The Rise of Pro-Productivity Institutions: A Review of Recent Developments

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Abstract

This article reviews the recent analytical work and policy recommendations of eleven national productivity commissions, i.e. Australia, Belgium, Denmark, Finland, France, Germany, Ireland, the Netherlands, New Zealand, Portugal, and the United Kingdom. It finds several differences between the commissions as regards institutional set-up, composition, and degree of independence, amongst others. The commissions have much more in common in their analytical and policy work. This likely reflects common challenges, such as the slowdown in productivity and the COVID-19 crisis, as well as structural trends such as digitalization. It also reflects a shared understanding of the main drivers of productivity, notably investment, human capital, innovation, digitalization and creative destruction, and the policies affecting those drivers. The article also finds some areas that have not yet received much attention from commissions, such as the link between the environment and productivity or the relationship between productivity, wages, and inequality. 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.

The central role of productivity for economic performance has been recognised for many years. But it is only recently that many governments have decided to establish new institutions focused on providing policy advice related to the pur-

1 Research Fellow, The Productivity Institute (TPI) and Associate Researcher, Valencia Institute of Economic Research (IVIE). This article provides an overview of a large body of work by eleven productivity commissions. Out of necessity, this has required a selection among the work undertaken with only that considered most important covered in the article. In most cases, the review covers the annual productivity reports of European commissions between 2019 and 2022. For Australia and New Zealand, where no annual productivity 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 early draft are highly appreciated, as are comments received from Andrew Sharpe, three anonymous referees, members of several national productivity commissions, and at seminars at The Productivity Institute, the Austrian Productivity Board, Arena Idé and the OECD. Any errors of substance or interpretation are mine. A longer version of the article with more detail is available in Pilat (2023). Email: dirk.pilat@manchester.ac.uk

2 For clarity, this article will use the term productivity commission to describe these institutions, although several of the institutions use the term productivity board or council.

suit of productivity growth, in the form of productivity commissions or boards.[2] Australia's Productivity Commission is the oldest of these pro-productivity institutions, officially created in 1998. From 2010 onwards, several other countries also established commissions, initially New Zealand (2010), Denmark (2012), Mexico (2013), Norway (2014) and Chile (2015).[3] Following a recommendation of the EU Council in September 2016, many EU countries have also established productivity commissions. Today, some 20 productivity commissions operate across the OECD and EU area.[4] Not all EU countries have established a commission, however. Among Eurozone countries, Austria only established a commission in 2022, while Estonia, Italy and Spain have not yet done so. Among non-Eurozone countries, only Denmark, Hungary and Sweden (as of April 2023) have thus far established a productivity commission.

While the work of most commissions started only recently, the work that is emerging points to many drivers and policies that are considered to affect productivity. This article reviews what the commissions have thus far explored in their work, on both the drivers of productivity and the policies that can strengthen it. It focuses on eleven countries that may provide helpful insights for the global debate on productivity, i.e. Australia, Belgium, Denmark, Finland, France, Germany, Ireland, the Netherlands, New Zealand, Portugal, and the United Kingdom (UK).

The article is organized as follows. The first section briefly frames the policy debate on productivity and the role of productivity commissions. Section 2 reviews what the various productivity commissions highlight as the main direct drivers of productivity and explores the policy issues related to those drivers. Section 3 discusses several indirect drivers and their policy implications. Section 4 summarizes and draws some conclusions.

The Role of Productivity Commissions

Broadly speaking, productivity commissions have been set up to highlight the importance of productivity for economic performance, to explore the drivers of productivity and to provide guidance to governments on policies that can strengthen productivity.[5] 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

3 Of these five productivity commissions, those in Denmark (2012-2014), Mexico, and Norway (2014-2015) were short-lived. A new productivity commission was established in Denmark in 2019.

4 See Cavassini *et al.*(2022) and https://economy-finance.ec.europa.eu/economic-and-fiscal-governance/national-productivity-boards_en

5 Productivity-related institutions were also set up in a number of 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.

counter one-sided political pressure against reform and help educate the community about what is at stake."

In practice, productivity commissions play a variety of roles, such as promoting understanding about productivity in the national policy debate; developing new evidence and analysis on productivity growth and its drivers; providing policy recommendations to government or other actors (e.g. stakeholders and parliaments); contributing to policy discussions, e.g. the COVID-19 crisis; or engaging in international discussions on productivity, e.g. at the EU or OECD level.

Their institutional set-up differs across countries, however, affecting the role they play. Recent OECD work (OECD, 2022; Cavassini*et al.* 2022) considers three elements in the work of productivity commissions, notably: a) their institutional set-up, including their resources and analytical independence; b) responsibilities and functions of the commission, including its expertise and analytical capacity; and c) outreach, including engagement with stakeholders, dissemination and influence on policy making. Moreover, the effectiveness of commissions does not only depend on these internal factors, but also on governments' commitment to support the commission, and its capacity to review and implement policy recommendations (OECD, 2022; Cavassini *et al.* 2022).

The eleven productivity commissions covered in this article differ considerably across countries (Table 1). Some commissions, like Australia and New Zealand, are well established and have a long history of work on productivity, although they both have a broader mission with productivity only part of their mandate. Both undertake relatively long and deep government-mandated productivity-related inquiries. However, Australia's five-year productivity reviews (Productivity Commission, 2017a; 2022a) or New Zealand's review of frontier firms (New Zealand Productivity Commission, 2021) are by some margin the most comprehensive reports covered in this article.

In EU countries, productivity commissions were established following the 2016 recommendation by the European Council. This set out several requirements, including an open-ended mandate; functional autonomy to prevent undue influence from government; procedures to nominate members based on experience and competence; adequate access to information; and capacity to communicate in public (European Commission (EC), 2022). These requirements are expected to be underpinned by national provisions. For example, the functional autonomy of the commissions is, in most cases, set out in domestic legislation (EC, 2022).

The recommendation includes a certain amount of flexibility, however including the type of institutional design (EC, 2022). In some EU countries, commissions were created building on long-standing economic or competitiveness councils that were given additional mandates, as in Denmark, Germany, and Ireland. In yet other EU countries, such as Belgium and France, the commissions were 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 commissions were closely linked to existing

Table 1: Overview of the Productivity Commissions Reviewed

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 organizations
Danish Economic Council	2017	Independent advisory body (multi-stakeholder)	To analyze 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	Analyze 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	Analyze developments in the field of productivity and competitiveness	Independent, provides advice to German policymakers
Ireland National Competitiveness and Productivity Council	2018	Independent council established by government (multi-stakeholder)	Analyze 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 factors driving productivity growth	Independent agency, part of Ministry of Economic Affairs and Climate Policy
New Zealand Productivity Commission	2011	Standing inquiry body	Improved well-being, improved productivity	Independent, reports to Parliament
Portugal Productivity Council	2018	Joint temporary structure	Monitoring policies in the field of productivity and support discussion on the subject	Joint economic structure of Ministry of Finance and Ministry of Economy
UK Productivity Commission	2021	Independent body, established by NIESR and The Productivity Institute	Understand economic research related to productivity, provide policy advice, and develop policy recommendations	Body operating independently of government, working closely with policy makers

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 and Cavassini, et al, (2022).

government institutions and mainly provided analytical work.[6]

The UK Productivity Commission is the only commission of the eleven covered here that is not established by government and consequently works more independently from government. 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 while engaging 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.

