Economic Policy Reforms 2023

Going for Growth

OECD

Economic Policy Reforms 2023

GOING FOR GROWTH

OECD
BETTER POLICIES FOR BETTER LIVES

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of the Member countries of the OECD.

This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Note by the Republic of Türkiye
The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Türkiye recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Türkiye shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Union
The Republic of Cyprus is recognised by all members of the United Nations with the exception of Türkiye. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Please cite this publication as:
OECD (2023), *Economic Policy Reforms 2023: Going for Growth*, OECD Publishing, Paris, https://doi.org/10.1787/9953de23-en.

ISBN 978-92-64-62233-3 (print)
ISBN 978-92-64-58372-6 (pdf)
ISBN 978-92-64-87328-5 (HTML)
ISBN 978-92-64-80399-2 (epub)

Economic Policy Reforms
ISSN 1813-2715 (print)
ISSN 1813-2723 (online)

Photo credits: Cover © r.classen/Shutterstock.com.

Corrigenda to OECD publications may be found on line at: www.oecd.org/about/publishing/corrigenda.htm.

© OECD 2023

The use of this work, whether digital or print, is governed by the Terms and Conditions to be found at https://www.oecd.org/termsandconditions.

Editorial

Creating the conditions for a decisive transition

Recent turbulence has severely disrupted societies and economies globally. The COVID-19 pandemic required unprecedented government responses across policy areas to protect lives and livelihoods. And as the pandemic receded, Russia's illegal war of aggression against Ukraine stressed energy and food markets, harming people everywhere and reducing growth.

We must keep long-term goals in sight when navigating a course out of difficult times. All governments are seeking to re-invigorate growth, improve livelihoods, and tackle climate change. This 2023 edition of Going for Growth shows how, with good policy making, structural reforms can boost economic growth, improve productivity, and reduce inequalities while transitioning to a zero-carbon future.

Our policy priorities and associated recommendations are grouped around four pillars: enhancing the efficiency of support; better use of resources; harnessing digital transformation and faster decarbonisation.

First, both the pandemic and the war have highlighted the importance of having robust social protection systems and exposed major deficiencies in the systems in place. In many countries, a significant share of workers, particularly the most vulnerable, fall outside social safety nets because of their work status. At the same time, social protection systems could be better targeted to reduce costs and improve sustainability.

Outcomes for workers and for the wider economy can be improved with policies which increase participation, improve the matching between jobs and workers, and support firms to become more dynamic, innovative, and greener. One source of the current weakness of potential growth is years of weak investment and capital accumulation. Policy can bolster firms' incentives to invest and upgrade their capital. Market competition also drives potential growth. Strengthening competition authorities and frameworks is critical, but often it is not enough. In most countries, boosting competition requires deeper regulatory reforms across a wide range of sectors, especially in services where regulatory barriers to the entry are still prevalent.

Third, recent advances in artificial intelligence underscore the vast potential of digitalisation to boost productivity and transform economies. Enabling firms and workers to reap the full benefits requires improvements across many policy areas. These include increasing investments in and widening access to broadband connections; strengthening firms' incentives and capability to acquire digital technologies and adapting business models. Fast progress in artificial intelligence also brings new challenges for governments and societies, requiring cooperation across stakeholders and policymakers – within and across countries – to ensure that these powerful tools are used for the benefits of all. Best policy practice has yet to be established in this area, but the OECD Council Recommendation on Artificial Intelligence provides a set of guiding principles for innovative and trustworthy AI developments.

Finally, decarbonising faster to meet climate change targets is the dominating challenge of our time. It will need both incentives-based policies and regulatory measures. Carbon pricing has an important role to

play. As do policies to increase public and green investment, and to strengthen regulations, institutions, and standards to reduce emissions.

These four pillars are reinforcing. Coherent climate and investment policies and effective structural reforms can work together to facilitate the transition and promote growth while protecting the most vulnerable. Early planning for the transition is essential to avoid stranded assets in carbon-intensive industries and stranded people and communities alongside them.

This edition has a special focus on trade where there are threats to unwind some of the benefits and miss out on further opportunities. Chapter 2 presents new OECD analysis which reviews trade integration through global value chains, identifies related risks, and prescribes policies to cushion them. Globalization has brought many benefits through higher productivity, lower prices, greater choice, and greater prosperity for billions of people, especially in emerging-market economies.

This 2023 edition of Going for Growth provides concrete advice to governments of OECD and partner countries. It sets out how structural policy reforms can improve medium and long term economic outcomes for millions of people across these countries, including the most vulnerable. And how this can be done while sharing those dividends widely and ensuring the green transition.

Clare Lombardelli

OECD Chief Economist

Table of contents

Editorial 3

Acknowledgements 9

ISO codes 10

Executive Summary 11

1 Overview 15
- Addressing the dual transition while strengthening fundamentals 16
- Snapshot of cross-country reform priorities in 2023 17
- Supporting vulnerable social groups during crises 18
- Removing obstacles to effective resource utilisation 23
- Securing faster progress towards decarbonisation 35
- Making the most of the digital transformation 42
- Bibliography 51
- Annex 1.A. The OECD Going for Growth framework for prioritisation of structural reforms 53

2 Risks and opportunities of reshaping global value chains 55
- Introduction and the main takeaways 56
- Trade globalisation: Trends and implications 58
- What can be done to reduce GVC risks? 70
- Bibliography 81

3 Country notes 89
- ARGENTINA 90
- AUSTRALIA 92
- AUSTRIA 94
- BELGIUM 96
- BRAZIL 98
- BULGARIA 100
- CANADA 102
- CHILE 104
- CHINA 106
- COLOMBIA 108
- COSTA RICA 110
- CROATIA 112
- CZECH REPUBLIC 114

DENMARK 116
ESTONIA 118
EUROPEAN UNION 120
FINLAND 122
FRANCE 124
GERMANY 126
GREECE 128
HUNGARY 130
ICELAND 132
INDIA 134
INDONESIA 136
IRELAND 138
ISRAEL 140
ITALY 142
JAPAN 144
KOREA 146
LATVIA 148
LITHUANIA 150
LUXEMBOURG 152
MEXICO 154
THE NETHERLANDS 156
NEW ZEALAND 158
NORWAY 160
PERU 162
POLAND 164
PORTUGAL 166
ROMANIA 168
SLOVAK REPUBLIC 170
SLOVENIA 172
SOUTH AFRICA 174
SPAIN 176
SWEDEN 178
SWITZERLAND 180
TÜRKIYE 182
UNITED KINGDOM 184
UNITED STATES 186

Metadata Annex 188

FIGURES

Figure 1.1. Going for Growth 2023 priorities across main policy areas 18
Figure 1.2. Social spending has been above its pre-pandemic level 19
Figure 1.3. Social protection lacks coverage 20
Figure 1.4. Transfers targeting could be improved 20
Figure 1.5. Key recommendations in social protection and active labour market policies 22
Figure 1.6. Financial disincentives to return to work remain high for minimum wage earners 22
Figure 1.7. Labour markets remained historically tight 23
Figure 1.8. The drivers of labour utilisation vary across groups of countries 24
Figure 1.9. Gender inequalities in labour market outcomes persist 25
Figure 1.10. Key recommendations to remove barriers to women's labour market participation 26

Figure 1.11. Weak labour productivity underpinned the decline in potential output 27
Figure 1.12. Differences in labour productivity across countries are mostly driven by TFP gaps 28
Figure 1.13. Faster product market reform can mitigate productivity divergence 29
Figure 1.14. Sound insolvency regimes can benefit productivity in intangible-intensive sectors 30
Figure 1.15. Key recommendations in product market regulation, competition and trade and FDI 31
Figure 1.16. Key recommendations on physical and legal infrastructure 32
Figure 1.17. Key recommendations on the structure and efficiency of the tax system 33
Figure 1.18. Key recommendations in education and skills 34
Figure 1.19. Key recommendations in innovation policies 35
Figure 1.20. Meeting 2030 emission reduction targets remains challenging 36
Figure 1.21. Key recommendations on energy transition 37
Figure 1.22. Carbon emissions remain under-priced 39
Figure 1.23. A large share of the global stock to be built in the next decade will still be used in 2050 40
Figure 1.24. Green bonds issuance remains modest in many countries 41
Figure 1.25. Digital adoption differs across countries and tools[1] 42
Figure 1.26. Key recommendations on the digital transformation 43
Figure 1.27. Disparities in connectivity remain large across countries 44
Figure 1.28. Regulatory barriers on communications could be eased further 45
Figure 1.29. Further adoption of digital tools could result in large productivity gains across firms 46
Figure 1.30. Skill shortages reduce gains from digitalisation in less productive firms[1] 47
Figure 1.31. Generic digital skills could be improved 48
Figure 1.32. The importance of work-based learning is varying across countries 49
Figure 1.33. The uptake of digital government services remains low in some countries 50
Figure 1.34. Illustrative productivity gains for firms from an increase in digital government use 50
Figure 2.1. Global trade integration remains high 59
Figure 2.2. Foreign dependencies vary across OECD countries 61
Figure 2.3. The geographic concentration of intermediate goods exports is high in some sectors 62
Figure 2.4. The geographic concentration of production is also very high for individual products 63
Figure 2.5. Energy import dependence is high in many OECD countries 64
Figure 2.6. Concentration of production of critical raw materials is high 65
Figure 2.7. Centrality differs across countries and sectors 67
Figure 2.8. Companies' intentions and implemented actions to boost supply-chain resilience 74

Figure 1.A.1. Going for Growth framework 54
Figure 1.A.2. Identification of the candidates for reform recommendations 54

Follow OECD Publications on:

https://twitter.com/OECD

https://www.facebook.com/theOECD

https://www.linkedin.com/company/organisation-eco-cooperation-development-organisation-cooperation-developpement-eco/

https://www.youtube.com/user/OECDiLibrary

https://www.oecd.org/newsletters/

This book has...

StatLinks

A service that delivers Excel® files from the printed page!

Look for the StatLink at the bottom of the tables or graphs in this book. To download the matching Excel® spreadsheet, just type the link into your Internet browser or click on the link from the digital version.

Acknowledgements

Going for Growth 2023 was prepared by the Economics Department's Going for Growth workstream: Nicolas Ruiz, Julie Johnsen and Agnès Cavaciuti, under the supervision of Filiz Unsal and Douglas Sutherland, and the general supervision of Luiz De Mello and Alain De Serres. Authors for Chapter 2 were David Crowe and Łukasz Rawdanowicz.

The Going for Growth exercise relies heavily on contributions from the Country Desks of the Country Studies Branch of the Economics Department and co-operation with other OECD directorates. The publication also benefitted from comments from country delegates. Editorial support was provided by Sisse Nielsen, Sarah Michelson-Sarfati and Ines Gomez Palacio.

Earlier drafts of the report were discussed by the Economic Policy Committee's Working Party No. 1. This report is published under the responsibility of the Secretary-General of the OECD.

