have been explored by many boards, little work has been done **on how to strengthen technology diffusion or address the overall pace of technological progress.**
- Finally, although a relatively new issue, most boards have explored several dimensions of business dynamics and understand its importance for productivity. Although several countries indicate challenges linked to frontier firms, the boards have given more policy advice on laggards and "zombie" firms than on **policies to drive productivity in frontier firms**.

Table 2: Key themes in the work by productivity boards on direct drivers of productivity

	Tangible and Intangible Capital	Human Capital	R&D and Innovation	Digitalisation	Entrepreneurship & business dynamics
Australia	Macro drivers of business investment, Structural factors, Social Benefits	Foundational and Specific Skills, Life-long Learning, School Productivity	New to the World Innovation versus Diffusion, Non-Market Services	Uptake Advanced Technologies Data economy, Intellectual Property, Infrastructure	
Belgium	High-Quality Infrastructure, Digital & Green Transition and R&D, Public Budget, FDI	Skills Mismatch, Retaining Talent, Lifelong Learning, STEM skills	R&D Concentration, Tax Credits, Innovation System, Diffusion	Digitalisation and COVID, Complementary Investment, Just Transition	Firm Dynamics & COVID, Zombie Firms, Scaling, Productivity Divergence
Denmark	Public Infrastructure, Cost-Benefit Analysis, Targeted Support for SMEs	Relocation of Education & Training, Foreign Labour	R&D Tax Credits		COVID and Firm Dynamics, Support Schemes
Finland	Capital intensity, Role Demand and Business Cycle	Structure Labour Force Management Skills	Incentives for Private R&D, Productivity of R&D, Radical Innovation		Creative Destruction, Growth SMEs, Resource Allocation, High-Productivity Firms
France		Quality of Education, Soft Skills, Management and Diversity, Inequalities, Skills Mismatch	Investment in R&D, Structural Factors, Efficiency of R&D, Public-Private Links	Telework and Productivity, Co-investment in Digital Technology, ICT Diffusion	Business Dynamics & COVID, Unwinding Support, Productivity Divergence, Frontier Firms
Germany	Infrastructure, Intangibles, Fiscal Policy, Equity Finance	Lifelong Learning, Equality of Opportunity, Management Skills	Innovation System Concentration, Costs and Complexity of Innovation	Impact COVID, Data economy, Platforms, Cloud, Sovereignty, Digital Infrastructure	Firm Dynamics & COVID, Allocation, Support Policies, Market Access, Demography
Ireland	Digital, Transport & Energy Infrastructure, Housing, Planning	Digital and AI Skills, Green Skills, Management Skills Skills Gaps & Mismatch	R&D Intensity, Innovation Strategy, Research and Innovation Funding Agency	Broadband Plan and Advanced Technology Use Telework and COVID	Indigenous SMEs, links to MNEs and Research Institutions
Netherlands	Intangibles Digital technologies			Digital technologies	Business dynamics Productivity divergence
New Zealand	Capital Intensity, Macro Drivers of Investment	Talent, Management and Leadership, Immigration, Skills Mismatch	R&D Tax Credits, Procurement, Focused Innovation Policy		Frontier Firms, Productivity divergence, Technology Diffusion
Portugal	Investment Dynamics, Financial Constraints of Firms	Disparity in Qualifications Skills Mismatch, Entrepreneurial Skills	Collaboration, R&D Tax Credit Scheme, Innovation System, R&D Concentration	Digitalisation and COVID, Technology Diffusion	Productivity divergence Zombie Firms, Resource allocation, Diffusion
United Kingdom	Investment Policies, Tax Breaks, Infrastructure Plan	Skills, Training Management, Skills Mismatch	Innovation, Diffusion, Collaboration, Centres of Excellence	Homeworking	Reallocation, Frontier firms, Labour mobility

Source: Section 4 and reports of national productivity commissions (see references).

5. Indirect drivers of productivity

This section explores work by productivity commissions on the key indirect drivers of productivity and the related policies, i.e., globalisation (trade, FDI and engagement in global value chains); the business environment, including competition and regulation; structural features and industrial policies; the regional dimensions of productivity; the role of energy and environmental factors for productivity; the role of labour markets for productivity; and some other issues that have been explored by productivity commissions. A final section summarises the work, including in comparing with the UK work, and draws some conclusions.

5.1 Trade, FDI and global value chains

Trade and foreign direct investment have long been considered important drivers of productivity linked to their impacts on competition, specialisation and economies of scale, amongst others. Productivity commissions have looked at issues related to trade and trade policies, including trade in services; attractiveness to foreign direct investment; and engagement in global value chains for productivity growth.

Australia

The 2022 productivity review pointed to the importance of trade and investment for future productivity growth and greater economic resilience (Productivity Commission, 2022a). It noted how reforms to trade and investment policies over many decades had opened Australia's economy to international competition, and allowed it to benefit from globalisation, e.g., through efficiency gains by domestic producers and shifts in comparative advantage. The review also pointed to a range of uncertainties that have affected trade in recent years, including the COVID-19 crisis, protectionism and trade disputes, export bans linked to domestic shortages, growing geopolitical influences on trade, as well as possible policy changes linked to the climate transition.

The review pointed to several policy actions that could increase the benefits of trade and investment for growth and productivity (Productivity Commission, 2022a). This includes adjustments to the screening regime for FDI, ensuring that these appropriately account for national security concerns, but don't disincentivise investment. It also noted that application fees for foreign investors are increasingly used as a tax base. It also recommended the removal of remaining tariffs to reduce costs for importing firms and facilitate engagement in global value chains. It recommended the use of multiple regulatory and policy levers to draw greater benefits from the growing trade in services, including the removal of barriers at and behind the border, improvements to migration and FDI policy settings, and reforms to licensing regulations.

Belgium

The 2019 report pointed to the small open economy nature of Belgium, and the importance of imports and exports and integration in value chains, not only for firms directly engaged in such trade, but also their suppliers (National Productivity Board, 2019). The board noted a

substantial decline in export market share from 2000 onwards, larger than in key competitors such as the Netherlands and Germany and suggested that Belgium was too much focused on slowly growing markets, notably the EU, rather than highly dynamic markets.

The 2020 report reflected on the impact of the COVID-19 crisis on trade, firms' internationalisation strategies and global value chains, noting how trade and global value chains had been severely disrupted by the crisis and that – together with growing trade tensions – this could affect Belgium's position in global value chains (National Productivity Board, 2020). It noted that the main policy responses for these challenges need to be found at the European level, e.g., actions to strengthen Europe's position in global value chains and strengthen multilateralism.

France

The 2022 report examined the factors that influence multinationals' decisions to locate production in a certain country and found that production costs, notably labour costs, co-location effects and the fiscal environment, both as regards corporate taxes and tax incentives for R&D, played an important role (Conseil National de Productivité, 2022). It also found that relatively high labour costs, production and corporate taxes have held back the location of production sites in France, whereas a generous R&D tax credit system had a positive effect. The report also looked at factors that influence the choice of multinationals to increase or reduce their production in a country and found that the same factors play a role here as well. It recommended that France continue to develop its tax system so that it weighs less on the factors of production (i.e., labour and capital) than in other countries. It also pointed to recent measures to reduce corporate tax rates and production taxes as policies that could help improve competitiveness.