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. Consequently, the commissions have varying degrees of independence and links to government ministries and agencies, which may affect the nature of their work, and the advice provided. Moreover, the official reporting of the various commissions differs. Australia's and New Zealand's commissions also report to parliament, whereas most others only report to government. An interesting exception is Belgium's commission, that also reports to a council of trade unions and employer organizations.

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, although they may be supported by government officials, as in France. 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 analysis and policy advice that is emerging. For example, Ireland's analysis of specific business costs (see Section 4) may be related to the role that business plays in the commission.

The growing role of productivity commissions reflects the importance that many countries attach to productivity, and concerns about the sharp slowdown in productivity over the past decades. An extensive literature has emerged about explanations for the slowdown and the limited impact (thus far) of new technologies.[7] Several productivity commissions have undertaken their own work to identify factors that could be addressed through (national) policy action. Some of the commissions have also attempted to distinguish between structural and global factors affecting productivity and national factors. Structural and global factors might not easily be amenable by national policy action, e.g. the global slowdown in technological progress or the shift from manufacturing to services, while national factors, e.g. skills shortages, could potentially be addressed by national policies.

6 A useful overview of the work of EU commissions was recently prepared by the European Commission (EC, 2022). That article also provides further detail on the institutional arrangements of the EU national productivity commissions. Detail on several commissions in the OECD area is available in Cavassini *et al.* (2022).

7 See Goldin *et al.* (forthcoming) for a recent review of the literature.

Productivity is a complex phenomenon, driven by many factors and policies. To facilitate the discussion, this article 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, digitalization, and entrepreneurship. Pro-productivity policies in this area aim to influence these drivers, e.g. through investment policies, education and skills policies, innovation and digital policies, or policies related to entrepreneurship and business dynamics. Thus far, the bulk of the work of the 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 as emerging from labour market pressures or resource and environmental constraints. Productivity commissions have explored a diverse range of issues in this area.

The Direct Drivers of Productivity

This section reviews what productivity commissions highlight as the direct drivers of productivity in their country and covers five drivers, i.e. investment in tangible and intangible capital; skills and human capital; R&D and innovation; digitalization; and entrepreneurship and business dynamics. It also explores the policy issues linked to those drivers.

Investment in Tangible and Intangible Capital [8]

Investment and capital formation are typically considered among the most important drivers of (labour) productivity and can also have spillover effects on multifactor productivity. Several productivity commissions have explored the slowdown in business investment in their country, including the role of macroeconomic policy. They have also examined the role of public investment, notably in infrastructure, that is often considered to have a catalytic effect on private investment and productivity.[9]

A first issue addressed by several boards is the overall decline in business investment, which is regarded as one of the main factors explaining the slowdown in productivity growth. Australia found that borrowing costs, availability of capital and profitability levels did not affect invest-

8 Intangible investment includes innovative property, computerised information, and economic competencies (Corrado *et al.* 2005). This section only discusses analysis and policy recommendations linked to aggregate investment in intangibles. The discussion linked to specific categories of intangible investment is covered in the sections on human capital and skills, innovation and R&D, and digitalization, respectively.

9 The role of foreign direct investment is explored in section 4

ment, but that the opportunity cost of capital, perceptions of risk, and market power enjoyed by firms were important (Productivity Commission, 2022a). Structural factors were considered to play a relatively limited role, although the shift from manufacturing to services might have increased the share of intangible investment. It underscored the need for deeper productivity-enhancing reforms to improve expected risk-adjusted returns.

Belgium noted that sound public finances were important, but that these should provide room for efficient public investment (National Productivity Board, 2020). It also noted the need to improve the efficiency of public spending, engage in public-private partnerships, and remain attractive to foreign direct investment.

Germany pointed to lagging investment in ICT and in complementary intangible assets such as software, data, and R&D (Sachverständigenrat, 2019). It noted the importance of a reliable business environment and a competitive tax system and suggested that fiscal policy should provide space for investment in public infrastructure and growth-promoting spending. It also called for a tax allowance for corporate equity, to help balance the privileged tax treatment for borrowed capital.

The Netherlands found that investments in intangible capital rose sharply as a share of GDP since the 1990s (CPB Netherlands Bureau for Economic Policy Analysis, 2021).

New Zealand found that its firms are typically capital-shallow (New Zealand Productivity Commission, 2021). It attributed this to the high cost of capital goods, a history of high long-term interest rates, and rapid population growth. Low returns to investment, low wages and access to low-cost immigrant labour also contributed.

Portugal found that changes in debt levels and labour market regulation had had a positive effect on aggregate investment, while uncertainty, financial constraints and the level of interest rates had a negative effect (Conselho para a Produtividade, 2021). It also found that firms still face strong financing constraints following the economic crisis, partly reflecting the small average size of firms in Portugal (Conselho para a Produtividade, 2019).

The United Kingdom noted that low levels of investment had contributed to the UK's poor productivity performance (NIESR, 2022), linking this to lack of growth finance; the overall business environment; economic uncertainty, e.g. linked to Brexit and the COVID crisis; and a labour market that may have favoured firms' increasing employment rather than engaging in new investments. It recommended a long-term infrastructure plan to catalyze private investment; reductions in the cost of capital driven by tax breaks; improvements in the tax environment; and faster growth in UK exports from new trade deals.

Despite its importance for aggregate investment, macroeconomic policy has not been a big topic for productivity commissions. Belgium noted the importance of growth and productivity for tax revenues, which in turn would allow for government spending in different areas and widen the range of political choices for government (National Productivity Board, 2019). Finland pointed to the influence of demand

and the business cycle on productivity, including changes in capacity utilization as well as demand shocks (Ministry of Finance, 2020).

Several commissions have examined the role of public investment, noting its importance for productivity and the agglomeration of activities (NIESR, 2022) and the possible catalytic effect it could have on private investment (National Productivity Board, 2020). Denmark pointed to the importance of cost-benefit analysis and noted that policy should consider all impacts of public investment (De Økonomiske Råd, 2020).

Ireland noted that austerity following the 2008 economic crisis had led to considerable infrastructure deficits (National Competitiveness Council, 2020). It recommended more spending, but also actions to improve the quality of spending (National Competitiveness and Productivity Council, 2022). It pointed to growing labour market pressures that affected the capacity to deliver on investments. It recommended more support for public bodies in evaluating, planning, and managing public investments; and suggested that regions and cities learn from best practice to maximize the efficiency of public spending. It also recommended a long-term perspective on infrastructure spending, and improvements in the planning code and the resourcing of planning authorities (National Competitiveness and Productivity Council, 2022).

Ireland also explored investment in housing, noting that affordable housing is important for competitiveness as it indirectly affects enterprises' costs, influences quality of life and the competitiveness of goods and services, and could affect the attractiveness of Ireland as a location for investment (National Competitiveness and Productivity Council, 2021).