ISO codes

ARG	ARGENTINA
AUS	AUSTRALIA
AUT	AUSTRIA
BEL	BELGIUM
BRA	BRAZIL
BGR	BULGARIA
CAN	CANADA
CHL	CHILE
CHN	CHINA
COL	COLOMBIA
CRI	COSTA RICA
HRV	CROATIA
CZE	CZECH REPUBLIC
DNK	DENMARK
EST	ESTONIA
EU	EUROPEAN UNION
FIN	FINLAND
FRA	FRANCE
DEU	GERMANY
GRC	GREECE
HUN	HUNGARY
ISL	ICELAND
IND	INDIA
IDN	INDONESIA
IRL	IRELAND
ISR	ISRAEL
ITA	ITALY
JPN	JAPAN
KOR	KOREA
LVA	LATVIA
LTU	LITHUANIA
LUX	LUXEMBOURG
MEX	MEXICO
NLD	NETHERLANDS
NZL	NEW ZEALAND
NOR	NORWAY
PER	PERU
POL	POLAND
PRT	PORTUGAL
ROU	ROMANIA
SVK	SLOVAK REPUBLIC

SVN	SLOVENIA
ZAF	SOUTH AFRICA
ESP	SPAIN
SWE	SWEDEN
CHE	SWITZERLAND
TUR	TÜRKIYE
GBR	UNITED KINGDOM
USA	UNITED STATES

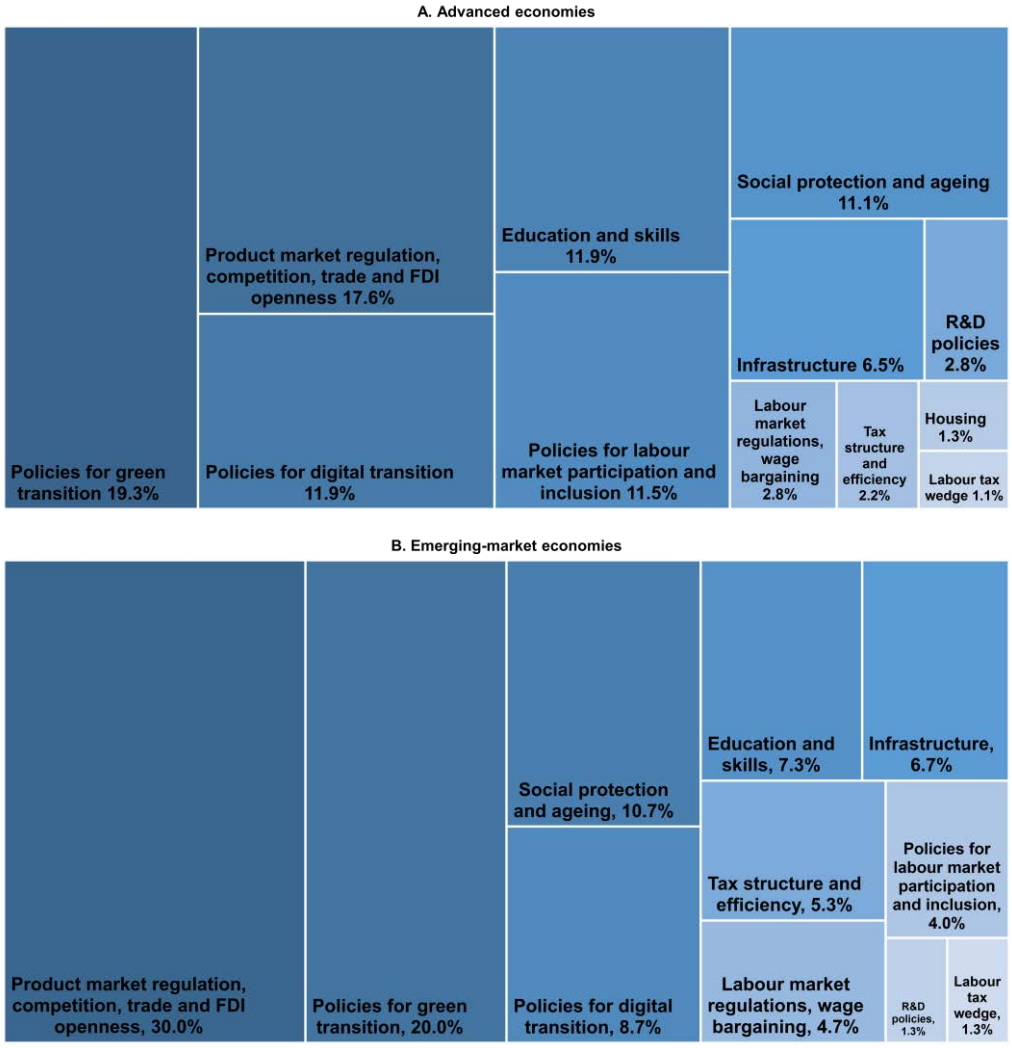
Executive Summary

Recent years have been dominated by shocks that have profoundly changed societies and economies, from the outbreak of the COVID-19 pandemic to Russia's war of aggression in Ukraine. Unprecedented policy responses have helped protect lives and livelihoods during this turmoil, but long-term and long-standing challenges remain to be addressed. Weak productivity growth and declining business dynamism remain prevalent in many OECD countries. Structural problems in labour markets still prevail and skill mismatches continue to hinder effective resource utilisation. Moreover, while its urgency is widely recognised, environmental sustainability has often remained absent from most growth strategies.

Going for Growth 2023 identifies country-specific policy recommendations for OECD and selected non-member countries to lay the groundwork for a stronger, more inclusive and sustainable growth (Figure 1). While there is no one-size-fits-all strategy, but the main pressing policy challenges identified in this edition can be grouped in four pillars: *i)* enhancing the design and management of support programmes; *ii)* removing obstacles to effective resource utilisation; *iii)* securing faster progress towards decarbonisation; and *iv)* making the most of the digital transformation as a driver of productivity growth.

Figure 1. Distribution of 2023 priorities across countries

Shares of policy areas based on the recommendations identified in the country notes



Enhancing the design and management of support programmes

The pandemic and then increases in energy and food prices have aggravated pre-existing social vulnerabilities, notwithstanding significant increases in public spending. Amidst soaring energy and food inflation, social protection systems struggled to deliver timely and targeted social support. Limited coverage has been a key factor hindering the delivery of support to the most vulnerable. In this context, a key recommendation in this edition of Going for Growth is to expand the coverage of social security and unemployment benefits to include self-employed and non-regular workers, especially in emerging-market economies with a large informal sector. Additionally, social protection programmes are often poorly targeted. Applying different targeting mechanisms, while also maintaining strong work incentives, could make support systems more effective in reducing poverty and building resilience, while also improving the overall cost effectiveness of social spending.

Removing obstacles to effective resource utilisation

The past decade witnessed a dramatic decline in potential output growth, which primarily reflects slower trend labour productivity growth. In turn, weak productivity growth can be traced back to low investment levels and slow capital accumulation. Competition is a key area where public policies can strengthen firms' incentives to upgrade their technologies, organisational structures, and business practices. The regulatory environment should encourage the entry of new firms and let them grow and enable unsuccessful firms to downscale or close. Insolvency regimes that do not over-penalise business failure facilitate this process. Reducing both economy-wide and sector-specific regulatory burdens, streamlining regulations, simplifying permit and licensing procedures and reducing the scope of state-owned enterprises while improving their governance, are other recommendations that could help in reviving productivity growth.

In other areas, public infrastructure investment can also act as a catalyst for private investments. The capacity and regulation of infrastructure in areas such as energy and transport could be enhanced in several countries. A sound legal framework is also critical to removing bottlenecks to growth, and a handful of OECD and non-member countries are recommended to take steps to strengthen the rule of law and judicial efficiency. Increasing public support for R&D is also warranted on a general basis, as investing in innovation involves considerable uncertainty while associated outcomes often have some public good qualities. Tax systems could also be made more growth- and equity-friendly, by shifting the tax burden towards immovable property, broadening the tax base, and reducing the fragmentation of the tax system. A shift to environmental taxation would also contribute to improving the sustainability of economic growth and wellbeing, provided measures are taken to ensure that lower-income households are not disproportionately affected.

Moreover, as knowledge remains a key driver for growth and innovation, furthering investments in education, upskilling and reskilling programs are also frequently identified recommendations. There is also a continuing need to promote labour market participation and improve work incentives, especially among vulnerable and under-represented groups. Reforms to foster inclusive and flexible labour markets, while limiting labour market dualism and incentives for early retirement, would be all essential steps in this regard. Moreover, and while progress has been achieved over the last decade, more could be done to increase female labour market participation, notably through the provision of childcare and parental leave, and improved tax incentives.

Beyond domestic borders, protectionist policies should be avoided. Globalisation has brought many benefits in terms of higher productivity, lower prices, greater variety of goods and accelerated income convergence of many emerging-market economies. However, globalisation is currently facing political headwinds, as national security and strategic considerations have gained traction, risking a more fragmented economic and political order. Chapter 2 of this edition provides new OECD material which reviews selected characteristics of trade integration via global value chains, identifies gaps in our understanding of the risks related to such chains, and outlines possible strategies to address global value chain risks. These include diversifying supply chains, friend or near shoring

and inventory management, with the latter two likely to entail higher costs.

Securing faster progress towards decarbonisation

Attaining decarbonisation by mid-century will require structural changes in the economy, notably by entailing substantial reallocation of workers and capital from emission-intensive activities towards greener activities. Carbon pricing, strong and predictable regulations, as well as investments in renewable energy are all essential components of this restructuring. Curtailing greenhouse gas emissions will not necessarily imply choking productivity and economic growth, but transition costs are likely to emerge in sectors that are most vulnerable to the climate transition. The public acceptability of mitigation policies can be improved by cushioning vulnerable social groups from these adverse effects of transition.

Emission pricing is a key element of any ambitious policy package to accelerate the pace of decarbonisation. Putting a price on emissions discourages the production and consumption of high carbon goods and spurs innovation and investments in low carbon technology. Across the OECD, there is still considerable room to improve emission pricing mechanisms Carbon price levels need to be raised and made uniform across energy sources and sectors. A clear and predictable regulatory environment can enhance the effect of carbon pricing and directly reduce emissions, particularly where fossil fuel demand is irresponsive to price signals. Accelerating both public and private investments in clean energy is also imperative to meet emission reduction targets. Importantly, for energy security purposes, the scaling down in fossil fuel investments should not run ahead of the scaling up in clean energy and network investments, and the two flows should not be viewed as isolated policy objectives.

Making digitalisation a driver of productivity growth

There is ample room to boost productivity through the adoption and diffusion of digital technologies. Policies that accelerate the digital transformation can also help strengthen the climate transition, as digital technologies can support more efficient flows of energy and more broadly help decouple economic activity from natural resource use. There are currently large gaps in access to, and use of, digital technologies across OECD countries. Public policies should aim at ensuring speedier diffusion while governments need to provide leadership in using and providing data and technology. Policies focusing on facilitating investments in, and access to, broadband connections, as well as policies ensuring a competitive business environment and lower entry barriers for new firms, are likely to spur incentives for digital technology adoption. This is especially the case for young firms, which often possess a comparative advantage in commercialising new technologies and thus create pressure on incumbent firms to adopt them as well. Policies that facilitate the movement and redeployment of workers and capital within and across firms, could also promote digital diffusion.

Human capital is fundamental in ensuring the effective adoption and use of digital technologies. The skills needed consist of specialised competencies from ICT professionals and generic skills for other workers, for a broad-based use of digital technologies. Attention should thus be given to enhancing the digital skills in the curricula proposed to students and expanding vocational education and apprenticeships. Lifelong learning has a central role to play in allowing all workers and job seekers to keep up with the digital transformation and not be left behind. Achieving so requires stepping-up investments in training, by providing individuals with opportunities to gain or improve their digital skills, ensuring that skills are matched with jobs within firms, and developing and maintaining high quality management.