Germany

The 2019 report noted the importance of integration in the global economy for German productivity growth (Sachverständigenrat, 2019), and pointed to the importance of strengthening the multilateral trading system and avoiding protectionist trade and competition policies. At the same time, it recommended that Germany should be made more attractive as a place to do business, notably for foreign investors. It also pointed to the importance of economies of scale for productivity and noted the importance of coordination at the European level in this context. This includes the creation of a digital single market; the reallocation of resources to fundamental research; better alignment of climate and energy policy, notably deeper integration of the electricity market; and the expansion of the European capital markets union.

The 2022 report made a call to reduce dependencies and increase the resilience of global value chains by greater diversification (Sachverständigenrat, 2022). While it considered this mainly a responsibility for the private sector, government could provide targeted support for diversification, help develop strategic alliances and partnerships, and provide loan and investment guarantees to ensure the long-term supply of raw materials and support diversification. It noted that protectionist tendencies and trade-distorting practices should be countered by the EU.

New Zealand

The 2021 inquiry into frontier firms found that part of the explanation for New Zealand's poor productivity performance is the combination of its small domestic market and its distance to international markets (New Zealand Productivity Commission, 2021). The review noted that these disadvantages affect several key features of the economy, including low international flows of trade, capital and knowledge; high risks and low returns to investment in exporting; low participation in global value chains; lack of distinctive, specialised products and complexity in New Zealand's export mix; and weak competition in domestic markets. On the other hand, the review noted that the existence of a few firms in New Zealand that are at or close to the global frontier showed that it is possible to overcome these disadvantages. The report also noted the importance of foreign direct investment to innovation and exporting, and that it can provide spill-over benefits to the local economy. However, it noted that New Zealand has struggled to attract such high-quality FDI, which tends to be attracted to locations by several factors, notably the strength of national innovation ecosystems.

The inquiry recommended that the country take a more proactive and deliberate approach to attracting FDI that is innovative, export-oriented, long-term and likely to provide spill-over benefits (New Zealand Productivity Commission, 2021). It recommended including policies related to attracting FDI within a more focused innovation policy and an upgrading of New Zealand's innovation eco-system. It noted that such an approach would require careful monitoring, evaluation and adaptation to New Zealand's circumstances. It also recommended that New Zealand Trade and Enterprise, the country's trade and development agency, regularly commission independent evaluations of its services.

United Kingdom

The first report of the UK Productivity Commission also devoted considerable attention to the role of trade and FDI for productivity performance (NIESR, 2022). On trade, it pointed to the constrained demand for UK exports, which has limited the number of firms benefitting from economies of scale, competition and integration in global value chains. The report also noted that firms that engaged in exporting were typically already performing better than domestic firms, but that trade is also beneficial to productivity. As regards the constrained demand for exports, it pointed to the high costs of UK exports as a possible factor, with Brexit also being mentioned as a factor that could have increased the frictional costs of trade and increased supply side gaps for key workers. The report also pointed to the important role of FDI for productivity, and the possible positive spillover effects associated with FDI linked to knowledge diffusion from multinational firms and increased competition. Brexit was considered to affect the potential benefits associated with FDI as "new trade deals require firms to acquire information and adjust to new standards, regulations, and rules. The cost of acquiring such information is high and only larger firms tend to have the capacity to access new markets" (NIESR, 2022).

5.2 Business environment, competition and regulation

The role of the business environment, including competition and the role of regulation is another theme that has been explored by several productivity commissions. Empirical research has typically found that sound competition is a positive factor for productivity growth, whereas too much or inappropriate regulation can hold back productivity growth.

Australia

The 2022 five-year review noted that competition and business dynamism appear to have declined (Productivity Commission, 2022a). This includes an increase in overall concentration in the Australian economy; a decline in firm entry and exit rates; as well as a likely increase in mark-ups. The PC noted that these trends do not necessarily have clear policy implications, as they may be due to structural changes in markets. Moreover, it is not clear how these developments have affected consumer choice in specific markets. The review recommended to examine specific sectors and markets where consumers face limited product choice, where contestability is lacking, and where policy changes, such as government regulation and funding, could improve market outcomes (Productivity Commission, 2022a; Productivity Commission, 2022d). It also noted that competition laws need to remain fit for purpose in the current environment, and that good regulatory design can help ensure that policy reforms promote and not hinder productivity.

Denmark

The Danish Productivity Board devoted much of its 2022 report to competition (De Økonomiske Råd, 2022). It found that markups of Danish firms increased from 5 percent above costs in 2000 to 18 percent in 2018, suggesting that competition had become weaker. The increase in markups was greatest in the manufacturing sector, but there were also increases in the service sector. At the same time, the spread in mark-ups increased, pointing to greater differences between the market power of individual firms, which may contribute to a less efficient distribution of labour and capital among firms. The report also explored possible drivers for the decline in competition and found the following:

- Danish firms increased their productivity and market share when they were given better opportunities to import semi-finished products or goods for resale. Cheaper imported goods may give some firms a competitive advantage over firms not having access to such goods.
- Increased demand for export goods may have increased Danish firms' productivity and mark-ups, with demand for the types of goods produced by Danish firms increasing from 2000 to 2018. Such demand could increase productivity and markups, e.g., due to knowledge spillovers associated with trade, but mainly benefited firms that did experience higher demand for their goods, enabling them to increase market power.
- Firms benefiting most from new technologies might also be able to increase their market power, e.g., in benefiting from economies of scale in the development of software. The report found no evidence of this being the case in Denmark.

- The report found no evidence that regulation had become more anti-competitive in Denmark and noted that this cannot explain the increase in markups.

Finland

The 2021 report looked at the role of competition and regulatory policy for productivity (Ministry of Finance, 2021a). It found that profitability in the business sector had improved and found that reallocation from inefficient low-profitability firms to efficient high-profitability firms had played an important role. The effect was particularly strong in high-tech manufacturing, less so in medium-high technology sectors, and not visible in low-technology manufacturing sectors. The report suggested that less effective competition policies may have contributed to a weakening of business dynamics. It noted that Finland is a small and sparsely populated country, and that there is a risk of firms gaining a dominant position in some local markets. It noted that lack of competition can not only push up prices, but also reduce innovation and business dynamics.

A second 2021 report argued that promoting competition, market entry and investment will encourage high-productivity firms to increase their production and obtain a larger share of resources (Ministry of Finance, 2021b). Regulatory policies and policies affecting business investment would need to be reviewed with this perspective in mind.

Germany

The 2019 report argued for a strengthening of European competition policy with a focus on standardised regulation and lower barriers to entry, noting that this would boost the benefits of the European single market (Sachverständigenrat, 2019). It also recommended not to promote or create national or European champions.

Ireland

The 2021 report explored insurance costs, legal costs, banking costs and social protection legislation and how these affect productivity and competitiveness (National Competitiveness and Productivity Council, 2021). The report noted that these are all areas where Irish firms are faced with exceptionally high costs compared with other countries. It made several recommendations, including further assessment of newly adopted personal injury guidelines; further exploration of ways to bring down legal costs; and an assessment of the introduction of fixed legal fees. It also recommended a review of banking in Ireland, noting the low levels of competition in the banking sector.

The 2022 report focused on the costs of energy, credit, insurance and legal services (National Competitiveness and Productivity Council, 2022). The report noted that these are longstanding issues and particularly important for SME's operating in the domestic market. It noted that enhancing domestic competition across the key services is essential to reduce input costs for enterprises and boost competitiveness and productivity. The report made several recommendations supporting ongoing actions, notably a review of retail banking and a review of the administration of civil justice. It also recommended actions to ensure that firms are made aware of the financing options available to them as government support

introduced during the COVID crisis is withdrawn. Moreover, it recommended that the government consider the implementation of a new government backed SME loan scheme.