Human Capital and Skills

Together with capital formation, human capital is typically considered among the most important drivers of productivity, not only through its direct contribution to productivity growth, but also because it is highly complementary to investment in fixed and intangible assets and to innovation and digitalization. For example, a French modelling study found that about half of the long-term slowdown in productivity growth in the country can be explained by a slowdown in the growth of human capital, noting the close links between human capital and other within-firm factors such as management, innovation, and digital technologies (Conseil National de Productivité, 2022). The slowdown was explained by slower growth of education levels as more young people completed upper secondary and tertiary education. It concluded that increasing the quality of education will now be the main lever for productivity growth. France's situation is typical of many advanced economies, with little scope for further expansion in educational achievement, and a growing focus on the quality of education, skills development and the allocation of skills across the economy.

Productivity commissions have explored a wide range of specific policy issues related to human capital, such as the role of education, including STEM education; skills formation and skills mismatch; the role of management; and the contribution

of migration to productivity. Education systems and initial education levels are a first policy issue explored by productivity commissions. For secondary education, Australia recommended more diffusion of best teaching practices; better use of digital technologies and teacher's time; and greater scope for innovation (Productivity Commission, 2022a; Productivity Commission, 2022b). For tertiary education, it recommended improving incentives for providers to deliver courses adapted to changing skills needs and rebalancing funding to reflect these changing needs. It also recommended improvements in teaching quality; better adapted use of technology; continuous improvement; and actions to reduce non-completion rates. France noted that its schooling system is less successful in reducing socioeconomic inequalities than other countries (Conseil National de Productivité, 2021). Germany pointed to the need to improve equality of opportunity, noting that there is a strong correlation between children's education level and that of their parents (Sachverständigenrat, 2019). It pointed to the importance of early childhood education and greater flexibility in educational pathways. Portugal noted the great disparity in qualifications of the workforce as a factor limiting productivity growth (Conselho para a Produtividade, 2019).

Skills and life-long learning are a second key theme. Australia found that one in five Australians still have low basic skills, limiting opportunities (Productivity Commission, 2022a; 2022b). It noted that an adaptable skills system can be resilient to changing skills needs. Belgium argued for a comprehensive approach to life-long learning (National Productivity Board, 2020) and noted that the shortage of STEM, and in particular ICT-related skills, had an adverse effect on productivity (National Productivity Board, 2022).

France pointed to the mediocre level of skills compared with other European countries (Conseil National de Productivité, 2021) and noted that, until recently, there had been 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. It argued for a well-functioning and agile lifelong learning system, that can help meet demand for emerging skills. It also pointed to growing demand for highly cognitive skills and non-cognitive skills such as autonomy, management, and communication (Conseil National de Productivité, 2022). It recommended greater recognition of the role of soft skills in the transformation of the economy.

Ireland noted that it is doing well on ICT specialist skills and those with above basic digital skills but lags for those with basic digital skills (National Competitiveness and Productivity Council, 2021). It made recommendations related to the development of skills related to artificial intelligence (AI) and skills for the zero-carbon economy, and the delivery of a modern apprenticeship system (National Competitiveness and Productivity Council, 2022). The UK pointed to several challenges, including skills gaps; lack of high-quality training and participation in such training; gender gaps, e.g. in STEM skills; limited agility of the skills system; lack of incentives for upskilling and reskilling; and lack of good management practices

(NIESR, 2022). It also pointed to declining labour mobility between regions, which contributed to a growing skills mismatch between supply and demand.

Related to the question of skills is skills mismatch, which affects productivity by reducing within-firm productivity and affecting the efficiency of skills allocation across firms (McGowan and Andrews, 2015). Belgium found that the existing mismatch in skills risked becoming even wider because low-skilled people were hit the hardest by the COVID crisis (National Productivity Board, 2020). Moreover, it noted that the acceleration of digitalization due to the crisis was further changing skills needs. France also identified a significant mismatch between workers' skills and those required for their job (Conseil National de Productivité, 2019). Ireland pointed to key skills gaps and possible mismatch in the labour market (National Competitiveness and Productivity Council, 2022). Portugal pointed to skills mismatch as a labour market distortion of importance (Conselho para a Produtividade, 2021). It noted that the rise of telework following the COVID crisis could improve the mobility of work, expand access to talent and increase competition, but might benefit higher skilled workers most, thus potentially increasing inequality.

A relatively new issue that has gained attention in recent years is management skills, which play an important productivity enhancing role through their impact on organizational and work practices and the allocation of workforce skills within a firm (Criscuolo *et al.* 2021). Finland noted that the average quality of management in Finland is good but that the quality of management practices varies across the country (Ministry of Finance, 2020). France noted that its firms are less efficient in the human dimensions of management relative to their management strengths in production (Conseil National de Productivité, 2022).

Germany found it was doing relatively well in international rankings and noted that management skills were important for its "hidden champions", fast-growing SMEs with high market shares in specialized markets, and for firms adopting ICT (Sachverständigenrat, 2019). Ireland pointed to the challenge of management in the context of remote working, noting that managers, in particular those working in SMEs, often had not received adequate training to deal with new challenges, such as blended working arrangements of office and telework (National Competitiveness and Productivity Council, 2021). New Zealand found that many firms lack leadership skills (New Zealand Productivity Commission, 2021). It recommended a systematic approach to building and retaining talent. It also recommended the evaluation of existing programmes for building firm-level management and leadership skills. Portugal found that its schooling of managers is below the EU average, especially in small firms, affecting its adaptability to technological change and competition (Conselho para a Produtividade, 2019).

Several countries have explored the link between migration, skills, and productivity. Denmark noted that inflows of foreign labour can increase productivity by providing access to new knowledge, improving skills use, and encouraging reallocation (De Økonomiske Råd, 2022). Australia called for reforms to its skilled migration system,

moving from restrictive shortage lists towards a system that would better enable employer-sponsored skills migration (Productivity Commission, 2022c). This would help it compete in global markets and help attract workers whose skills meet local demands. Denmark pointed to the need for better options for job mobility of sponsored migrants to improve matching skills to jobs. It explored policies proposed by the government to attract foreign labour and address labour shortages, including reduced thresholds for pay of foreign workers, an expanded list of persons eligible, and greater access to fast-track procedures (De Økonomiske Råd, 2022).

New Zealand noted that despite large inflows of immigrants over the past 10 years, it faces skills shortages, suggesting a skills mismatch between the supply of labour and business needs (New Zealand Productivity Commission, 2021). It recommended a government review of migration policy to assess its role and objectives. It also recommended working with industry to reduce reliance on seasonal migrant labour, and more empirical studies and evidence building to support policy making related to migration. It also argued that the relationship between productivity and immigration requires a balance of trade-offs (New Zealand Productivity Commission, 2022; Fabling *et al.* 2022). 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. It recommended to improve the quality and transparency of immigration policy, instil long-term thinking in policy making and address the conflicting priorities.

Innovation, Research and Development

Innovation and technological progress are the third key driver of productivity in most economic theories of growth and in 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 technology and knowledge diffusion; and new forms of innovation policy.