1 Overview

The Chapter advises on country-specific structural policy priorities to strengthen growth fundamentals and pave the way for successful green and digital transitions. Four key policy areas are identified: enhancing the design of social support programs; lifting potential growth by removing obstacles to effective resource utilisation; securing faster progress towards decarbonization; making digital transformation a driver of productivity growth. Country specific information supporting this chapter is available in the country notes (Chapter 3).

Addressing the dual transition while strengthening fundamentals

The last few years have been dominated by massive shocks that have profoundly changed societies and economies. These shocks necessitated unprecedented governmental responses spanning multiple policy areas, helping to protect lives and livelihoods. Now the challenge is to move beyond the short-term policy responses to address the long-term threats to sustainable and inclusive growth.

The 2021 edition of *Going for Growth* highlighted the need for policy action to support a dual transition, through post-pandemic reallocation and convergence towards a low-carbon economy, while addressing pre-existing longer-term weaknesses. Those priorities remain. After the COVID-19 crisis, the post-pandemic recovery was gathering pace until the onset of Russia's illegal war of aggression against Ukraine, which led to a sharp increase in energy prices. Governments acted swiftly to support vulnerable social groups, who would otherwise face the risk of energy poverty and losses in living standards. These events have had an impact on immediate policy priorities, dwarfing long-standing challenges.

Now, reinvigorating economies is vital, but so is improving the quality of growth. Before the pandemic, many economies were struggling with sluggish productivity growth amid declining business dynamism. Structural problems in many labour markets included stubbornly high long-term unemployment and high informality in emerging-market economies. And while labour supply has recovered to pre-pandemic levels in most countries, labour and skill mismatches continue to hinder effective resource utilisation and contribute to ongoing tightness in OECD labour markets. Moreover, environmental sustainability, alongside more general resilience concerns, was often absent from growth strategies.

Going for Growth 2023 provides country-specific advice to lay the groundwork for stronger, more inclusive and resilient growth. The key structural challenges to be addressed are identified within the *Going for Growth* framework (Annex 1.A) and presented in the Country Notes (Chapter 3). The main pressing policy challenges are the following:

- *Enhance the design and management of support programmes in periods of crisis*: despite mounting pressure on public finances, the shocks related to the pandemic and the energy prices provide important lessons for the design of social protection. This is particularly important where untargeted, price-based measures have the undesirable potential of blurring the price signals needed to underpin the transition to a low-carbon economy.
- *Remove obstacles to effective resource utilisation to lift potential growth*: steering growth in a more durable, resilient and inclusive direction requires structural policy action to increase labour mobility and support firms in becoming more dynamic, innovative and greener. This is particularly important given adverse demographics in most countries, which will require gains in labour productivity to offset slower labour force growth over the medium-to-longer term.
- *Secure faster progress towards decarbonisation to attain climate change targets*: with appropriate policies and incentives in place, notably strong structural reforms combined with coherent climate policy, governments can secure convergence towards net-zero emissions trajectories. This requires action across a variety of policy areas, including the need to deal with transition costs for both businesses and workers.
- *Make the most of the digital transformation as a driver of productivity growth*: digital technologies are transforming economies and offer a vast potential to enhance productivity of firms. Improving policies in a range of areas can support digital adoption and thereby substantially lift productivity.

Snapshot of cross-country reform priorities in 2023

Going for Growth priorities are selected based on a combination of quantitative analysis of performance and policy weaknesses, and country-specific expertise (Annex 1.A). Priority reforms are identified, even for top performers, based on weaknesses in specific areas and identified emerging challenges. The primary objective is to set a policy agenda most likely to secure long-term improvements in performances across the dimensions covered (Figure1.1).

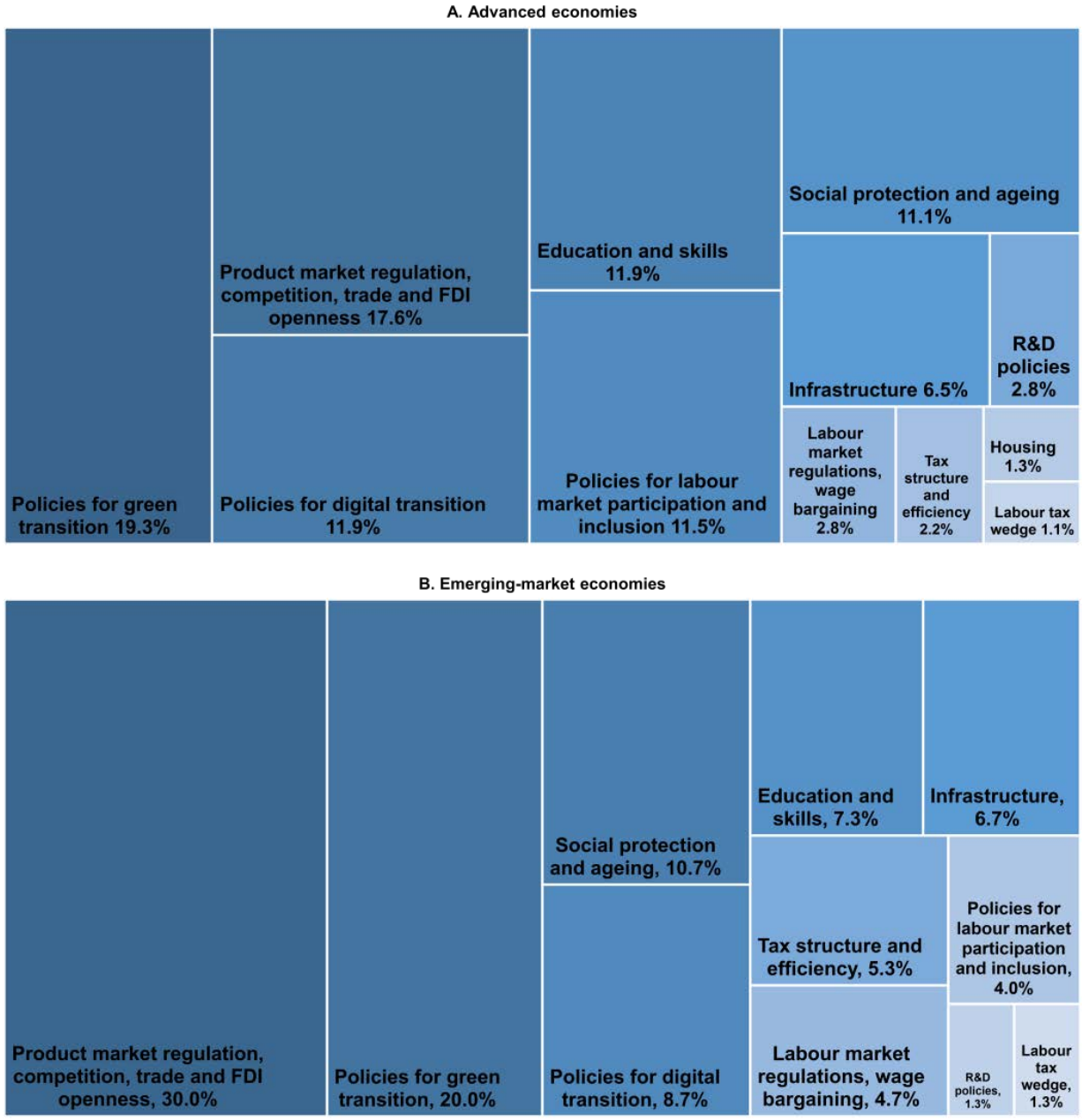
In this edition, climate change mitigation constitutes a large share of priorities in both advanced and emerging-market economies, underscoring the urgent need of accelerating the green transition. Increasing green and digital infrastructure investment, strengthening standards to enable a reduction in emissions, and increasing the scope and level of carbon pricing are frequently identified recommendations. Priorities to accelerate the digital transformation, which has the potential to contribute to decoupling economic activity from natural resource use and their environmental impacts, as well as reviving productivity growth over the medium and long term, are also prevalent. Some policy hurdles, such as barriers to investment in digital infrastructures and digital skills development, still hamper the effective deployment and use of these technologies.

In addition to these longer-term challenges, there is a need to address labour market functioning as well as capital accumulation, both of which have been pushing down productivity across the board. Prolonged labour market tightness, especially for certain sectors (manufacturing and lower-pay sectors) and groups (women and young workers) in many advanced countries, indicates that there is a need to promote labour market participation to contribute to productivity growth and to enhance the overall innovative capacity of the economy. To boost supply, it is key for countries to lift investment rates from their currently low levels, both for tangible and intangible capital. Most common policy priorities in this area include sector-specific and economy-wide regulations, with an emphasis on streamlining licensing and permits, as well as skills acquisition, which could all foster competitive pressures and business dynamism. Other priorities include shifting the tax burden from direct sources (labour and capital income) to indirect sources (taxes on consumption, immovable property, and carbon emissions) while broadening the tax base, enhancing physical infrastructure, and improving the efficiency of public administration. For emerging-market economies, priorities to boost business dynamism and knowledge diffusion account for an even larger share of the total priorities, and primarily include streamlining permits, lowering barriers to trade and investment, expanding regulatory impact assessment, improving the quality and accessibility of infrastructure, and strengthening the rule of law.

In this edition, policy priorities also focus on supporting vulnerable groups and helping current and future workers acquire or improve their skills to contribute to longer-term growth that benefit all. The key part of the skill priorities concerns the need to reform education, with expanding support to disadvantaged students, improving teaching quality, vocational education and training (VET), and expanding long-life learning having the largest occurrences. Priorities on R&D and innovation, such as strengthening collaboration between universities and industries, are further important in enhancing the skills needed for the digital and climate transitions. In emerging-market economies, the recommendations on education are equally critical, with priorities in skills linked to higher VET as well as primary and secondary education.

Figure 1.1. Going for Growth 2023 priorities across main policy areas

Percentage of total recommendations in the respective countries' groups



Note: Shares of policy areas based on the recommendations identified in the country notes.