Netherlands

The 2021 report explored some issues related to the growth of market power and concentration (CPB Netherlands Bureau of Economic Policy Analysis, 2021). It found no evidence that average mark-up rates in the Netherlands had grown over the past eleven years.

New Zealand

The 2021 inquiry into frontier firms pointed to the important role of innovation-enabling regulation for productivity (New Zealand Productivity Commission, 2021). It noted that regulation often does not keep pace with innovation, creating costly barriers to innovation and productivity. It pointed to several areas where regulation could be further improved, including in the dairy industry, consumer data rights, the regulation of genetic modification techniques, access to new plant varieties and breeding material, and district health boards. The inquiry provided several recommendations on innovation-friendly regulation, including to prioritise keeping regulations up to date with technological and other changes, notably in areas related to innovation. Moreover, where such changes require new or updated regulations, it recommended that their design and operation should allow for flexibility in achieving the desired regulatory outcomes, without compromising adequate monitoring and enforcement. The inquiry also provided recommendations on several specific regulatory issues, notably the next review of New Zealand's Dairy Industry Restructuring Act in 2024 or 2025; the introduction of a consumer data right consistent with Australia's sectoral-designation regime; a full review of the regulation of genetic modification; the design of new post-entry quarantine facilities for new plant varieties and breeding material; and the use of an intended major health system reform to improve the mandate, funding and incentives for New Zealand's District Health Boards.

Portugal

The 2019 report noted that, despite progress, Portuguese firms still face considerable administrative barriers to their functioning, including complex licensing systems and a slow judicial system (Conselho para a Produtividade, 2019). It also pointed to high costs of certain factor inputs, notably electricity. Moreover, it noted that despite significant progress in removing barriers to competition, some services continued to face high barriers to entry, including several professional services such as legal, accounting, architecture and engineering services. The report also noted that Portuguese firms still face strong financing constraints following the economic crisis, limiting capital accumulation. The small average size of firms, compared to other European countries, adds to this constraint, and limits their ability to achieve economies of scale.

United Kingdom

The first report of the UK Productivity Commission pointed to several dimensions of the business environment that were considered important for the UK's productivity performance (NIESR, 2022), notably the need for growth finance and investments in innovation, and more generally for a business environment that provides incentives for investment. Issues related to the regulatory environment and competition were briefly discussed. Apart from policies aimed at supporting innovation, the report called for reforms to the UK system of governance, which was considered too highly centralised and too much focused on the short term, e.g., in areas such as industrial policy. It recommended a more effective institutional framework based on expertise, central-local interaction and institutional memory.

5.3 Structural change and industrial policies

The structural dimension of productivity is also a well-known theme in productivity analysis and has been explored by several productivity commissions. Key themes include the role of structural change for aggregate productivity growth, notably the shift from manufacturing to services; as well as the relative contribution of manufacturing and services, or of ICT-producing and ICT-using industries to productivity. Building on such analysis, some countries have also explored the role of industrial policies.

Belgium

The 2022 report found that production sources are shifting towards the least dynamic activities in terms of productivity, although it pointed to a positive role of industry over the past decade, unlike in several other EU countries (National Productivity Board, 2022).

Denmark

The 2022 report explored the role of support policies in the context of COVID-19 and reflected on a report from a government working group on the use and design of such policies (De Økonomiske Råd, 2022). It agreed with the working group that support policies should only be used in situations with significant activity-limiting measures, not in case of ordinary economic downturns. However, it did not agree that general support schemes were preferable to more targeted schemes, arguing that general schemes have higher costs, tend to slow down structural adjustment, and could have a significant moral hazard problem in not encouraging adjustment by firms. It suggested that more targeted schemes should be the preferential way forward for future support packages. Moreover, it noted that Denmark had provided extensive liquidity to firms, including through changes in tax schemes and interest-free loans. It argued that such schemes are appropriate under exceptional circumstances, but that borrowing on market terms should now be the preferred option.

France

The 2019 report noted that the French production system may have certain features that hold back productivity growth (Conseil National de Productivité, 2019). For example, the gap between firms at the technological frontier and others is more pronounced in low-skilled

services sectors that are not exposed to international competition. Moreover, the productivity level of the most efficient firms in these sectors is lower than in the best performing countries, which is not the case in manufacturing and skilled services sectors.

The 2022 report found that intra-sectoral dynamics are the main source of productivity growth, and that employment is shifting to sectors with slightly higher productivity levels, but lower productivity growth (Conseil National de Productivité, 2022). This will tend to increase aggregate productivity levels in the short run, but lower productivity growth in the long term. The report also found that growth and divergence in labour productivity is mainly driven by the services sectors, due to their large weight, and that the decline in manufacturing employment since the early 2000s has contributed negatively to aggregate productivity growth. The report suggested that policies aimed at developing certain industrial activities, e.g., linked to green innovation, could help address the structural factor in productivity growth. It noted that France has had a slower development of high-growth sectors relative to leaders such as Sweden and the United States. It also suggested that policies should seek to reinforce productivity dynamics within growing sectors, which would need to be complemented by measures to facilitate worker mobility.

Germany

The 2019 report recommended not to promote or create national or European champions (Sachverständigenrat, 2019). The 2022 report noted that growing dependencies on supplies of energy and raw materials pose new challenges to Germany's economic model (Sachverständigenrat, 2022). It argued that these dependencies can be reduced by increasing European production capacities in strategically important areas, such as renewable energy and the domestic extraction of critical raw materials. It recommended to strengthen strategic autonomy, including by stockpiling of strategic raw materials, removing tax discrimination against such stockpiling, and supporting the EU concept of "open strategic autonomy".

United Kingdom

The first report of the UK Productivity Commission also devoted considerable attention to the sectoral dimensions of productivity performance (NIESR, 2022). Some of the evidence pointed to much of the UK's productivity problems being in just two sectors, finance and manufacturing. At the same time, the report noted that the industrial structure of the UK economy was not considered the main challenge, but rather performance within sectors. The report noted that industrial policy making in the UK had been affected by a short-term approach to policy making and argued for more effective institutional frameworks.

5.4 Regional dimensions of productivity

Several productivity commissions have looked at the regional dimensions of productivity, in exploring the contribution of different regions to aggregate productivity growth; the role of capital cities or dominant regions; and the diffusion of technology and knowledge across regions. Building on that analysis, they have also explored the role of regional or location-specific policies.

Australia

The 2017 5-year productivity review explored the role of cities in some detail (Productivity Commission, 2017a). The review noted the important role of cities in Australia, with 80 per cent of GDP produced in cities and 40 per cent in Sydney and Melbourne alone, as well as two-thirds of employment. The review explored what is required from cities from a productivity perspective and pointed to migration policies and land use and planning policies as important areas for policy consideration. It also focused on improvements in public infrastructure provision and use, notably roads, planning and land use policies, and conveyance duties on properties that affect labour market mobility. The review also explored the respective levels of policy responsibility in cities. It made recommendations on governance arrangements for public infrastructure; reforms to improve road prevision, including the establishment of road funds and road user charging pilots; the application of competition principles to land use policies; the implementation of best practice in development assessments; and the removal of stamp duties and the transition to a land tax.

Belgium

The 2022 report undertook a regional diagnostic of productivity (National Productivity Board, 2022). Compared to a reference group of European regions, labour productivity growth rates for Belgium's regions are around the average, with the Flemish region towards the higher end of the scale and the Walloon region towards the lower end. The diagnostic pointed to some sectoral differences, with the decline in productivity growth in Brussels and Flanders driven by all sectors, and notably market services, whereas the Walloon region had a positive contribution from manufacturing over the second decade of the 2000s.