Support policies for private R&D were examined by several countries. Belgium found that investment in R&D had increased since 2005, but that this was mainly due to a small number of large firms in a few industries (National Productivity Board, 2021). It attributed the increase in spending partly to partial tax exemptions on wages for R&D staff but noted that efficiency gains could be achieved by better aligning direct and indirect support (National Productivity Board, 2022). Denmark evaluated a proposed increase in the tax deduction for R&D and noted that more analysis would be needed (De Økonomiske Råd, 2019).

Finland found that R&D spending had been remarkably weak since 2009, mainly due to a strong decline in business spending, resulting from the collapse of the electronics industry, notably Nokia (Ministry of Finance, 2021a). It noted that direct public support through grants for cooperation may be more effective than R&D tax incentives (Ministry of Finance, 2021b). It also noted that a lack of high-productivity firms in Finland requires more attention to innovation, notably for more radical

innovation projects (Ministry of Finance, 2021b).

France identified 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 private investment in R&D, and low efficiency of expenditure on R&D in France, including a lack of interaction between public and private research.

Germany found that business spending on innovation in is highly concentrated among large firms (Sachverständigenrat, 2020). It 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). It recommended to improve incentives for SMEs to invest in innovation; expand the European Research Area; improve the diffusion of knowledge and technology; improve access to public sector data; better embed innovation criteria in public procurement; and increase the availability of private venture capital.

Ireland pointed to a decline in R&D intensity since 2012 (National Competitiveness and Productivity Council, 2021). It explored the release of a new research and innovation strategy and the establishment of an innovation funding agency (National Competitiveness and Productivity Council, 2022). New Zealand recommended that the government review the operation of the country's R&D tax incentive, identify and implement possible amendments; and consider supplementing the scheme with the use of grants (New Zealand Productivity Commission, 2021). Portugal noted that while investment in R&D has grown, much of this is concentrated in the public sector, with an insufficiently strong link to business (Conselho para a Produtividade, 2019). It found that the impacts of its system of R&D tax credits were strong and persistent and found no evidence of crowding out (Conselho para a Produtividade, 2021).

Australia focused on diffusion of knowledge across the economy rather than 'new-to-the-world' innovation (Productivity Commission, 2022d). It recommended policies to link Australian firms to foreign firms through trade and foreign direct investment; skills and migration policies, with a focus on transferable skills; and policies to improve information flows to firms. It also pointed to the importance of knowledge diffusion in non-market services but noted that innovation in these services is often slow, piecemeal, disorganized, and inconsistent across jurisdictions. Belgium noted that the transition to a knowledge-based economy has increased the barriers to diffusion and called attention to policies that can strengthen diffusion (National Productivity Board, 2022). It also called for more exploration of the topic. The UK pointed to knowledge hubs, collaboration, and open innovation for innovation performance (NIESR, 2022). It also pointed to a lack of technology diffusion from leaders to laggards, a lack of collaboration between business and universities, and a lack of absorptive capacity in many firms.

An in-depth exploration of innovation policy was undertaken by New Zealand. It noted how it is lagging other small advanced economies and argued that past at-

tempts at focused innovation policy have lacked scale, resources, and durability to be effective (New Zealand Productivity Commission, 2021). Moreover, it noted that previous efforts have been based on government-driven processes, and not on design and governance involving multiple stakeholders. It recommended to build innovation capacities and linkages in the innovation system, review existing programmes, and develop a more focused innovation policy aimed at high potential areas to complement broader innovation policies. It recommended that government partner with stakeholders on a small number of areas to focus its efforts, conditional on matching resources from the private sector.

Digitalization

Issues related to the contribution of digitalization to productivity are an important theme in the work of several productivity commissions. This work has addressed the uptake and diffusion of digital technologies, but also relatively new topics in the productivity literature, such as the role of data as an asset and the potential contribution of telework to productivity.

Data is an intangible asset and considered to be of growing importance to firm performance, including in enabling big data analytics and artificial intelligence. Australia recommended to establish consumer rights over consumer's own data; the removal of barriers to the use of public data; adoption of a copyright law with fair use exceptions; and removal of the competition law exemption for intellectual property (Productivity Commission, 2017b). Germany found that the COVID-19 crisis had boosted demand for data-driven services (Sachverständigenrat, 2021). It pointed to several barriers to the development of a data economy, including a shortage of staff to develop digital innovations, and security concerns linked to the storage of sensitive information. It called for greater data access and sharing; more competition in the platform economy; stronger consumer protection; consideration of technological sovereignty; and more coordination linked to cyber security.

The uptake and use of advanced digital technologies for productivity was explored by many boards. Australia recognized the potential of these technologies to improve productivity (Productivity Commission, 2022e). It pointed to several barriers affecting the uptake of digital technologies, notably inadequate access to the Internet due 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 considered a barrier for medium and large firms. It recommended new infrastructure funding arrangements to provide reliable Internet solutions for remote areas; further actions to meet skills needs, including skilled migration policies; and better coordination of digital-related policies to reduce overlap and uncertainty.

Belgium noted that it was important to take advantage of the momentum of the COVID-19 crisis to accelerate the digital transition by encouraging investment in these technologies and the necessary complementary investment in skills (such as digital and management skills), organizational innovation and management capacities, fast, secure and reliable broadband,

a new digital culture, further progress on e-government, and regulation aligned with the digital economy (National Productivity Board, 2020). France noted that its lag in ICT adoption might help explain the slowdown in productivity in France (Conseil National de Productivité, 2019). It noted that this might be linked to management and organizational practices, rigidities in the labour market, and regulatory barriers in the product market. Germany noted that its delayed adoption of ICT and low levels of investment might explain the low productivity impacts of ICT in Germany thus far. It recommended greater investment in digital infrastructure, by addressing barriers such as long approval procedures; more teaching of digital skills and improvements in lifelong learning; and reforms to competition rules (Sachverständigenrat, 2019). Ireland pointed to a relatively low use of advanced digital technologies by business and argued for more certainty on the roll-out of the National Broadband Plan (National Competitiveness and Productivity Council, 2022).

The impact of remote working or telework on productivity was also explored by some commissions. France found that firms that increased telework in 2019 were on average more productive and had also been more resilient during the crisis. It concluded that teleworking is likely to have a varied impact on the attractiveness of jobs, working conditions, and the split between full and part-time work, with uncertain impacts on aggregate productivity (Conseil National de Productivité, 2022). Ireland noted that it might take time before the impacts of telework on productivity become apparent (National Competitiveness and Productivity Council, 2021). To help maximize the gains of teleworking for productivity, while minimizing the risks for workers, it recommended improvements in digital infrastructure, and in digital and managerial skills; new legislation on the right to request telework, as well as simpler rules to claim expenses linked to working from home. The UK also noted the potential for increased productivity from working from home (NIESR, 2022).

Entrepreneurship, Business Dynamics and Resource Allocation

While entrepreneurship and business dynamics have long been considered important drivers of productivity, work on this topic has only recently become part of the analytical toolbox of productivity commissions, thanks to greater access and availability of microdata. Key issues that have been considered are the contribution of entry, exit and firm growth to productivity; productivity convergence and divergence, and the contribution of resource allocation to aggregate productivity growth; and business dynamics following the COVID-19 crisis.