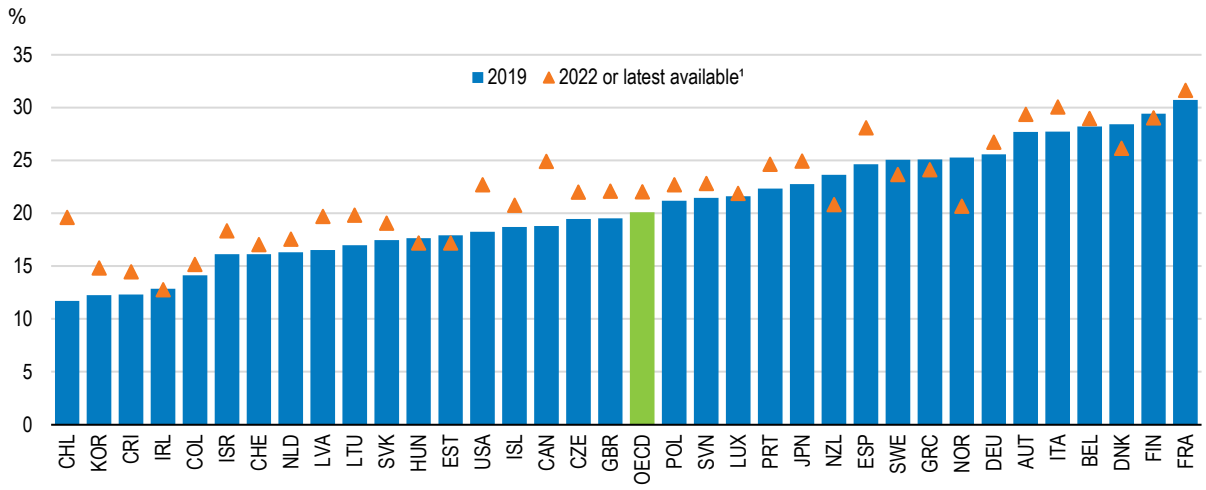
Supporting vulnerable social groups during crises

Social vulnerabilities may be aggravated due to the pandemic and the sharp increase in energy prices following the onset of war in Ukraine, despite significantly increased public support (Figure 1.2). On average across the OECD, the public social spending-to-GDP ratio increased by almost 3 percentage points during 2019-20, to about 23%. While provisional data for 2022 show a decrease by 2 percentage points, mainly due to the strong GDP rebound in 2021 and 2022, this ratio remains nonetheless above pre-

crisis level in most countries. With inflation having reached levels not seen over the past four decades in most OECD countries in 2022, real incomes were hit hardest among the lowest-income groups, and social protection policy is challenged to provide timely and targeted social support.

Figure 1.2. Social spending has been above its pre-pandemic level

Public social expenditure as a percentage of GDP



1. The last available year is 2020 for Canada, Japan and Costa Rica; 2021 for Chile, Colombia, Israel, New Zealand, the United Kingdom and the United States.
Source: OECD Social Expenditure Database.

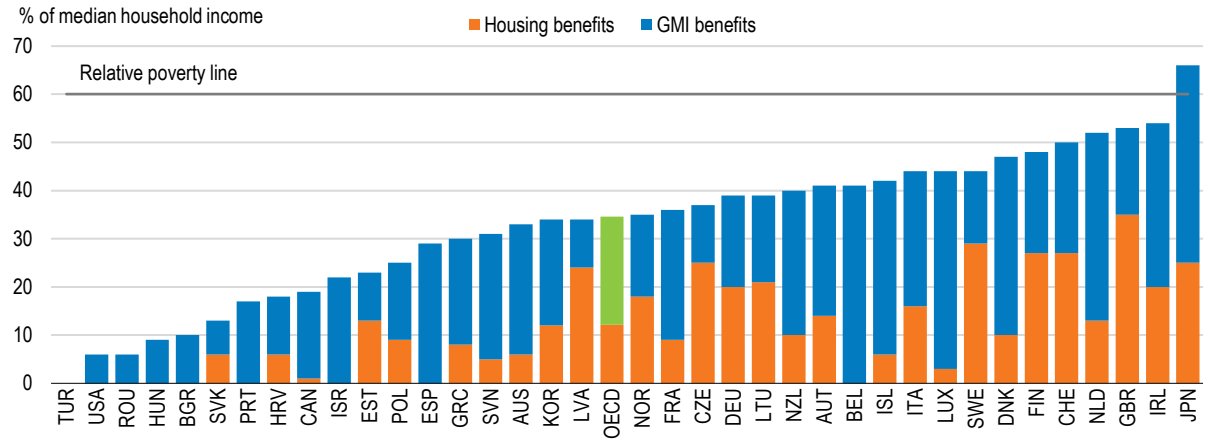
StatLink https://stat.link/kyfw0x

A pre-existing challenge in most OECD countries, which has made them ill-equipped to meet the needs of vulnerable social groups facing adverse economic shocks, is a lack of coverage of social protection systems. In many cases, social support does not reach those workers with the weakest attachment to the labour force, including the self-employed and those working in the informal sector or with non-standard contracts (OECD, 2019). For example, minimum income benefits cover less than 40% of median income, below the 60% threshold commonly used to measure poverty (Figure 1.3). A key recommendation in this edition of *Going for Growth* is to expand the coverage of social security and unemployment benefits to include self-employed and non-regular workers. This is especially relevant for emerging-market economies with a large informal sector such as in Colombia and Mexico, notably to encourage the creation of jobs in the formal sector.

In addition to limited coverage, social protection programmes are also often poorly targeted in many countries. Support programmes often fail to reach the intended beneficiaries, even when they are eligible for assistance, and end up benefiting social groups that may not be in immediate need of assistance. On average across countries, the same share of cash transfers reaches the poorest and the richest 20% of the working-age population (Figure 1.4, Panel A). Support to shield households and businesses from the impact of high energy prices has also been mainly untargeted (Figure 1.4, Panel B).

Figure 1.3. Social protection lacks coverage

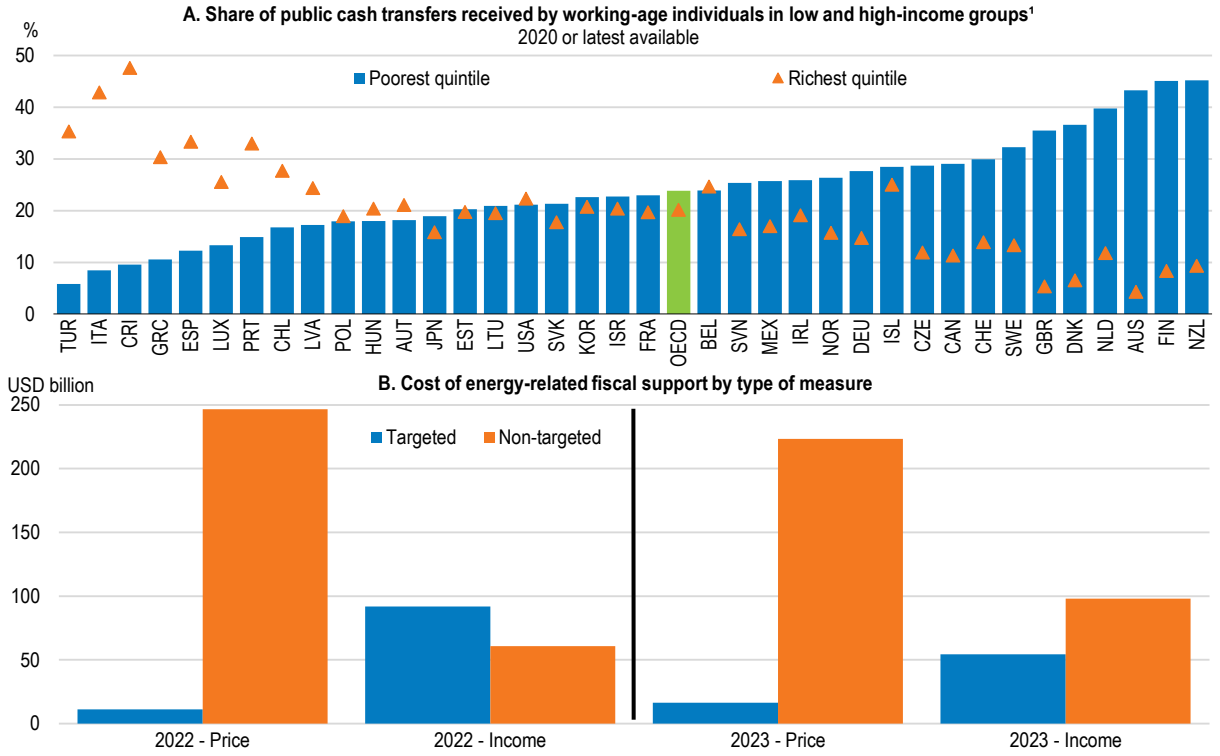
Guaranteed Minimum Income (GMI) benefits, [1] % of median disposable income, 2022 or latest available[2]



1. Situation of a jobless person without children.
2. The last available year is 2021 for Canada and Israel.
Source: OECD Tax-Benefit Models.

StatLink https://stat.link/0lcpzy

Figure 1.4. Transfers targeting could be improved



1. Ages 18-65, 2017 or latest pre-COVID year available. All public social cash transfers are measured at the household level, including any old-age pensions that are available for this age group. Income groups refer to disposable incomes. All incomes are adjusted for household size.
Source: Panel A: OECD Income Distribution Database, http://oe.cd/idd; Panel B: OECD Economic Outlook, Volume 2022 Issue 2.

StatLink https://stat.link/aj5uko

Better targeting of social support is indeed a key policy priority in this edition of *Going for Growth* (Figure 1.5). Targeting could also be considered in the design of various relief measures, as suggested in new OECD evidence on the recent energy price relief measures (OECD, 2023a). However, each targeting method comes with distinct benefits and costs (Box 1.1).

Box 1.1. Social support programmes: benefits and challenges of targeting

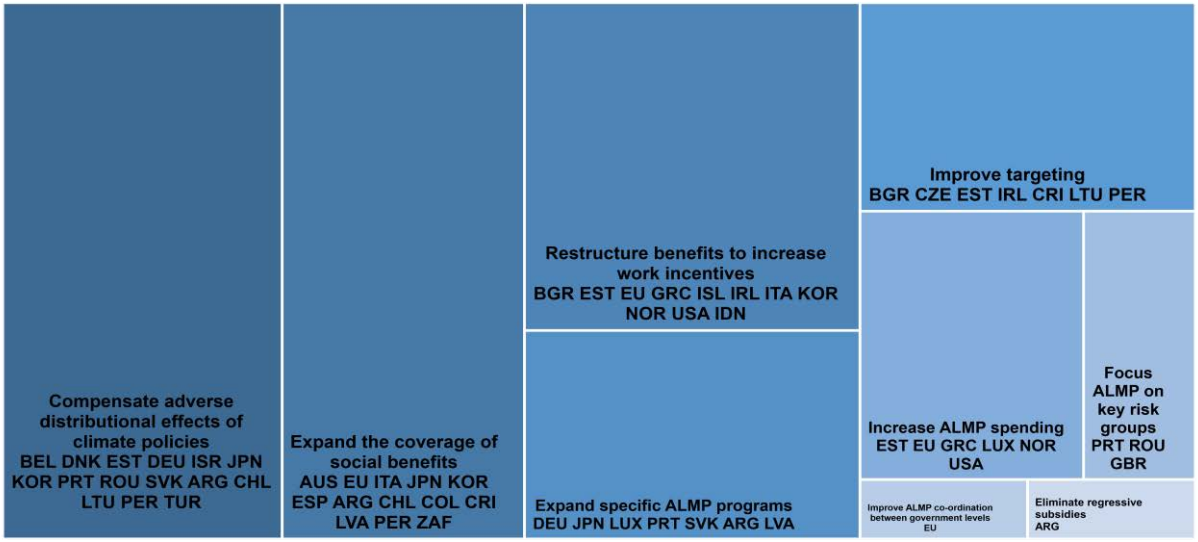
Targeting implies refocusing the provision of social support to distinct groups. Methods can be applied in the design of social transfers and benefits, but also in the provision of training programs, ALMPs and other measures to promote labour market participation. When properly implemented, targeting measures can effectively help reduce poverty and build resilience among vulnerable households (Grosh, 2022).