Denmark

The 2021 productivity report explored several dimensions of the impact of cities on productivity (De Økonomiske Råd, 2021). One analysis found that wages change only slightly when workers move between different municipalities within a country, including from rural to urban areas, and that the direct productivity gains from workers moving between municipalities are limited. Another analysis found that graduates who remained in Copenhagen achieved a salary gain of approximately 10 percent five to ten years after graduation. The report noted that the gradual wage gains that are observed may be since more experience is gained in jobs in a big city, or that more job changes make it possible to find a better job match. A third analysis found that the price of renting commercial property is highest in the Copenhagen area, second highest in other large cities and lowest in rural municipalities. The report noted that businesses may be willing to pay a higher rent because

they are more productive in the big cities, e.g., due to gains from greater density. At the same time, the board noted that a high commercial rent indicates that there are particularly large gains for the business community from increasing the effective supply of properties in the cities.

The board also modelled the impact of certain policies, notably an increase in the supply of property, e.g., due to changes in regulations or the supply of new land; and a reduction in commuting costs, for example linked to better opportunities for working from home. This showed that increasing the supply of property in the City of Copenhagen would have positive effects on productivity and welfare, as more space would be available for businesses and because more jobs would be moved there. A similar increase in property supply across the country was estimated to influence productivity approximately 50 percent less. It noted that the model highlights the benefits of increased property supply, but not the costs. The model was also used to examine the impacts of increased work from home, focusing on the productivity effects that arise from lower commuting costs and found only limited effects, noting that there are many possible effects of working from home on productivity that were not included.

The report found that regulations, e.g., planning regulations, that reduce space for businesses have implications for productivity in large cities. On the other hand, it noted that these costs may be well justified due a range of positive externalities linked to such regulations. It also found that the use of commercial and non-commercial properties is distorted by a tax that is imposed by some municipalities on commercial use, aiming to finance business-related expenses (e.g., infrastructure) by the municipality. It argued that a better approach would be to impose a tax on the use of infrastructure directly and use broad-based taxes for the financing of public goods, such as roads.

France

The 2022 report noted that France is the EU country with the highest geographical concentration of productivity growth, with only one region (Île-de-France) having had productivity growth over 1% annually, compared with many more in other EU countries (Conseil National de Productivité, 2022). Excluding Île-de-France, the French regions are more homogeneous in terms of productivity levels and growth than those in other EU countries.

United Kingdom

The first report of the UK Productivity Commission devoted considerable attention to the regional dimensions of productivity performance (NIESR, 2022), noting the large gap in productivity performance between the Greater Southeast region (which includes London) and the rest of the country. It noted that the UK is the most inter-regionally unequal major high-income country among the OECD advanced economies. It pointed to a wide range of complex and diverse factors explaining this inequality, including the allocation of human capital and investment across the economy. It also pointed to agglomeration mechanisms as driving the differences between regions, and the role of infrastructure in affecting such mechanisms. Among the possible policy priorities, it included empowering local leadership in towns and local communities; improvements in housing choice, quality and supply to attract and retain

talent and support private investment; and efforts to tackle key structural problems affecting the levelling up agenda, notably overcentralisation; weak, ineffective institutions and high levels of policy churn; institutional and policy silos; and short-termism and poor policy coordination.

5.5 Energy, the green transition and productivity

In recent years, some productivity commissions have also started to explored issues linked to energy, environment, climate change and the green transition and their link to productivity.

Australia

The 2017 five-year review included a focus on the electricity market (Productivity Commission, 2017a). It noted that investment in electricity generation was being damaged by the absence of clarity over future emission reduction costs. It also noted that governance arrangements failed to give clear guidance and allowed pricing to be used against consumer interests. Moreover, it found that the existing system of renewable energy certificates allowed some generators to impose additional costs on consumers, arguing that these costs should be borne by generators. It explored reforms to energy markets and recommended cooperation across Australian governments. This included ending the stop-start approach to emissions reduction and the adoption of a proper vehicle that would put a single effective price on carbon; a better articulation of the acceptable trade-off between reliability and costs; more efficient pricing; clearer strategic direction for expert bodies and clearer accountability for outcomes; greater independence for market regulators and participants, combined with clear accountability for outcomes; and ensuring that short-term fixes are technologically neutral and support a sustainable long-term outcome.

The 2022 five-year review noted that climate change is likely to have large impacts on Australia's near-to-long term productivity performance (Productivity Commission, 2022a). It is expected to directly impact productivity in several sectors, e.g., agriculture, fisheries, tourism, and sectors relying on physical labour in outside environments. Apart from these direct physical impacts, it noted that policy efforts to contain the cost of climate change will entail costs and that policy actions across the world could affect demand for Australian exports. The review noted that least-cost mitigation and adaptation policies could help minimise climate-related risks for productivity growth (Productivity Commission, 2022a). It argued for broad-based explicit carbon pricing noting that Australia has thus far implemented many other policies that impose a wide range of carbon prices across the economy. It noted that a reform of Australia's Safeguard Mechanism – a system of tradeable emission rights – could help move towards a less costly and more equitable approach to emissions reductions. It also recommended greater coordination between levels of government. Finally, the review argued that Australia would also need to develop an efficient adaptation policy.

Belgium

The 2022 report noted that the impacts of the transition to a low-carbon economy on labour productivity were somewhat ambiguous, but that climate change itself is a serious threat to labour productivity (National Productivity Board, 2022). It pointed to the energy crisis as

another urgent reason to accelerate the transition to a low-carbon economy and noted the importance of price signals and innovation in making the transition. It also noted that short-term interventions should not create new lock-ins that could jeopardise the future.

Denmark

The 2022 productivity report explored government policies that aim at reducing greenhouse gas emissions by 70% by 2030 (De Økonomiske Råd, 2022). It noted that most of the policies are expected to be costly in economic terms, as they are based on subsidies and other measures, rather than a uniform greenhouse tax that had been advocated by the board. However, if the measures are effective, they could reduce the level of tax required in 2030. The report also noted that to achieve the necessary reductions in agriculture, the tax should also include methane and nitrous oxide emissions, not just CO2. It also commented on the report of an expert group on green tax reform, arguing that tax rates should be uniform, without reduction requirements and tax rates for individual industries.

Germany

The 2022 report noted Germany's growing dependencies on energy and critical raw materials and set out a range of policies to increase diversification and resilience and develop greater strategic autonomy in the European context (Sachverständigenrat, 2022).

Ireland

The 2020 Competitiveness Challenge report explored how to address climate action in the context of competitiveness (National Competitiveness Council, 2020). It explored how the business sector can decarbonise its activities in the most efficient manner, with the aim to remain competitive, while benefiting from possible opportunities linked to climate action. It considered several actions that can be taken in the short term, linked to existing policies such as carbon taxation; a levy charged to all electricity consumers to support the generation of electricity from sustainable, renewable and indigenous sources; and the EU emissions trading system. The report argued that firms should be liable for their carbon emissions, but also need to be supported to decarbonise their activities. The report argued for greater efforts to identify suitable abatement opportunities and technologies that would enable businesses to decarbonise their activities. It also recommended an assessment of available carbon mitigation incentives and supports to determine whether these were fit for purpose. Moreover, it argued for the establishment of a one-stop-shop environmental hub that would allow businesses to assess their carbon footprint and find information about available supports. It also recommended a clear policy signal to decarbonise Ireland's gas network, complemented by the development of a detailed pathway to achieve that goal.