Entry, exit and firm growth are the first set of issues that have been explored by productivity commissions. Belgium pointed to a low rate of resource allocation, low rates of new firm creation, and the lowest rate of firm exit among EU countries as factors affecting productivity (National Productivity Board, 2019). It also found that many innovative start-ups struggle to reach a sufficient scale (National Productivity Board, 2021). Policy-wise, it noted the importance of favourable conditions for

young innovative start-ups, including in helping them scale. It also recommended to remove exit barriers for unviable businesses (National Productivity Board, 2021).

Finland noted that lack of competition and business dynamics is not the cause of poor productivity growth in Finland (Ministry of Finance, 2022). It noted also that access to funding does not seem to be the main problem for SMEs and business dynamics (Ministry of Finance, 2021a), but that lack of skilled personnel and competent management are important factors. Moreover, while general funding was not a constraint, access to funding for R&D by young innovative firms was considered a factor. It pointed to several policies that can strengthen creative destruction, including innovation policies; competition policies to support the reallocation of resources; education and training policies to improve knowledge creation; and housing, regional and labour market policies to facilitate labour mobility (Ministry of Finance, 2020).

Germany found that slow population growth may be among the factors explaining its low start-up rate (Sachverständigenrat, 2019). It also pointed to growing market concentration. It pointed to regulation in the labour market and market access barriers in services sectors as areas where improvements might be possible. The Netherlands found that the churn of firms – the sum of entry and exit – had declined, mainly due to a declining entry rate from 2006 onwards (CPB Netherlands Bureau for Economic Policy Analysis, 2021). It also noted that the entry of new firms contributed positively to productivity growth in services, but that incumbents drove productivity growth in manufacturing.

On productivity divergence and resource allocation, Belgium found a growing divergence in productivity growth between leaders and laggards (National Productivity Board, 2019). It also found that the country did have several global productivity leaders. Finland found a high diversity of productivity among firms and found that it lacks high-productivity firms (Ministry of Finance, 2021b). It also noted that resource allocation is poor, with the most productive firms operating on too small a scale. Moreover, it found that resource allocation has worsened, with labour moving away from the most productive firms to the less productive ones. It also noted that firms had invested more in capital than could be expected and hired less workers than expected, noting that misallocation was a significant factor lowering productivity (Ministry of Finance, 2022). France found that the overall slowdown in productivity is more pronounced for firms at the frontier (Conseil National de Productivité, 2022). This could point to a slowdown in the overall rate of technological progress and affect the scope for technology diffusion (OECD, 2015). It also noted that the renewal of firms at the frontier has slowed down, which may point to reduced competitive pressures. The Netherlands found no evidence of productivity divergence between frontier and lagging firms (CPB Netherlands Bureau for Economic Policy Analysis, 2021). The UK noted that the UK's productivity problem is concentrated among the leading firms, rather than the laggards (NIESR, 2022). On resource allocation, it noted it was doing well

compared to other OECD countries, with most resources going to the most productive firms.

While several commissions discussed the role of frontier firms for productivity, policies related to frontier firms were the focus of work in New Zealand, which found that productivity levels in frontier firms were considerably below those in other small advanced economies (New Zealand Productivity Commission, 2021). It also found that the gap between frontier and non-frontier firms did not change significantly between 2003 and 2016, in contrast with many European countries. This could indicate that technology diffusion has been relatively effective but could also reflect the relatively low productivity levels of frontier firms and low growth rates, making it easier for non-frontier firms to keep up. It noted that non-frontier firms in European countries benefited from productivity growth in frontier firms in other countries, unlike in New Zealand. This likely reflects its distant location, which acts as a barrier to the diffusion of tacit and non-codified technologies.

A third issue addressed by several commissions is business dynamics following the COVID-19 crisis. Denmark noted that the economic support packages that the government had introduced to address the COVID crisis risked entrenching the prevailing business structure by protecting unprofitable businesses that might have exited the market in the absence of COVID (De Økonomiske Råd, 2021) For future economic crisis situations, it recommended using more targeted schemes rather than general support schemes, as general schemes might weaken structural adjustment (De Økonomiske Råd, 2022). France pointed to a significant drop in bankruptcies as emergency measures ensured the survival of many firms (Conseil National de Productivité, 2021). It pointed to two key risks; a) bankruptcies of productive firms once these measures are lifted with possible knock-on effects; b) overprotection of unviable, "zombie" firms with possible impacts on resource reallocation. It called for better information to help target support, prepare the unwinding of emergency measures, and identify necessary debt reductions.

Germany found that the number of job losses and business closures during the COVID-19 crisis was lower than in previous recessions (Sachverständigenrat, 2021). It attributed this to support measures for firms, a short-term working scheme, and the suspension of the obligation to file for insolvency. It recommended to improve the efficiency of allocation mechanisms following the crisis by a range of reforms. Portugal noted the 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. It also pointed to the experience of previous international crises as regards the emergence of so-called "zombie" firms (Conselho para a Produtividade, 2021).

Only a few commissions have paid specific attention to the productivity issues related to SMEs. Ireland pointed to opportunities for closer links between the multinational enterprise sector and do-

mestic SMEs, for example through trade links, labour mobility, innovation cooperation and closer links with research institutions (National Competitiveness and Productivity Council, 2021).

Summary on Direct Drivers of Productivity

With a few gaps and some differences in emphasis, the eleven productivity commissions reviewed in this article have generally all analysed the role of investment, human capital, R&D and innovation, digital transformation, and entrepreneurship and business dynamics for productivity (Table 2). Drawing on that work, they have also explored a wide range of policy issues over the period covered by this review. Some of the issues reflect common challenges linked to international developments, e.g. the slowdown in productivity growth, or rapid digitalization spurred by the COVID crisis. Others reflect national contexts and specific domestic challenges. Many common elements can also be observed in the policy responses advocated by the commissions. A few points stand out in the work thus far:

- Considering its importance, productivity commissions have devoted relatively little attention to policies to address the slowdown in aggregate investment, possibly since they consider it a structural factor, not easily influenced by national policy. Moreover, only a few commissions have explored the role of macroeconomic policies and financial markets for investment. This may be linked to the mandate of commissions and institutional arrangements within countries. Only a few commissions have explored the broad policy settings related to intangible investment, e.g. linked to its financing, although many have examined specific areas of intangible investment, such as skills, R&D and data.
- Human capital and skills are the most widely explored drivers of productivity, including new issues such as management. Research by France's commission suggests that the role of human capital for productivity growth is much larger than suggested by growth accounting, possibly linked to the strong complementarities with investment. Several commissions point to lack of skills and skills mismatch as constraints on productivity growth.
- Innovation and technology are also explored by many commissions, with relatively standard policy advice emerging related to business support policies, innovation systems and advanced technology use. There has been relatively little attention thus far to new or emerging issues, such as the role of data and artificial intelligence for productivity, or, except for New Zealand, the role of more targeted (or mission-oriented) innovation policies. Most surprisingly given its prominence in the debate on productivity, only a few commissions, notably Australia and Belgium, have explored policies linked to technology diffusion.
- Although a relatively new issue, most commissions have explored several dimensions of business dynamics and

Table 2: Key Themes in the Work by Productivity Commissions on Direct Drivers of Productivity

	Investment	Human Capital and Skills	R&D and Innovation	Digitalization	Entrepreneurship & Business Dynamics
Australia	Macro Drivers of Business Investment, Structural Factors, Social Benefits	Foundational and Specific Skills, Lifelong Learning, School Productivity	New to the World Innovation versus Diffusion, Non-Market Services	Uptake Advanced Technologies Data Economy, Non-Market Property, Infrastucture	
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	Digitalization 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	Domestic 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	Digitalization 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 3 and reports of national productivity commissions. See Pilat (2023) and references for further detail.

acknowledge its importance for productivity. The link between business dynamics, competition and productivity has not yet been much explored. Except for New Zealand, most commissions have paid more attention to policies related to laggards than to policies that might boost productivity in frontier firms.