There are various methods for discerning eligibility for social support, and there is no one-size-fits-all strategy in their application and selection. The choice should be guided by context and policy objectives, and each method comes with distinct benefits as well as specific costs. For instance, with means testing, eligibility is determined based on income or some financial asset. The benefit of this approach is that it can identify the most vulnerable directly. However, it can be administratively burdensome and cause some inaccuracies in countries with large informal sectors or low-quality administrative data. On the contrary, categorical targeting, which determines eligibility based on adherence to relatively easy-to-observe categories, such as age, employment status, family status etc., is simpler to administer and has the benefit of employing transparent and objective eligibility measures. Yet, categorical targeting may be less effective in reducing poverty, as eligibility is not determined based on income or financial resources.

Targeting is generally associated with higher administrative costs than universal programmes. Also, the risk of both exclusion and inclusion errors (where support is not given to eligible people or given to ineligible people) increases as one moves from universal support to more selected programs. Targeted social support can also create disincentives to take up work, particularly when eligibility for support is directly linked to salary income (i.e., for traditional means testing). However, disincentives to take up work may be less acute in schemes where eligibility is not only or not directly dependent on income, such as categorical targeting or proxy means-testing (where eligibility is determined based on adherence to an indicator often correlated with poverty).

Increasing the quality of public data, enhancing data-sharing practices, and investing in the entire delivery chain of social support programs, can effectively reduce the administrative costs associated with targeting practices, and limit exclusion and inclusion errors thus improving their overall effects on poverty and household resilience. In Norway for instance, detailed household data and electronic payment systems allow the system for an extended child benefit given to single parents to be completely automated. The abovementioned investments may also improve the agility of social support systems in the face of economic crises, where the dynamics of economic welfare can be considerable. In fact, the countries that were best able to adapt their support systems to the COVID-19 crisis were countries that already had the digital capacity to react with high-coverage social data registers, linkable information between them, and existing account-based or digital payments, and amenable legislation (Grosh, 2022).

Figure 1.5. Key recommendations in social protection and active labour market policies

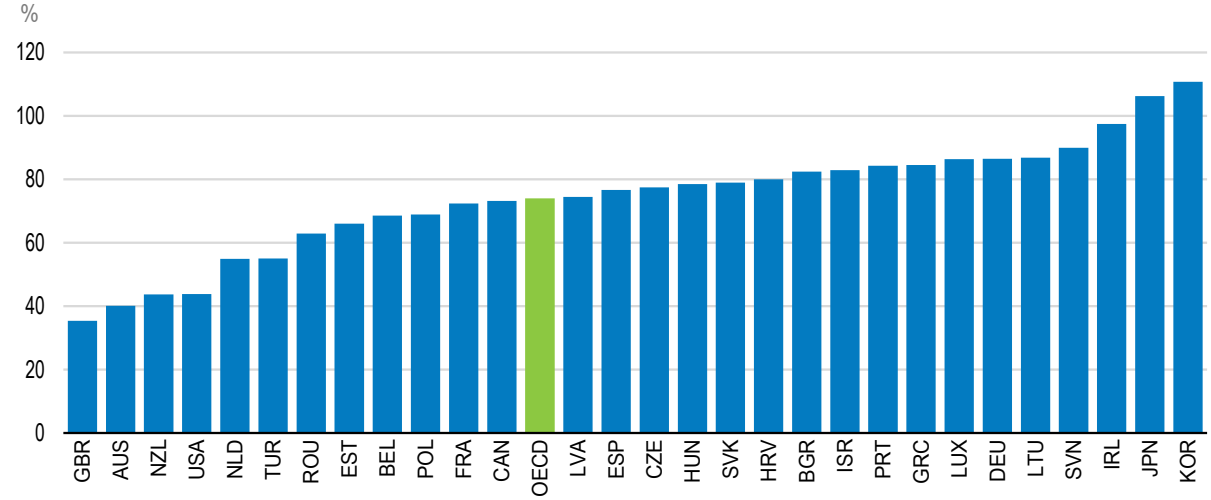


Note: Shares of policy areas based on the recommendations identified in the country notes.

The post-pandemic recovery has highlighted the need to ensure appropriate incentives for labour supply in the design of support programmes, to avoid amplifying labour supply constraints. This is a pre-existing challenge facing many countries, but the acute labour shortages that have emerged with the reopening of economies from the pandemic have brought these considerations to the fore. Financial disincentives to take up work often reflect the combined effect of taxes and benefits, particularly in higher-income countries where welfare states are comparatively more developed. On average across OECD countries, a jobseeker returning to work to earn the minimum wage after two months of unemployment is facing a 75% implicit marginal tax rate, due to higher taxes and lower benefits. This rate is above 100% in Japan and Korea (Figure 1.6).

Figure 1.6. Financial disincentives to return to work remain high for minimum wage earners

Percentage of earnings lost to either higher taxes or lower benefits when a jobseeker returns to work after two months of unemployment, 2022 or latest available[1]



1. Calculations refer to a person with two children whose partner works full-time at 67% of the average wage. The last available year is 2021 for Austria, Canada and Israel.
Source: OECD (2023), Financial disincentive to return to work (indicator). doi: 10.1787/3ef6e9d7-en (Accessed on 16 May 2023).

StatLink https://stat.link/vjni03

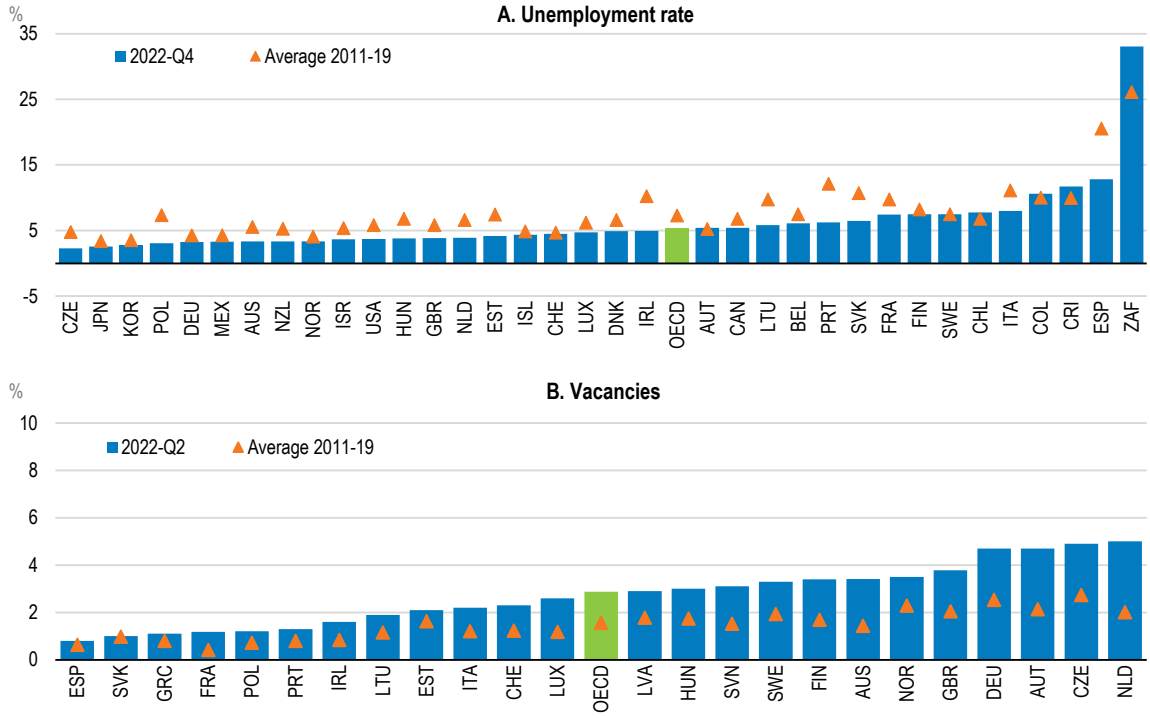
Reform options to enhance social protection also need to consider active labour market policies (ALMPs). While adequate income support should be provided during jobless spells, return to work should be encouraged by efficiently matching workers and jobs. This requires targeted policies, such as a more intensive and personalised approach to case management (e.g., regular face-to-face interviews and the development of individual action plans) as well as measures to find job opportunities that contribute to skills acquisition and work experience. The importance of ALMPs is well documented to achieve this, but reforms in this area are still needed, e.g., Japan, Luxembourg, and Portugal (Figure 1.5).

Removing obstacles to effective resource utilisation

The post-pandemic recovery in labour utilisation has been uneven

Labour markets remain generally tight in advanced economies. Labour market recovery has been strong, even if uneven across countries and sectors (OECD, 2022a). Indeed, employment rates have been relatively stable in Europe and Japan, owing to widespread reliance on job retention schemes, and bounced back swiftly in Canada and the United States, thanks to generous cash support. More broadly, tight labour markets have pushed unemployment rates to their lowest levels in the past two decades, coupled with unusually elevated vacancy rates (Figure 1.7). In Iceland, Switzerland, the United States, the United Kingdom as well as Colombia, Costa Rica, and Chile, labour force participation remains below its pre-pandemic level. Moreover, several countries have been reporting widespread labour shortages, particularly in manufacturing and construction as well as lower-pay sectors such as accommodation and food service activities (OECD, 2022a).

Figure 1.7. Labour markets remained historically tight



Source: OECD Economic Outlook, Volume 2022 Issue 2 and OECD, Economic Outlook Database.

StatLink https://stat.link/2yt8vd

Notwithstanding strong labour markets, some vulnerable groups are lagging behind in the recovery, and the continuing disadvantage of young workers in some countries is of particular concern given their higher risk of scarring (OECD, 2021a). Moreover, in many countries employment rates for women remain far below those for men (see below). Some other demographic groups, including older adults, also have low labour force participation rates (OECD, 2021a). These outcomes undermine the productive capacity of economies, pointing to the urgent need for policies to enhance labour force participation across groups and countries.

There are large cross-country differences in labour utilisation and its drivers

In many European countries, such as Austria, Denmark, Finland, Germany, Iceland, Norway, the United Kingdom, and to a lesser extent in France and Luxembourg, the gap in labour utilisation compared to the best OECD performers is largely the result of low average hours worked per worker (Figure 1.8). Low hours worked often reflect policy impediments or disincentives to full-time work, especially for lone parents and second earners. By contrast, in Belgium, Italy, Latvia, Romania, Spain, Slovakia, and also in Türkiye, Chile, Colombia, Costa Rica and South Africa, the labour utilisation gap can be explained by a comparatively low employment rate, while average hours worked per worker is relatively high.

Figure 1.8. The drivers of labour utilisation vary across groups of countries

Percentage difference vis à vis the upper half of OECD countries, 2021

Source: OECD, Productivity and Labour Force Statistics Databases.