The 2021 report noted that Ireland has had a relatively poor record to date in tackling greenhouse gas emissions, with other EU member states having been more successful in reducing emissions (National Competitiveness and Productivity Council, 2021). It noted that the current commitment to reduce emissions by 7% annually will be very challenging and require major efforts across sectors, where the report notes that two sectors, agriculture and transport, account for over half of all emissions. It argued for more research on the interaction

between competitiveness and policies to address climate change, with the aim to identify policies that can improve productivity and competitiveness while simultaneously achieving climate goals.

The 2022 report noted that well-designed environmental policies do not have large negative effects on the economy, but that the climate transition will generate winners and losers (National Competitiveness and Productivity Council, 2022). It noted that it is therefore vital that adequate supports are in place to assist enterprises and displaced workers adjust to the changes. The report also noted that Ireland's new climate action plan provides new opportunities for enterprises. It recommended ongoing monitoring and evaluation of government supports to ensure that adequate progress is being made and that targets remain appropriate compared with actions in other EU countries.

New Zealand

A 2018 review explored how New Zealand could meet its national goals and international commitments in achieving net-zero emissions by 2050 (New Zealand Productivity Commission, 2018a). The report noted that achieving this goal required efforts on two fronts, namely a fundamental reduction in high-emissions sources, and improving the emissions efficiency of production and consumption. It noted the importance of stable and credible policy settings. It recommended that the government make a strong and long-term commitment to the transition and provide transparency about policies to achieve this, supported by laws and institutions that underpin these policy settings. It recommended the use of emissions pricing to send the right signals for investment, innovation and mitigations. It also recommended to harness the full potential of innovation by making it a priority and devoting significantly more resources to low-emissions research, and to the deployment and adoption of low-emissions innovations. It further recommended to put other supportive regulations and policies in place, aimed at addressing non-price barriers and accelerating the transition. Finally, it recommended that government support investment in low-emissions technology, infrastructure and activities, through leadership and the mobilisation of new sources of finance.

5.6 Labour markets and migration

Besides the focus on human capital, productivity commissions have also looked at the link between labour markets and productivity, including the role of migration for productivity. The impacts of working from home have also become an important theme since the COVID-19 crisis.

Australia

The 2022 5-year review devoted one of its background reports to the labour market (Productivity Commission, 2022f). It noted that a well-functioning labour market is critical to productivity, notably by the matching of jobs to people with appropriate know-how and skills. It noted that barriers or disincentives to labour supply could affect productivity growth by affecting jobs and skills matching and limiting the pool of available skills. It also noted that the design of Australia's migration system and occupational licensing could act as barriers to

labour allocation towards its most productive uses. It also pointed to the role of labour markets in helping reduce the underutilisation of available skills.

The review also pointed to the relevance of Australia's workplace relation system to productivity, noting that employers and employees should – in principle - have strongly aligned interests in improving productivity to increase both profits and wages (Productivity Commission, 2022f). It argued that, as labour markets and the economy evolve, it will be important to ensure that regulations and institutional arrangements, as well as the workplace relation system, remain fit for purpose.

The review called for reforms to Australia's skilled migration system, away from restrictive skill shortage lists towards a system that better enables employer-sponsored skills migration. It noted that this will help Australia compete in global markets for skilled workers and help attract workers whose skills meet local demands. It also pointed to the need for better options for job mobility of sponsored migrants to improve matching skills to jobs. It also argued for improved recognition of qualifications and scope of practice, to promote the efficient utilisation of scarce skills, arguing for a more balanced approach to occupational licensing. It also recommended further simplification of Australia's award system – to set pay and working conditions – to improve the flexibility of employment conditions, better meet employer and employee needs, and reduce compliance costs and barriers in starting new businesses. It also argued for reforms to the enterprise bargaining system, which it considered unnecessarily complex and inefficient, and noted this could improve resource allocation and innovation. Finally, it noted that government should address the regulatory challenges associated with platform work.

Finland

A 2021 report argued that improvements in the mobility of the labour force, including the immigration of skilled workers, can promote better resource allocation and productivity (Ministry of Finance, 2021b). It noted that regulations affecting the labour market should be considered with this perspective in mind.

Germany

The 2019 report pointed to actions to leverage untapped labour market potential to increase the trend growth rate (Sachverständigenrat, 2019). This includes bringing more people into the labour market, notably women and older workers, reducing long-term unemployment, encouraging the immigration of skilled workers, reforms of the tax system to increase incentives for those not currently in employment, and a more flexible retirement age.

Ireland

The 2022 report explored several aspects of the labour market that might affect competitiveness and productivity (National Competitiveness and Productivity Council, 2022). It pointed to tighter labour market conditions that were leading to skill shortages. It explored several approaches to increase labour supply, including increased labour market participation, notably of women – where participation remains below levels in other countries

in northern Europe; older workers, linked to the need to extend working lives in the context of the ageing of Ireland's population; and workers with disabilities. The report also explored the role of net migration in enhancing labour supply and the role of permits.

The report recommended further measures to increase labour market participation among underrepresented groups, such as women, older workers and the disabled, and recommended further actions to bring "returnees" back into the labour market. Moreover, it recommended a comprehensive, independent evaluation of the impact of proposed measures to improving working conditions, comparing the situation with other EU countries.

New Zealand

The Productivity Commission focused on the role of immigration policy for productivity in several reports in 2022 (New Zealand Productivity Commission, 2022; Fabling, et al, 2022). It found that the relationship between productivity and immigration requires a balance of trade-offs, and a consideration of both short- and long-term impacts. While migrants may increase the productive capacity of the economy in the long run, this may take time to bear results and require complementary investments in infrastructure, and in training and workforce development. The report noted that immigration has played an important role in New Zealand's economic development, with the loss of skilled workers by outward migration being more than offset by the immigration of skilled workers from other countries and contributing positively to productivity. The report also noted that, on average, immigration is not driving down wages of replacing local workers. However, it noted that the immigration system currently uses a range of tools that may supress wages, job creation and productivity. Moreover, it found that the supply of infrastructure in New Zealand has not kept up with population growth.

The review recommended the publication of a policy statement to improve the quality and transparency of immigration policy. This would instil long-term thinking in this area of policy making and address the current reactive stance and sometimes conflicting priorities. It also recommended that government engage with the Māori community in good faith and reflect the existing partnership in immigration policy and institutions. It also recommended the development of stronger links between immigration policies and education and training policies and noted that immigration should not be restricted to prevent potential job displacement, but that rather the prospects of local workers should be improved.

Portugal

Portugal's national productivity board also examined aspects linked to the labour market that might affect productivity, including the link between productivity and wages (Mergulhão and Pereira, 2018). It found that two-third of Portuguese firms insufficiently raised wages given their growth in productivity. The paper noted that increased flexibility in the labour market increased segmentation and provided incentives for non-standard contracts. These factors, together with higher board compensation, trade and training weakened the link between productivity and wages. The 2019 report pointed to the need to assess the impact of labour market segmentation on productivity, noting that the Portuguese labour market has a very high level of segmentation, with groups of workers covered by very different levels of

employment protection (Conselho para a Produtividade, 2019). This segmentation is likely to affect mobility and incentives for training, and ultimately productivity.

United Kingdom

The first report of the UK Productivity Commission pointed to some issues related to the labour market that were considered relevant to productivity performance (NIESR, 2022). This included lack of labour mobility across the economy, in addition to challenges linked to the quality of human capital.

5.7 Other issues

Beyond the themes discussed above, that reflect the mainstream debate on productivity and its drivers, productivity commissions have occasionally explored some additional issues.