Indirect Drivers of Productivity

This section provides a brief overview of work on several key indirect drivers of productivity, i.e. trade and foreign direct investment; the business environment, competition, and regulation; structural features and industrial policy; regions and productivity; the role of energy and environmental factors; and the role of labour markets. As noted above, these drivers and the related policies affect productivity indirectly, by influencing the functioning of product, labour and financial markets and the resulting allocation of resources; by providing access to international markets, and by affecting firms' incentives to improve productivity.

Trade, FDI and Global Value Chains

Trade and foreign direct investment (FDI) are important drivers of productivity linked to foreign competition, specialization, technology diffusion, and economies of scale, amongst others.

Trade policy issues have not been discussed much by EU commissions, likely reflecting the EU's role in policy making in this area. Belgium and Germany advocated actions to strengthen Europe's position in global value chains, increase coordination at the European level and strengthen multilateralism (National Productivity Board, 2020; Sachverständigenrat, 2019). Germany's latest report recommended to reduce dependencies and increase resilience of global value chains by greater diversification (Sachverständigenrat, 2022). While it considered this mainly a responsibility for the private sector, it noted that government could provide targeted support for diversification, help develop strategic alliances and partnerships, and provide loan and investment guarantees. Australia argued for the removal of remaining tariffs to reduce costs for importing firms and advocated policies to draw greater benefits from trade in services (Productivity Commission, 2022a). The UK noted the constrained demand for UK exports (NIESR, 2022), pointing to the high costs of exports, with Brexit having increased the frictional costs of trade and supply side gaps.

On FDI, Australia argued for adjustments to its screening regime, in ensuring that these appropriately account for security concerns, but avoid disincentivizing investment (Productivity Commission, 2022a). France found that high labour costs, production and corporate taxes have held back the location of production sites, while the R&D tax credit system had a positive effect (Conseil National de Productivité, 2022). It suggested continuing to develop its tax system so that it weighs less on the factors of production than in other countries. New Zealand recommended a more proactive approach to attracting FDI by incorporating FDI policies within a focused innovation policy and by upgrading

its innovation system (New Zealand Productivity Commission, 2021).

Business Environment, Competition and Regulation

The business environment is important for productivity with empirical research showing that sound competition is a positive factor for productivity growth, whereas too much or inappropriate regulation can hold back productivity growth.

Several commissions explored issues related to competition. Australia pointed to an increase in overall concentration in the economy; a decline in firm entry and exit; as well as an increase in mark-ups (Productivity Commission, 2022a). It noted that competition laws need to remain fit for purpose (Productivity Commission, 2022a; 2022f).

Denmark found that markups increased from 5 per cent above costs in 2000 to 18 percent in 2018, suggesting that competition had become weaker (De Økonomiske Råd, 2022). It found that firms increased their productivity and market share when they were given more opportunities to import semi-finished products or goods for resale. It also suggested that increased demand for exports may have increased firms' productivity and mark-ups, e.g. due to knowledge spillovers associated with trade. It found no evidence that firms benefiting most from new technologies had increased their market power, e.g. in benefiting from economies of scale in software development, or that regulation had become more anti-competitive.

Finland suggested that less effective competition policies may have contributed to a weakening of business dynamics (Ministry of Finance, 2021a). Germany argued for a strengthening of European competition policy with a focus on standardized regulation and lower barriers to entry (Sachverständigenrat, 2019). It also recommended not to promote or create national or European champions. Ireland explored high business costs in several services sectors and noted that enhancing domestic competition is essential to reduce costs and boost productivity (National Competitiveness and Productivity Council, 2021; 2022). The Netherlands found no evidence that average mark-ups had grown (CPB Netherlands Bureau of Economic Policy Analysis, 2021).

On regulations, New Zealand noted that these often do not keep pace with innovation, creating costly barriers to innovation and productivity (New Zealand Productivity Commission, 2021). It recommended prioritizing keeping regulations up to date with technological and other changes, notably in areas related to innovation, and that the design and operation of regulations should allow for flexibility in achieving the desired regulatory outcomes. Portugal noted that firms still face high administrative barriers, including complex licensing systems and slow judicial system (Conselho para a Produtividade, 2019). Moreover, despite progress, some professional services continued to face high barriers to entry, such as legal, accounting, architecture, and engineering services.

Structural Features and Industrial Policies

The structural dimension of productivity

is a well-known theme in productivity analysis that has been explored by several productivity commissions, including the impact of the shift from manufacturing to services on productivity, and the role of industrial policies.

Several countries addressed issues related to their economic structure. Belgium found that production sources are shifting towards the least dynamic activities in terms of productivity (National Productivity Board, 2022). France noted that intra-sectoral dynamics are the main source of productivity, and that employment is shifting to sectors with higher productivity levels, but lower productivity growth (Conseil National de Productivité, 2022). The UK found that its productivity problems were mainly located in finance and manufacturing, although it noted that industrial structure was not the main challenge, but rather performance within sectors (NIESR, 2022).

Industrial policies were another focus. France suggested that policies to foster new activities, e.g. green innovation, could help develop high-growth sectors (Conseil National de Productivité, 2022). Germany noted that growing dependencies on supplies of energy and raw materials pose new challenges to its economic model (Sachverständigenrat, 2022). It recommended to increase European production capacities in strategically important areas, such as renewable energy and the domestic extraction of critical raw materials. It also recommended to strengthen strategic autonomy, including by stockpiling of strategic raw materials, and by supporting the EU concept of "open strategic autonomy". The UK noted that industrial policy had been affected by a short-term approach and argued for more effective institutional frameworks (NIESR, 2022).

Regional Dimensions of Productivity

Several productivity commissions have explored the regional dimensions of productivity, e.g. the role of cities and the contribution of different regions to aggregate productivity. Both Australia and Denmark focused on the role of cities. Australia noted that 80 per cent of its GDP is produced in cities and that Australia's eight capital cities represent over two-thirds of total employment. It made recommendations to strengthen the role of cities for productivity, e.g. governance arrangements for public infrastructure; reforms to improve road provision; 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 (Productivity Commission, 2017a). Denmark also explored the impact of cities on productivity (De Økonomiske Råd, 2021), including the role of planning regulations and municipal taxes. It found that planning regulations that reduce space for businesses have implications for productivity in large cities and that the use of property is distorted by municipal taxes for infrastructure.