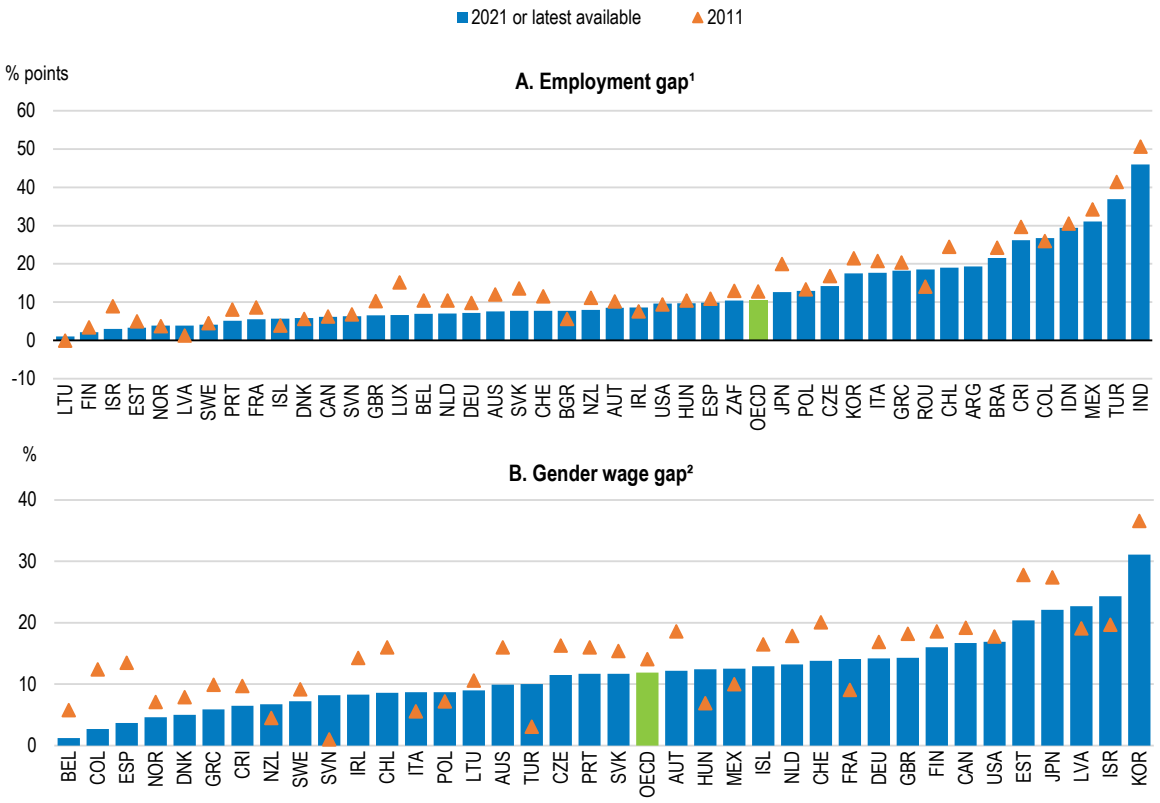
StatLink https://stat.link/0p8yj6

Fostering inclusive and flexible labour markets is a critical step needed to boost competition, mitigate supply shortages, and strengthen gains from digitalisation. Weak aggregate employment rates are often driven by low employment of specific groups, such as younger workers, older workers, women, minorities and the low skilled. Labour market dualism, the segmentation between workers with regular contracts with strong employment protection and those with contracts with little protection and little scope for on-the-job training, plays an important role in driving low employment. Other driving factors include incentives for early retirement or inadequate skills, which are also prevalent across OECD countries.

Reforms to remove barriers to women's labour market participation

Investments in gender equality can boost labour force participation, employment and output (OECD, 2018a). While there have been considerable improvements in women's labour market participation, their employment rate remains well below that of men, and gender pay gaps remain high across many OECD countries (Figure 1.9).

Figure 1.9. Gender inequalities in labour market outcomes persist



1. The employment gap is defined as the difference between men and women employment rates for 15–64-year-olds. The last available year is 2019 for Indonesia and 2020 for India (2010 instead of 2011 for India).
2. The wage gap is defined as the difference between median wages of men and women, expressed in per cent of median wages for men. Estimates of earnings refer to gross earnings of full-time wage and salary workers. The last available year is 2022 for Australia; 2020 for Belgium, Chile, Colombia, Denmark, Finland, Germany, Hungary, Italy, Latvia, Poland, Portugal and Switzerland; 2019 for Costa Rica, France, Greece and Israel; 2018 for Iceland, Ireland, Slovenia and Türkiye.
Source: OECD, Labour Force Statistics and Gender Databases.

StatLink https://stat.link/gvmxpu

Gender gaps in labour market participation can often be traced back to barriers or incentives related to the provision of childcare and parental leave, as well as the design of tax-benefit systems. Increasing access to, and lowering the cost of, non-parental childcare is one of the policy priorities identified in this edition of *Going for Growth* (Figure 1.10). Indeed, disproportionately high childcare cost is one of the main factors contributing to inequalities in childcare use across income groups (OECD, 2020a). Providing access to affordable childcare can not only boost maternal employment, but also benefit children's educational outcomes, especially for those from low-income backgrounds.

Improving parental leave is another key policy recommendation. The provision of adequate maternity leave has been shown to produce several societal benefits, such as lower infant mortality rates and health

benefits for the mother (Khan, 2020). Moreover, it tends to boost the female labour supply, by helping women reconcile work and family life, while strengthening their attachment to the labour market. On the other hand, in order to avoid prolonged periods of leave-inducing labour market detachment, the length of parental leave could be reduced in the Czech Republic, Korea, the Netherlands, Slovakia and the United Kingdom. Parental leave could also be reformed to provide additional support for mothers wishing to reintegrate the labour force. While many OECD countries offer parental leave to fathers, uptake remains low.

In some cases, countries would do well to reform tax-benefit systems to remove disincentives for women to participate in the labour market. This includes making the tax system neutral between main and second earners, as recommended for Italy and Spain. In addition, the tax system could be used to address certain fixed costs, such as childcare. This could be done through targeted support, child credits, or tax deductibility of childcare expenses.

Figure 1.10. Key recommendations to remove barriers to women's labour market participation

Note: Shares of policy areas based on the recommendations identified in the country notes.

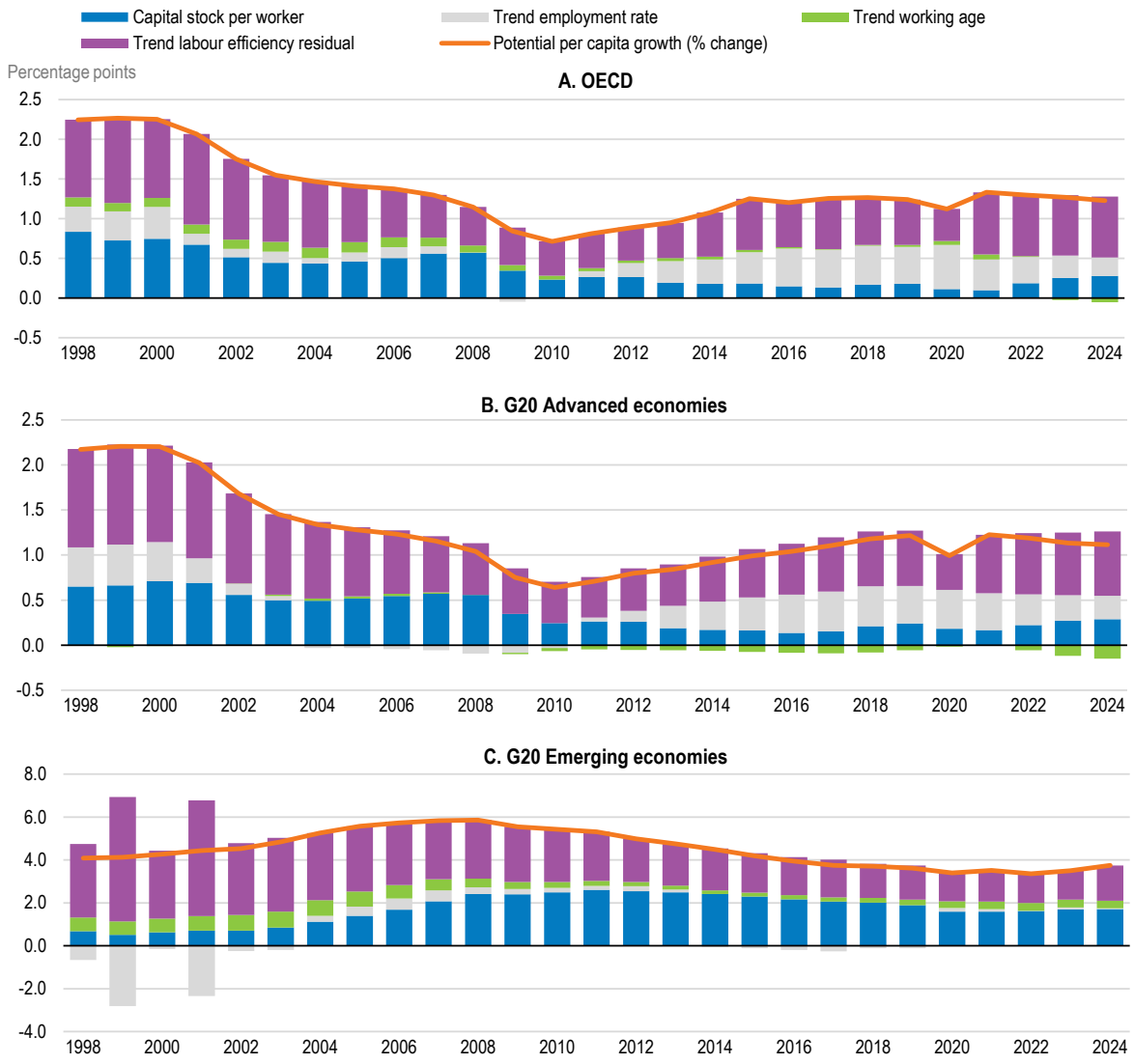
Boosting investment in various types of capital to revive productivity growth

Productivity growth had slowed even before the pandemic

While lifting growth has been a long-standing challenge in most countries, the current prolonged slowdown and weakened underlying growth prospects in the face of weak productivity growth highlight the critical role for supply-boosting structural reforms. The past decade witnessed a dramatic decline in potential output growth, which primarily reflects slower trend growth in labour productivity. Indeed, while labour productivity growth has been continuously trending downwards since the end of the 1990s for most OECD economies, coinciding with accelerating trade and capital integration, since the global financial crisis there has been a broad-based slowdown in productivity growth across both advanced and emerging-market economies (Andrews et al., 2016; Figure 1.11). The support for globalisation also eroded over the same period, entailing the risk of a more fragmented economic order that could weigh heavily on future productivity performance. Chapter 2 specifically reviews selected characteristics of trade integration, their implications, and then outlines general strategies to better understand and mitigate global values chains risks.

Figure 1.11. Weak labour productivity underpinned the decline in potential output

Contribution to potential per capita growth



Source: OECD, Economic Outlook Database 113.