Australia

Australia's 2017 five-year review covered a wide range of issues beyond the typical focus of productivity-related analysis (Productivity Commission, 2017a). This resulted partly from the wider scope of the review, with a focus on living standards and prosperity, rather than productivity as such. This included the performance of the health sector, where the review noted that addressing health inequalities present large opportunities for the country to improve lifetime outcomes for people. This included better health outcomes and wellbeing, more voice and choice for patients, and greater efficiency. The review also noted that ill health directly affects social and economic participation with people in poor health less likely to be employed, tending to be less productive and working shorter hours. The review recommended better funding arrangements at the regional level; actions to reduce "low value" health interventions; actions to make the patient the centre of care; improvements in the use of data and information, including easy access to health care data for providers, researchers and consumers; and greater use of technology to change the current community pharmacy model. It also recommended changes to the system of alcohol taxation.

The 2017 review also explored the need for more effective governments in the context of productivity-enhancing reforms (Productivity Commission, 2017a). The report noted that effective government is a key area of policy reform, as these institutions set societal objectives; set standards that provide investor certainty and protect consumers and workers; and make public services effective including in setting service levels in areas such as health, education or the protection of the environment; provide funding for infrastructure; and collect and reallocate tax revenues to address inequities. It noted that the effectiveness of government is therefore critical for standards of living. The review explored a range of issues, including intergovernmental relations and national reform; the management of public finances; capabilities of government, and the role of local government. It recommended establishing a joint reform agenda across national and state governments; joint tax reform to support a more efficient provision of public services; improvements in fiscal strategy disciplines; the renewal of intergovernmental relations; greater focus on ensuring that accepted public services reforms are implemented; the strengthening of internal capabilities

within government to strengthen policy development and delivery; and greater support for local government performance, including through more meaningful performance reporting.

Belgium

Several productivity commissions have also explored measurement issues, focusing on trying to understand whether measurement issues in their country might affect measured productivity growth, and the understanding of productivity performance in their country. Belgium's 2020 report briefly discussed benchmark revisions in the national accounts introduced in 2019 that affected a range of industries, notably in the services sector and changed some productivity trends considerably (National Productivity Board, 2020). It also noted the difficulties in measuring output and productivity in certain non-market services, such as education and health, and called for more attention to such industries.

Denmark

Work by productivity boards on measurement has sometimes also involved the development of new indicators. For example, Denmark's 2019 NPB report included a new measure of productivity in the Danish primary and lower secondary school sector, based on the OECD's PISA tests (De Økonomiske Råd, 2019). This new measure was intended to help assess the amount of learning per student and is therefore able to capture certain quality changes. The work was part of a wider effort to develop better productivity measures for the public sector.

Ireland

The 2021 report explicitly recognised the importance of better evidence and research for productivity-related policies (National Competitiveness and Productivity Council, 2021). It recommended further robust and policy relevant research in the Irish context and noted that government should continue to monitor international research and evidence as regards changing work practices, including increased digitalisation, on productivity.

New Zealand

The Productivity Commission undertook a large study on how to improve productivity in the public sector in 2018 (New Zealand Productivity Commission, 2018b). It argued that state sector productivity is among the most important contributions government can make to national productivity and wellbeing, due to the benefits it provides to communities and individuals through better outcomes and services, and to the government through less pressure on public finances. For New Zealand, it found that there is resistance to the notion of productivity and efficiency in public services, and that New Zealand's state sector is intolerant of failure, which tends to stifle innovation. It pointed to systemic and cultural challenges in many agencies and noted that traditional approaches to commissioning limit customer input and the scope for innovation and productivity growth. It also pointed to several factors that hold back innovation, including overly prescriptive funding models, skewed incentives in the budget system, lacking use of data and evidence in designing policy and allocating resources, and inadequate monitoring, review and evaluation. It argued for

system-level changes for a more productive state sector, including well-designed quantitative productivity measures.

The review recommended redesign of processes for setting expectations and standards to identify opportunities for productivity gains in public services; the establishment of a community of practice to share knowledge, expertise and experience in productivity measurement; strengthening of capabilities to measure productivity in public services; collection and publishing of information on expenditure on core public services; the gradual and careful introduction of productivity measures in public sector performance management systems; greater use of data, analytics and modelling to design new initiatives and show benefits, including robust evaluation plans for new initiatives; the setting aside of a portion of operating budgets for high impact proposals for departments that can credibly demonstrate productivity gains; a review of funding models towards more results- and outcome-based systems; and changes to staff's performance frameworks aimed at improving cultures, values and staff engagement processes that support innovation and productivity in service delivery.

United Kingdom

The first report of the UK Productivity Commission devoted attention to some factors affecting productivity that are not always addressed by other commissions (NIESR, 2022). A first of those is governance, which not only concerns the respective roles of national and local governments for productivity, but also the high level of "policy churn" in the United Kingdom that limits policy effectiveness, notably in areas such as regional policy, digital and industrial strategies. A second factor is the role of health, and notably mental health, for productivity, with a large part of the population inactive due to ill health, affecting wages, jobs and productivity. The UK report also explored measurement issues related to productivity growth.

5.9 Summary and concluding remarks on indirect drivers of productivity

Compared with the relatively standard analysis of direct drivers of productivity discussed in section 4 of this paper, there is much greater variety in the work of the productivity boards on indirect drivers of productivity. Some themes, such as the business environment for productivity, including competition and regulation, and labour markets have been explored by several boards (Table 3). Others, such as structural factors and industrial policy, and the regional dimensions of productivity have thus far been explored by far fewer boards.

On trade and foreign direct investment (FDI), a few boards have examined the uncertainties linked to trade and GVCs following the COVID crisis and explored how to strengthen resilience (e.g., Australia, Belgium and Germany). Others have looked at the trade and FDI environment for their own country and how to enhance attractiveness (France and New Zealand). Some European countries highlighted the importance of European and multilateral approaches for international trade (Belgium, Germany). Germany's latest report focused on dependencies, GVC resilience and trade distortions.

Issues related to the business environment, e.g., competition, costs, finance and regulation, have been explored by most productivity commissions. Many have explored issues related to competition and business dynamism, including the analysis of industry concentration, mark-

ups and other indicators of market power (Australia, Denmark, Finland, Germany, Netherlands, Portugal). Ireland has had a strong focus on the high costs of doing business, while Portugal has explored issues related to financing of firms. Issues linked to regulation were also addressed by several commissions, e.g., Denmark, Finland, New Zealand and Portugal. Both Australia and New Zealand also explored issues related to consumer rights.

France was the only country that had a strong focus on structural features of the economy, i.e., manufacturing and services, in exploring productivity-related issues. Germany's latest report examined questions linked to strategic autonomy and production capabilities at the European level. On regional policies, both Australia and Denmark explored the role of cities for productivity, whereas France looked at the strong concentration of productivity growth in the country. Belgium also undertook a regional diagnostic of productivity growth.

Australia, Belgium, Denmark, Germany, Ireland and New Zealand are among the countries that have engaged in work on the relationship between climate change and environmental issues and productivity growth.

The link between labour markets and productivity has also been explored by several boards. This ranges from issues related to labour supply and participation (Australia, Germany and Ireland), migration (Australia, Denmark, Finland, Germany, Ireland and New Zealand), workplace relations (Australia), and labour market segmentation, flexibility and wages (Portugal).