Some countries have explored the role of regions for productivity. Belgium undertook a regional diagnostic of productivity (National Productivity Board, 2022). France noted that it is the EU country with the highest concentration of productivity, with only one region (Île-de-France) having had productivity growth over 1 per cent an-

nually (Conseil National de Productivité, 2022). The UK found that it is the most inter-regionally unequal major high-income country in the OECD (NIESR, 2022). 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, and outlined several possible policy priorities.

Energy, Green Transition, and Productivity

In recent years, some productivity commissions have also started exploring issues linked to energy, environment, climate change and the green transition and their link to productivity. Australia noted that climate change will have large impacts on productivity and that policies to contain climate change will entail costs. It recommended least-cost mitigation and adaptation policies to minimise risks (Productivity Commission, 2022a).

Belgium 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 productivity (National Productivity Board, 2022). It pointed to the energy crisis as another urgent reason to accelerate the transition and noted the importance of price signals and innovation.

Denmark explored policies to reduce greenhouse gas emissions by 70 per cenr by 2030 (De Økonomiske Råd, 2022). It noted that most of the policies are expected to be costly, as they are based on subsidies and other measures, rather than a uniform greenhouse tax. Germany noted its dependencies on energy and critical raw materials and set out policies to increase diversification and develop greater strategic autonomy (Sachverständigenrat, 2022). Ireland 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.

New Zealand argued for a strong and long-term commitment to the transition and transparency about policies (New Zealand Productivity Commission, 2018a). It recommended the use of emissions pricing to send the right signals for investment, innovation, and mitigation. It also recommended to devote more resources to low-emissions research, and to the deployment of low-emissions innovations, combined with other supportive regulations and policies.

Labour Markets and Productivity

Besides human capital, several commissions have explored the link between labour markets and productivity, including labour force participation and mobility and labour market regulation.[10] Australia noted that a well-functioning labour market is critical to productivity by matching jobs to people with appropriate skills (Productivity Com-

10 Issues related to migration policies, skills and productivity were already addressed in section 2.

mission, 2022c).

A first issue addressed by several commissions is labour force participation, even though this has uncertain impacts on productivity. Germany 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, reform of the tax system to increase incentives for those not currently in employment, and a more flexible retirement age. Ireland pointed to tighter labour market conditions that were leading to skill shortages and made several recommendations to increase labour market participation among underrepresented groups, such as women, older workers and the disabled, as well as further actions to bring "returnees" back into the labour market (National Competitiveness and Productivity Council, 2022).

Australia and Portugal both looked at industrial relations and labour market regulation. Australia pointed to the relevance of its 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, 2022c). It recommended further simplification of its award system to improve the flexibility of employment conditions, better meet employer and employee needs, and reduce compliance costs in starting new businesses (Productivity Commission, 2022c). It also argued for reforms to the enterprise bargaining system, which it considered unnecessarily complex, noting this could improve resource allocation and innovation. Portugal noted 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 is likely to affect mobility and incentives for training, and ultimately wages and productivity.

Labour market mobility is another theme addressed by some commissions. Finland argued that improvements in the mobility of the labour force, including the immigration of skilled employees, can promote better resource allocation (Ministry of Finance, 2021b). It noted that regulations affecting the labour market should be considered with this perspective in mind. The UK pointed to lack of labour mobility as a factor affecting productivity (NIESR, 2022).

Governance, Health and Productivity Measurement

Beyond the themes discussed above, that reflect mainstream issues in the debate on productivity and its drivers, productivity commissions have explored some additional issues, including the role of government, health and measurement.

Australia noted the need for more effective governments in the context of productivity-enhancing reforms and made extensive recommendations (Productivity Commission, 2017a). New Zealand argued that state sector productivity is a key contribution from government to overall productivity and well-being (New Zealand Productivity Commission, 2018b). The UK explored the role of governance, noting

this not only concerns the respective roles of national and local governments, but also the level of "policy churn" (NIESR, 2022).

Australia also explored the performance of the health sector, noting that people in poor health are less likely to be employed, tend to be less productive and work shorter hours. The UK also stressed the role of health, notably mental health, for productivity (NIESR, 2022).

Several productivity commissions explored measurement issues linked to productivity. Belgium discussed benchmark revisions in the national accounts (National Productivity Board, 2020). Denmark included new measures of productivity in the primary and lower secondary school sector (De Økonomiske Råd, 2019). Ireland recognised the importance of better evidence for productivity-related policies and recommended further research (National Competitiveness and Productivity Council, 2021). The UK also discussed measurement issues (NIESR, 2022).

Summary on Indirect Drivers of Productivity

The overview of work on indirect drivers shows that productivity commissions are tackling a wide range of issues in their work. Compared with the analysis of direct drivers of productivity discussed in the second section, there is greater variety in the work of the productivity commissions on indirect drivers, however. Some themes, such as trade and investment and the business environment, including competition and regulation have been explored by several commissions (Table 3). Others, such as structural factors and industrial policy, and the regional dimensions of productivity have been explored by far fewer.

Differences in mandates and institutional arrangements at the national level may affect this variety, for example the extent to which commissions are expected to examine the regional dimensions of productivity or only national drivers and policies, or the role of productivity commissions relative to other national authorities, e.g. competition commissions. Recent work by some commissions on complex and emerging issues such as climate change, value chain resilience and strategic dependencies 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 that may affect productivity.

Main Findings and Conclusions

The rapid rise in the number of productivity commissions across the OECD area – from five in 2014 to 21 today – is helping to put productivity (back) on the policy agenda and is adding to the global evidence base on productivity and pro-productivity policies. While there is considerable variation in institutional arrangements, composition and focus on analysis or policy advice, the commissions broadly appear to pursue a common agenda. This likely reflects similarities in mandates (Table 1); common challenges, such as the global slowdown in productivity and the recent COVID-19 crisis; broader underlying trends affecting productivity such as digitalization and structural change; as well as a shared understanding of the main drivers of productivity.

Most of the analytical work undertaken

Table 3: Key Themes in the Work by Productivity Commissions 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 and 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 4 and reports from national productivity commissions, see Pilat (2023) and references for further detail.

by the productivity commissions follows relatively standard methodologies, such as trend and industry analysis, growth accounting and economic modelling (Pilat, 2023). However, most commissions have now moved beyond aggregate and sectoral-level data to micro data and are also examining the role of firm dynamics and reallocation, and the productivity divergence between leaders and laggards. Stronger cooperation between the productivity commissions in this analytical work, e.g. in the context of the EU or the OECD, or in bilateral or multilateral arrangements, would be valuable.

While most commissions have only limited resources for research, 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 analytical work, however, such as the slowdown in aggregate investment or in technology diffusion.