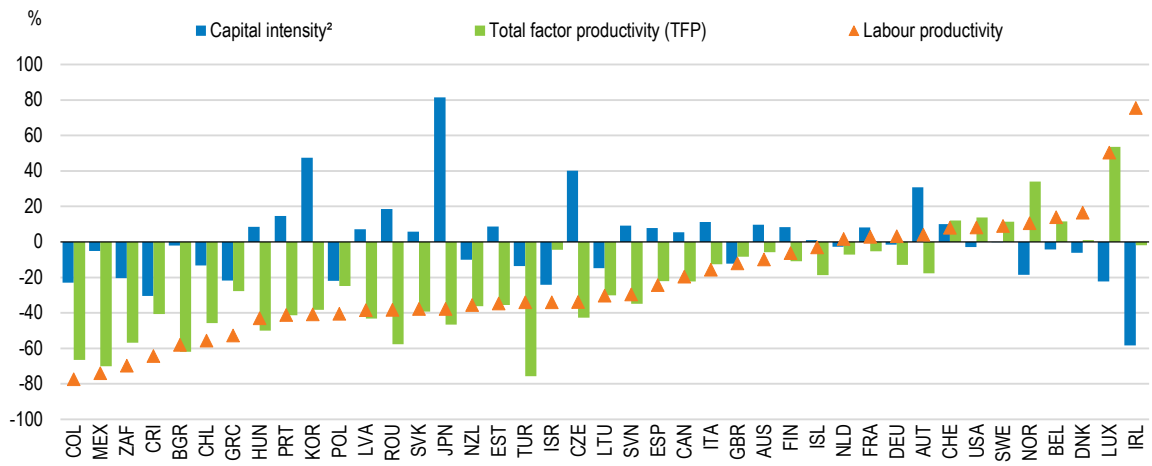
StatLink https://stat.link/5ohtwb

Productivity varies across countries

Cross-country differences in labour productivity are explained by a combination of gaps in the capital stock and total factor productivity (TFP) (Figure 1.12). While TFP gaps are more pronounced in emerging-market economies, in other countries, such as Austria, Czech Republic, Korea and Japan, TFP is relatively weak while capital per worker is comparatively high.

Figure 1.12. Differences in labour productivity across countries are mostly driven by TFP gaps

Percentage difference vis à vis the upper half of OECD countries, [1] 2021



1. Gaps in capital intensity and total factor productivity are compared to the weighted average using population weights of the 19 OECD countries with highest labour productivity in 2021 (and compared with highest GDP per capita in 2021 for the gap in labour productivity).
2. Capital deepening refers to the ratio of productive capital stocks over GDP (volume).
Source: OECD, Economic Outlook Database.

StatLink https://stat.link/ldy8zb

Lifting investment

Weak productivity growth since the mid-2000s, and most notably since the global financial crisis, can be traced back to slow capital accumulation, despite a gradual decline in the cost of capital. This includes tangible capital, such as equipment, machinery, and buildings, as well as intangible capital, which encompasses a range of assets from digital (software, data), intellectual property (R&D and patents) and organizational capital (Andrews and Criscuolo, 2013). Lower investment in these areas implies that firms do not devote sufficient resources to upgrading their technologies, their modes of production and their business practices more generally, resulting in lower productivity growth.

Making the most of these investments requires complementary investment in skills, both managerial and technical. Indeed, about one-third of the labour productivity gap between firms at the productivity "frontier" and a typical, medium performer of the same industry can be explained by gaps in skills (Criscuolo et al., 2021a). Moreover, managerial skills play a particularly important role, also through complementarities with worker skills. Gender and cultural diversity among managers – and to a lesser extent, among workers – is positively related to firm productivity as well. Moreover, the pandemic-induced shift towards more remote work underscores the need for upskilling the labour force, including in particular in the digital and managerial areas, to adapt to a new hybrid work environment (Criscuolo et al, 2021). In other words, public policies have a crucial role to play to enhance the productivity benefits of workers and managers by raising the quality and quantity of human capital (*supply*), by promoting skill upgrade (*training),* and by facilitating productive matches of workers to jobs.

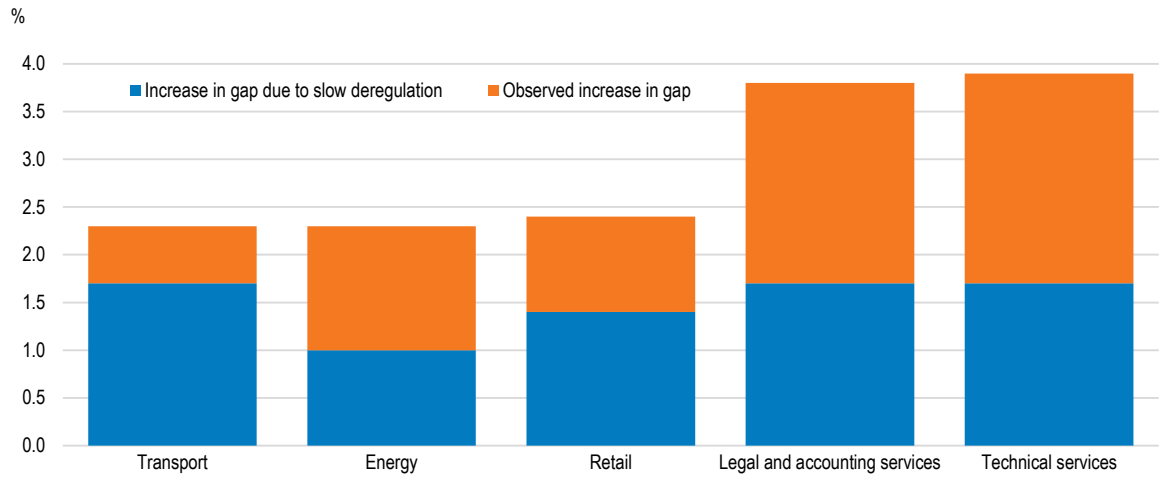
To boost firms investment in physical, intangible, and human capital, firms need to have not only the capabilities but also the right incentives. Competition is one key area where public policies can play a crucial role to ensure that firms want to keep improving. This is true not only for the most innovative businesses at the top end of productivity performances, but also for those who rely on adoption of the latest technologies or best practices from these leading firms. However, a large body of evidence suggests a weakening of competition in several major OECD economies. In particular, industry concentration and

mark-ups have been rising (De Loecker et al., 2020), the entry and exit of firms have been falling (Akcigit et al., 2021; Calvino et al., 2020), and the gap between the best firms (the productivity "frontier") and the other firms has been growing (Andrews et al., 2016).

Regulations in product, labour and capital markets should thus aim to keep promoting competition and adapt to the evolving nature of markets, for instance, due to more intensive digitalization. Competition-friendly product market regulation can sharpen the incentives for incumbent firms to adopt the latest technologies. Moreover, by enabling low barriers to entry, pro-competitive regulations can foster entrepreneurship and related experimentation with new business models and technologies, potentially contributing to closing productivity gaps (Figure 1.13). Insolvency regimes that do not excessively penalise debtors can also have similar beneficial effects, by facilitating the exit of less productive firms to free up resources to productive incumbents or entrants, spurring productivity overall, in particular in intangible-intensive sectors (Figure 1.14). Labour market regulations should also avoid putting a burden on workers who wish to move across space, by limiting unnecessary differences in the licensing requirements of certain occupations, so that workers have also appropriate incentives for finding more productive matches to jobs (Bambalaite et al., 2020).

Figure 1.13. Faster product market reform can mitigate productivity divergence

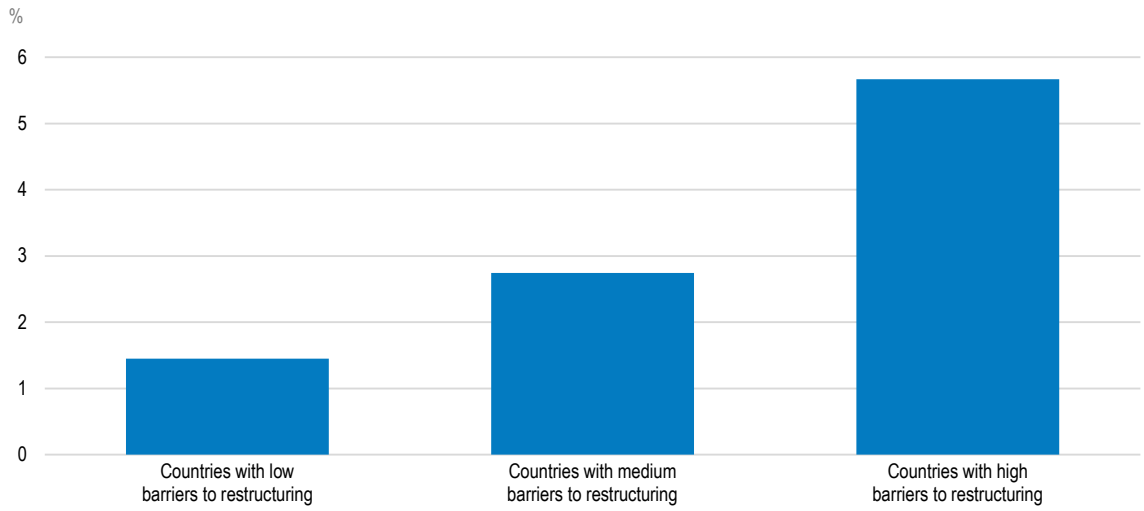
Estimated contribution to the annual change in the multi-factor productivity gap of the slower pace of reform relative to the fastest reforming industry[1] (telecoms)



1. The Figure shows the annual change in the multi-factor productivity gap between the frontier and laggard firms, and the part that is explained by slower deregulation than that observed in the fastest deregulating industry (telecom).
Source: Andrews, D., C. Criscuolo and P. Gal (2016), "The Best versus the Rest: The Global Productivity Slowdown, Divergence across Firms and the Role of Public Policy", OECD Productivity Working Papers, No. 5, OECD Publishing, Paris, https://doi.org/10.1787/63629cc9-en.

Figure 1.14. Sound insolvency regimes can benefit productivity in intangible-intensive sectors

Productivity gains (in high relative to low intangible-intensive sectors) from moving to the regime best suited to reduce barriers to corporate restructuring[1]

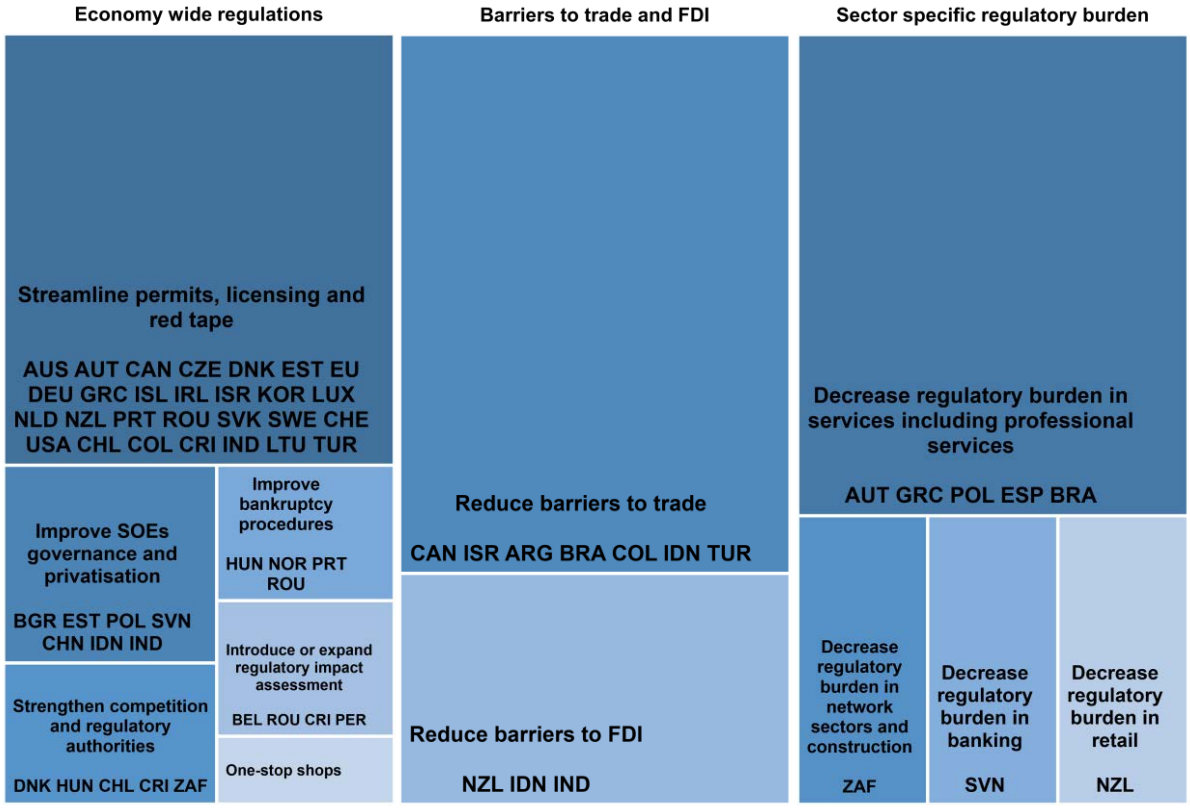


1. The Figure shows the differential productivity increase in intangible-intensive sectors compared to traditional sectors following an increase in insolvency regime soundness to the highest level according to the World Bank index latest year (2019). The estimation is carried over the 2007-15 period due to data availability and covers up to 28 countries.
Source: Demmou, L. and G. Franco (2021), "Mind the financing gap: Enhancing the contribution of intangible assets to productivity", OECD Economics Department Working Papers, No. 1681, OECD Publishing, Paris, https://doi.org/10.1787/7aefd0d9-en.