Finally, several other issues have been explored by some boards. Australia and New Zealand have had an explicit focus on productivity in public services and the public sector, including its role for the broader productivity agenda, with Australia also focusing on health services and productivity. A few boards have also explored measurement issues related to productivity (Belgium, Denmark) or called attention to the importance of evidence and analysis for the development of productivity-related policies (Ireland).

The issues covered by the ten boards correspond quite well to the work of the UK Productivity Commission, although with some differences as regards the specific topics covered in the work (National Institute for Economic and Social Research, 2022; Table 3). It is important to note that the UK has only had one report thus far, while other boards have had several, with new issues emerging over time. Overall, there appears to be less emphasis in the UK on competition and regulation than in other countries, though the UK work has a stronger emphasis on regional issues and governance than the work abroad. On the policy side, the UK report did not include policies related to globalisation, notably trade, FDI, engagement in GVCs; energy and environmental policies; as well as labour market and migration policies amongst its current priorities.

Table 3: Key themes in the work by productivity boards on indirect drivers of productivity

	Trade, FDI, value chains	Business environment	Structural issues	Regional dimensions	Energy, green transition	Labour markets	Other issues
Australia	Trade in Services, FDI Screening, Tariffs	Concentration, Competition and Consumer Laws		Cities, Planning, Infrastructure, Governance, Tax	Carbon Pricing, Tradeable Permits, Impacts Productivity	Reform Migration, Mobility, Workplace Bargaining System	Health Sector; Effective Government
Belgium	GVCs, Growth Markets		Sectoral Shifts	Regional Diagnostic	Climate Change & Productivity, Energy		Measurement of Productivity
Denmark		Competition, Mark-ups, Regulation	Review Support Policies, Targeting	Cities, Planning Rules, Tax Policies	Carbon Taxes, Tax Reform, Other GHGs	Foreign Labour	Measurement of Productivity
Finland		Competition, Regulatory Policies				Mobility, Regulations, Immigration	
France	Attractiveness FDI, Location Factors, Tax Policies		Sectoral Shifts, Industrial Policies	Regional Concentration of Productivity			
Germany	GVC Resilience, Dependencies, Trade Distortions	European Competition Policy	Open Strategic Autonomy, EU Production		Renewable Energy and Critical Raw Materials	Labour Market Participation, Immigration	
Ireland		Cost Factors & Domestic Competition			Interaction Climate & Competitiveness, Support Policies	Labour Market Participation, Role of Returnees, Migration	Evidence for Productivity Analysis
Netherlands		Mark-ups					
New Zealand	Market Size, Distance, FDI Attractiveness	Innovation-Enabling Regulation, Data Rights			Emissions Pricing, Innovation and Regulatory Policies	Review Immigration Policies	Public sector productivity
Portugal		Regulation, Costs, Competition, Barriers to Entry				Labour Market Segmentation, Incentives Training	
United Kingdom	Trade, FDI, & Ownership, Export Demand		Structure & Sectors, Firm Size, Industrial Policies	Inter-Regional Gaps, Levelling Up, Governance		Reallocation & labour mobility	Governance, Health, Measurement

Source: Section 5 and reports from national productivity boards, see references for further detail.

6. Main findings and conclusions

This section summarises the main findings of the paper and draws some overall conclusions, including by linking the findings to the work of the UK Productivity Commission. It first reviews that key findings and policy implications of the work by productivity commissions thus far and then draws some implications for the work of the UK Productivity Commission.

6.1 Findings and policy advice

Although there is much variation across the various commissions as regards institutional arrangement, as discussed in section 2.1, there is much that their substantive work has in common. This is likely to reflect common challenges, such as the slowdown in productivity in many countries and the recent COVID-19 crisis; broader underlying trends affecting productivity such as digitalisation and structural change; as well as a shared understanding of the main drivers of productivity based on ongoing analytical work at the national and international level, including work based on new analytical tools. For example, many productivity commissions have started to move beyond aggregate and sectoral-level productivity in their analytical work to also examine the role of firm dynamics, the role of reallocation for productivity growth, and the productivity divergence between leaders and laggards.

Several commissions also draw on cross-country work at the international level, from both academic sources and national or international institutions. To understand better whether a factor identified in one country is country-specific – and can potentially be addressed by national policy action – or part of a broader global trend, international comparisons can be of great value, notably if such work also considers policy variables in the analysis. Moreover, international analysis, such as the OECD's work on productivity and business dynamics (Calvino, et al., 2020), can also enable and inspire national work, which may be able to go into more detail than international comparisons. Stronger cooperation between the various productivity boards to engage in such comparative work, either directly or in the context of the EU or OECD, could be very valuable.

While most boards have only limited resources for their analytical work, some interesting findings are emerging, e.g., research from France on the role of human capital in explaining the productivity slowdown, or from New Zealand on the role of frontier firms. Some central questions in the productivity debate have received relatively little attention in the work, however, notably the slowdown in aggregate investment and in technology diffusion.

Sections 4.6 and 5.9 of the paper already reviewed in some detail what the work of the boards has in common. Most boards have addressed all five of the direct drivers of productivity in their work, i.e., investment, human capital, innovation, digitalisation and entrepreneurship and business dynamics, although with differences in focus. The similarity in this aspect of their work is not surprising, as these drivers directly determine the contributions of fixed and intangible capital, human capital and multi-factor productivity to aggregate growth performance. Consequently, many boards also cover the main policy issues related to these drivers in their work. There are differences in the work on these five drivers as well, however. For example, some countries (e.g., Australia and Germany) have explored several specific issues linked to digitalisation, such as the role of data, whereas others have only engaged in a more general exploration. And while many countries have explored the role of laggards and

zombie firms for productivity, others, such as New Zealand have also explored the role of frontier firms.

There is much greater variation in the work of the boards on the indirect drivers of productivity. Some issues, such as trade and FDI policies; business, competition and regulation policies; and labour market policies have been addressed by several boards, while far fewer have thus far looked at industrial and regional policies, for example. Differences in (perceived) mandates may play a role here, for example in the extent to which commissions are expected to examine the regional dimensions of productivity or only national ones. Institutional arrangements at the national level may play a role too, e.g., the role of productivity commissions relative to other national authorities, e.g., competition commissions or monetary and financial markets authorities. Moreover, most productivity commissions from EU countries have only explored some dimensions of trade and foreign direct investment, presumably since the main responsibility for trade policies rests with the European Union, not with national governments.

New issues are also emerging in the work of the boards. Following the emergence of the COVID-19 crisis in 2020, many boards have undertaken work to examine the impact of COVID-19 on productivity through channels such as telework and firm dynamics, and some (e.g., Belgium, Denmark, France and Germany) have also played a role in exploring COVID support schemes or recovery packages.

Many of the policy recommendations emerging from the boards reflect the results of long-standing work on productivity and structural reform. However, new policy questions linked to productivity, such as the rationale for a more focused or targeted innovation policy (New Zealand); increased strategic autonomy (Germany); or policies linked to data and artificial intelligence (Australia, Germany, Ireland) are now starting to be tackled by some boards. This suggests that several commissions do not take a narrow view of their mandate and are willing and able to tackle a wide variety of factors and policies that may affect productivity.

Despite the many similarities, it is not always clear how the boards set their agenda. In some, like Finland, France, and Portugal, the first reports produced in 2019 or 2020 established a sound underpinning for further analysis and subsequent reports deepened the analysis and policy reflections. But political considerations also matter for agenda setting as boards are asked to respond to emerging policy issues, such as the COVID-19 crisis. Moreover, the composition of the boards – academic, government or multi-stakeholder – may play a role.