Most commissions address all five of the direct drivers of productivity in their work, i.e. investment, human capital, innovation, digitalization, and business dynamics, although with differences in their precise focus. The similarities in this aspect of their work are not surprising, as these five drivers largely determine the contributions of fixed and intangible capital, human capital, and multifactor productivity to aggregate growth performance. Consequently, many commissions also cover the main policy issues related to these drivers in their work. There are interesting differences in the work on these drivers as well, however. For example, some countries (e.g. Germany) have explored several specific issues linked to digitalization, such as the role of data, whereas others have only engaged in a general exploration of the topic. And while many countries have explored policies related to lagging firms, others, such as New Zealand have also explored the role of frontier firms for productivity.

There is much greater variation in the work of the commissions on the indirect drivers of productivity and the related policy issues. While some issues, such as trade and FDI policies; business, competition, and regulation policies; and labour market policies have been addressed by several commissions, far fewer have explored industrial and regional policies, for example. Differences in (perceived) mandates may play a role here, for example the extent to which commissions are expected to examine the regional dimensions of productivity or only national drivers and policies. 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, presumably since the main responsibility for trade policies rests with the European Union, not with national EU governments.

Some commissions also respond to national crisis situations as part of their work. Following the start of the COVID-19 crisis, many commissions have undertaken work to examine its impact 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 examining COVID support schemes or recovery packages.

Many of the policy recommendations emerging from the commissions reflect the results of long-standing work on productivity and structural reform. At the same time, and as shown by Tables 2 and 3, there is considerable variety in the analysis and policy advice of the commissions, suggesting that national policies for productivity are not "one-size-fits-all".

New policy questions linked to productivity, such as the rationale for a more focused or targeted innovation policy (New Zealand); resilience and strategic dependencies (Germany); or policies linked to data and artificial intelligence (Australia, Germany, Ireland) are now starting to be tackled by some commissions. This shows that many commissions have gone considerably beyond the "Washington consensus" (Williamson, 2004), and do see a clear role for government in strengthening productivity.

The wide range of issues covered also suggests that many commissions do not take a narrow view of their mandate and are willing and able to tackle a wide variety of factors that may affect productivity. In taking on such a wide range of issues, questions of policy coordination across different parts of government emerge, however. Except for the UK, this is not an issue that has been addressed in much detail by productivity commissions in their productivity reports.

While the commissions have already tackled many issues, there are also several important issues that have not yet received much attention in their work, notably:

- *The impacts of climate change on productivity*, and more generally the link between productivity and sustainability. The bulk of the work thus far has focused on exploring the productivity of labour and capital and their joint (multifactor) productivity rather than on other relevant productivity measures, such as resource productivity, or measures of productivity adjusted for environmental impact (Rodríguez *et al.* 2018). Some commissions, such as Belgium and Ireland, have started to reflect on these issues in their latest reports. Given the large impact that climate change is likely to have on productivity, this is an important gap in the work of several productivity commissions.
- *The role of intermediate inputs for productivity.* Apart from some work by France in their latest report (Conseil National de Productivité, 2022), few 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). Growing concerns about supply chains and the availability of intermediate inputs (energy and critical raw materials in particular) is starting to lead to some work on this topic, notably in Germany's latest report (Sachverständigenrat, 2022), which explored the country's dependencies on energy and raw materials.
- *Wages, inequality, well-being, and productivity.* Most productivity commissions have focused on the con-

tribution of productivity to growth and have not yet examined how the benefits of productivity are diffused to workers and across the economy, and how productivity growth relates to inequality and inclusive growth (see e.g. Berlingieri *et al.* 2017; OECD, 2021). Only a few commissions, such as New Zealand and Chile have gone beyond GDP in considering well-being or broader indicators of economic and social performance. Some of the recently established commissions, such as Austria, are starting to go beyond GDP in their work, however. As with climate change, this is an important gap in the work of several commissions, given the growing focus on well-being and more inclusive growth in the international policy debate.

- *Productivity of the public sector and its impact on aggregate productivity.* While this topic has been addressed in Australia and New Zealand, and is noted by the UK, productivity commissions in the EU have not yet focused much of their work on this issue.

Despite the many similarities, it is not always clear how the commissions set their agenda. In Australia and New Zealand, the topics for inquiries related to productivity are largely set by the government, although both commissions also engage in their own research. However, in European countries, the commissions are – in principle – functionally autonomous from government and can set their own agenda within their mandate. In some EU countries, like Finland, France, and Portugal, the first reports produced in 2019 or 2020 established an empirical underpinning for further analysis and subsequent reports deepened the analysis and policy reflections. Political considerations do influence agenda setting, however, as commissions are expected to respond to emerging policy issues and political realities. For example, Belgium's Central Economic Council provides suggestions for future topics that could be addressed by Belgium's National Productivity Board (National Productivity Board, 2022). Moreover, the composition of the commissions – academic, government or multi-stakeholder – may also play a role in the topics that are being explored.

A question that cannot be easily answered through this review of national productivity reports is the impact that the commissions have on the national productivity debate, on policy development and implementation, and ultimately on productivity growth. Some commissions, such as the Australian Productivity Commission, reflect on the impact of their work in their annual report (Productivity Commission, 2022g). This report noted that the direct impact of its work on policy development is complicated to assess, as it is only one contribution to a policy outcome. However, Banks (2015) notes that the Australian government have accepted and implemented many of the recommendations by the Australian Productivity Commission in the past, notably in the areas of industry assistance and economic policy, with a more mixed record on social and environmental policy. Banks also notes the high economic benefits of the resulting reforms, e.g. in terms of higher productivity and lower prices. New Zealand's commis-

sion notes that "the influence of our work may only emerge over long timeframes, and it may be challenging to directly identify and attribute it to our work" (New Zealand Productivity Commission, 2023).

The commissions in Europe do not appear to assess their impact in a formal and public way, although several note their role in stimulating public debate on productivity, with Germany's commission noting its "significant influence on the political decision-making process" (Sachverständigenrat, 2023). In Ireland, however, the government publishes a formal response to the recommendations by the national commission in its annual report (Government of Ireland, 2022). More generally in the EU, according to the European Commission, commissions "with higher visibility are those based on an existing institution that during the years has managed to build up a good reputation among policymakers and the public at large" (EC, 2022). Moreover, according to Cavassini *et al.* (2022), "focusing on long-term challenges can enhance the institutions' influence and credibility".

Not all commissions provide specific policy advice, however, making the impact of their work on policy particularly difficult to assess. Outside the commissions examined in this article, Chile's productivity commission provides an interesting example, as it regularly measures the implementation of its recommendations on national policy in its annual productivity report (Comisión Nacional de Productividad, 2019; 2020). Further analysis on the impact of the commissions on policy development would be valuable.

Policies for productivity are not only complex, but also wide-ranging, which means there remains much work ahead for commissions to further disentangle the drivers of productivity and the policy levers that can be used to strengthen productivity and diffuse its benefits. 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.

This article suggests that productivity commissions are playing an important role in putting productivity back on the policy agenda and providing new evidence and policy advice. Countries that have not yet established their own commission may therefore wish to set one up to benefit from this new source of policy learning on productivity. Moreover, such countries may wish to draw on lessons learned in establishing such institutions, e.g. in ensuring their analytical independence and in providing access to all the necessary data to inform proposed policies and interventions with sound evidence (Banks, 2015; Cavassini, et.al., 2022).

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