Apart from reviewing what the productivity commissions have addressed in their work, it is also interesting to look at areas that have thus far not received much attention in their work or have only been explored by a few boards. Without being exhaustive, some areas can be highlighted:

- *The impacts of climate change on productivity*, and more generally measures of environmental or resource productivity. The bulk of the work by productivity commissions thus far has focused on exploring the productivity of labour and capital and their joint (multi-factor) productivity. Productivity commissions have not yet looked much at the growing importance of resource productivity, the relationship between productivity and climate change or measures of productivity adjusted for environmental impact (Cárdenas Rodríguez, et al., 2018). Some boards, such as Belgium, Germany and Ireland, have started to reflect on the implications of climate change for productivity and competitiveness, however.

- *The role of intermediate inputs for productivity*. Apart from some work in France's 2022 productivity report (Conseil National de Productivité, 2022), few productivity commissions have taken a so-called KLEMS perspective on productivity, accounting not only for capital (K) and labour (L), but also for the role of intermediate inputs, i.e., energy (E), materials (M) and services (S). Given growing concerns about supply chains, security and resilience related to resources and the availability of intermediate inputs, more work on this topic might emerge in the future, as shown in Germany's latest report (Sächverstandigenrat, 2022).
- *Wages, inequality, wellbeing and productivity*. Most productivity commissions have focused on the contribution of productivity to growth and competitiveness and have not looked much yet at how the benefits of productivity are diffused to workers and across the economy through wages, and how this affects inequality in the economy (see e.g., Berlingieri, et al., 2017b). Moreover, only a few have started to go beyond GDP in considering wellbeing or broader indicators of economic and social performance. Austria's recently established national productivity board appears to be moving in this direction.
- *Productivity of the public sector and its impact on aggregate productivity*. While this topic has been addressed in Australia and New Zealand, and is also raised by the UK, productivity commissions in the EU have not yet focused much of their work on this issue.

6.2 Implications for the UK Productivity Commission

The work by the UK Productivity Commission differs in several ways from the work of the ten productivity boards discussed in this paper. As noted already, the UK Productivity Commission is essentially a group of independent experts, mainly from academia and policy research institutions, who strive to develop ideas for a pro-productivity policy agenda. The Commission draws on a wide range of expertise (from its own Commissioners, invited experts, incl. some (ex-)policy makers, and researchers from third parties and The Productivity Institute). It also engages in discussions with policy makers to determine policy opportunities and solutions. The Productivity Commission is supported by a secretariat at the National Institute of Economic and Social Research and draws on funding provided by The Productivity Institute.[10]

The working methods of the UK Productivity Commission differ as well from those of other boards. They have thus far mainly involved formal hearings with experts on specific topics, complemented by a limited amount of supportive research by the NIESR secretariat, The Productivity Institute and commission members. This is different from the approach followed by most productivity commissions that have an (often small) dedicated secretariat that engages in focused empirical and policy analysis for the national productivity reports, typically complemented by discussions among commission members about analytical findings, priorities and policy recommendations. In the case of Australia and New Zealand, amongst others, productivity-related inquiries also involve extensive public consultation on the draft findings and policy conclusions.

The previous sections already briefly discussed some of the links between the work of the various productivity commissions and the first report by the UK Productivity Commission (National Institute for Economic and Social Research, 2022). Clearly, and as shown in Tables 2

[10] See https://www.niesr.ac.uk/partner/productivity-commission for details about the work of the UK Productivity Commission, including details on the members of the Commission.

and 3, there are many commonalities in the work, notably on issues such as investment, skills and the business environment. Some differences can be observed as well, however:

- Thus far, there has been relatively limited attention to issues related to digitalisation in the work of the UK Productivity Commission compared to the work of the ten productivity commissions, almost all of whom have explored several dimensions of this topic in their recent work.
- Moreover, although there has been from some discussion on resource allocation and productivity convergence, issues related to business dynamism and competition have not yet received much attention in the work of the UK Productivity Commission. This topic has grown in importance in the work of most productivity commissions in recent years, including in the context of the COVID-19 crisis.
- As regards the indirect drivers of productivity, while trade and exporting are discussed in the UK report, the policy issues related to trade, foreign direct investment and global value chains were not considered among the policy priorities for the work of the UK Productivity Commission in the coming years (NIESR, 2022).
- Other issues that have not yet received much attention in the work of the UK Productivity Commission (but neither in several other boards) are energy and environmental policies, and social and labour market policies.

As noted previously in this paper, these differences may partly reflect the relatively short history of the UK work compared to that in other countries, where additional issues have also emerged over time.

Interestingly, there are also several areas where the UK Productivity Commission has already touched on issues that are yet not much reflected in the work abroad. This is notably the case with the strong focus on regions and "levelling up" in the UK work, with only a few other boards undertaking some location-specific work in recent years (Australia, Belgium, Denmark and France).

Related to this, the UK interest in governance and institutions is also not much reflected in the work of the various foreign productivity boards, possibly as it is considered outside the formal mandate of the work of most productivity boards.

Moreover, except for a focus on management, organisational factors such as ownership have not been a large theme in the work of the foreign productivity commissions thus far, which may reflect a view that policy makers may not have many tools at their disposal to influence certain within-firm processes.

The inclusion of these issues in the UK work suggests that the UK Productivity Commission has a broader and more open mandate than the commissions abroad, with greater freedom to engage in areas it wishes to contribute to.

Comparing the work of other productivity commissions compared to that in the UK is not intended to provide a list of themes that should necessarily be explored in the work of the UK Productivity Commission or TPI. National contexts and priorities differ and what may be important in one country is not necessarily central to discussions in another. Rather, the comparison with work in other countries is intended to provide context and ideas for reflection in the future work of the UK Productivity Commission.

The first report of the UK Productivity Commission already included several issues as its main priorities for further analysis and policy reflection (National Institute for Economic and Social Research, 2022), notably business support and governance; investment; levelling up; and skills, management and training. In addition to these issues, and considering what other commissions are currently focused on, four other issues may need further consideration in the future:

- First, given the shock to UK growth and productivity performance in the past years as the result of Brexit, greater attention may need to be devoted in the future to exploring the impacts of trade links, attractiveness to FDI, migration, and engagement in GVCs on UK productivity. This is also an area where there could be a difference with most European productivity commissions, where trade policies are typically considered out of scope for national policy and for the work of productivity commissions.
- Second, following the recent shock to energy systems due to Russia's invasion of the Ukraine and the growing importance of policies to address climate change, exploring the links between energy and climate-related policies and productivity should be of growing importance also for the UK context. Any work on this topic could include a focus on the so-called twin transition of the energy/environmental and digital transition, which would be well aligned with the work of The Productivity Institute. The latest productivity report from Germany could provide useful inspiration.
- Third, issues related to the relationship between productivity, inequality and wellbeing could be important for the UK context and would be well aligned with the discussion on levelling up.
- Finally, many productivity commissions are currently exploring areas where policy could help boost productivity by more active or targeted policies related to innovation, industry, entrepreneurship and the digital economy. This could potentially also be an area of work that could receive more attention in the future work of the UK Productivity Commission.

Policies for productivity are not only complex, but also wide-ranging, which means there remains a lot of work ahead for all commissions to further disentangle the drivers of productivity and the policy levers that can be used to strengthen productivity growth and diffuse its benefits across the economy and society. The current experimentation by more than 20 commissions across the OECD – in a variety of institutional arrangements – with analysis and policy advice on productivity is a new and important source of policy learning that should be drawn on in full by academic research and policy analysis. Cooperation between the commissions in various international settings and engagement with the academic community and stakeholders can play an important role.

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