Reforms to economy-wide and sector-specific regulations

Reducing both economy-wide and sector-specific regulatory burdens continues to be key in reviving productivity in many countries. Frequently associated recommendations include streamlining regulation while facilitating firm entry through simplified and transparent permit and licensing procedures, reducing the scope of state-owned enterprises while improving their governance, and strengthening competition frameworks (Figure 1.15). Limiting sector-specific regulatory burdens, especially in non-manufacturing, i.e., retail trade and professional services as well as network industries, should also take priority, to spur productivity and promote allocative efficiency (Bambalaite et al., 2020).

Figure 1.15. Key recommendations in product market regulation, competition and trade and FDI



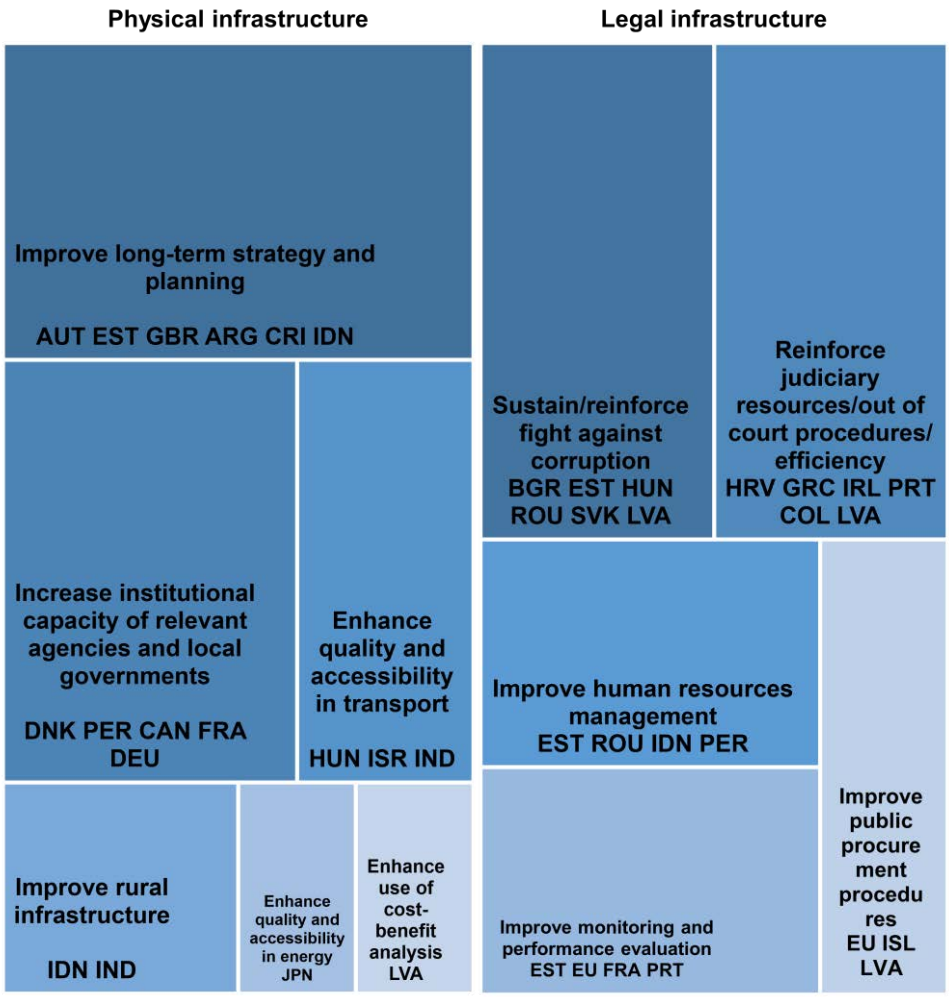
Note: Shares of policy areas based on the recommendations identified in the country notes.

As mentioned, a regulatory environment that encourages the entry of new firms and enables them to grow, and in turn reassures unsuccessful firms to downscale or close down, can also enhance business dynamism and productivity. Indeed, policies that promote more efficient firm entry and exit feature regularly in *Going for Growth*. In practical terms, this calls for bankruptcy legislation that does not excessively penalise business failure, which remains a priority in Hungary, Norway, Portugal and Romania (Figure 1.15).

Reforms to improve physical and legal infrastructure

Public infrastructure investment contributes both directly and indirectly to the economy-wide capital stock, including through its role as a catalyst for private investment. Indeed, enhancing the capacity and regulation of infrastructure is a priority in several advanced countries (Figure 1.16), with emphasis on addressing infrastructure shortages in transport, energy, or both in a cost-effective way, as is the case in Canada and France. Infrastructure provision - quantity and quality - is also poor in many emerging-market economies and raising public investment should be accompanied by reforms of the regulatory environment to attract private investment and optimise its use. Removing infrastructure bottlenecks, such as those in transport, can contribute to higher employment in countries like Estonia, Indonesia, and Peru, by facilitating the matching of workers and jobs. In general, quality infrastructure is crucial to the mobility of goods and people and for improving business dynamism.

Figure 1.16. Key recommendations on physical and legal infrastructure



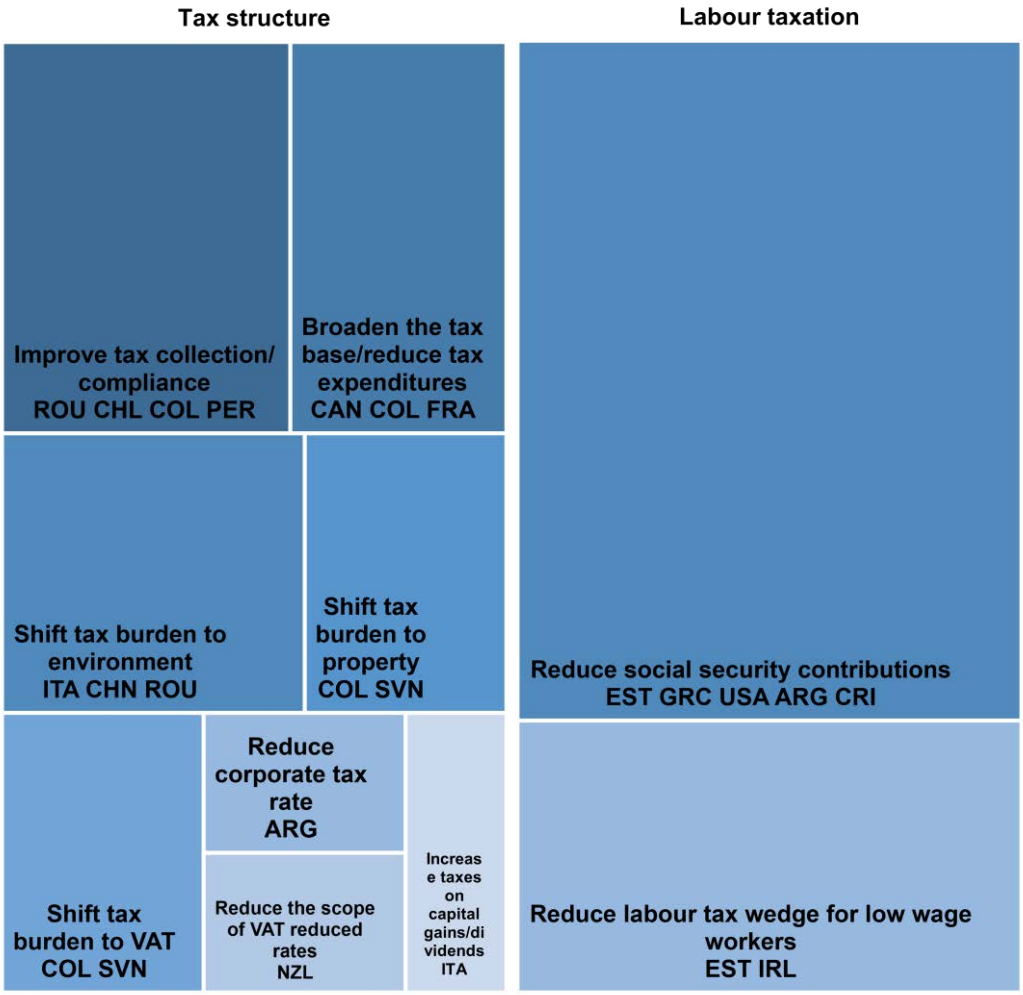
Note: Shares of policy areas based on the recommendations identified in the country notes.

In addition to well-developed tangible infrastructure, a sound legal framework is also critical to removing growth bottlenecks. *Going for Growth* provides policy options to strengthen the rule of law and judicial efficiency, with recommendations generally spanning the provision of security of persons and property, the enforcement of contracts and checks on corruption, as well as improvements in resource management and performance evaluation in public administrations. Recommendations in this area are identified especially in transition-market economies such as Bulgaria, Croatia, Latvia, Lithuania and Estonia.

Reforms to make the tax system more efficient

A more growth- and equity-friendly tax system can be achieved by shifting the tax burden towards immovable property, broadening tax base, and reducing the fragmentation of the tax system. A shift to environmental taxation can also help improve the sustainability of economic growth and well-being, provided measures are taken to ensure that lower-income households are not disproportionately impacted (see below). While countries still exhibit wide scope for improvement in this respect, and tax reform is among frequent priorities, recommendations vary depending on country-specific performance and policy weaknesses (Figure 1.17). Reductions in labour or corporate taxes are generally recommended alongside increases in various indirect taxes depending on country-specific sources of distortions. For example, in Argentina, Colombia, Lithuania and Slovenia, there is room to shift further the tax structure toward indirect taxation.

Figure 1.17. Key recommendations on the structure and efficiency of the tax system



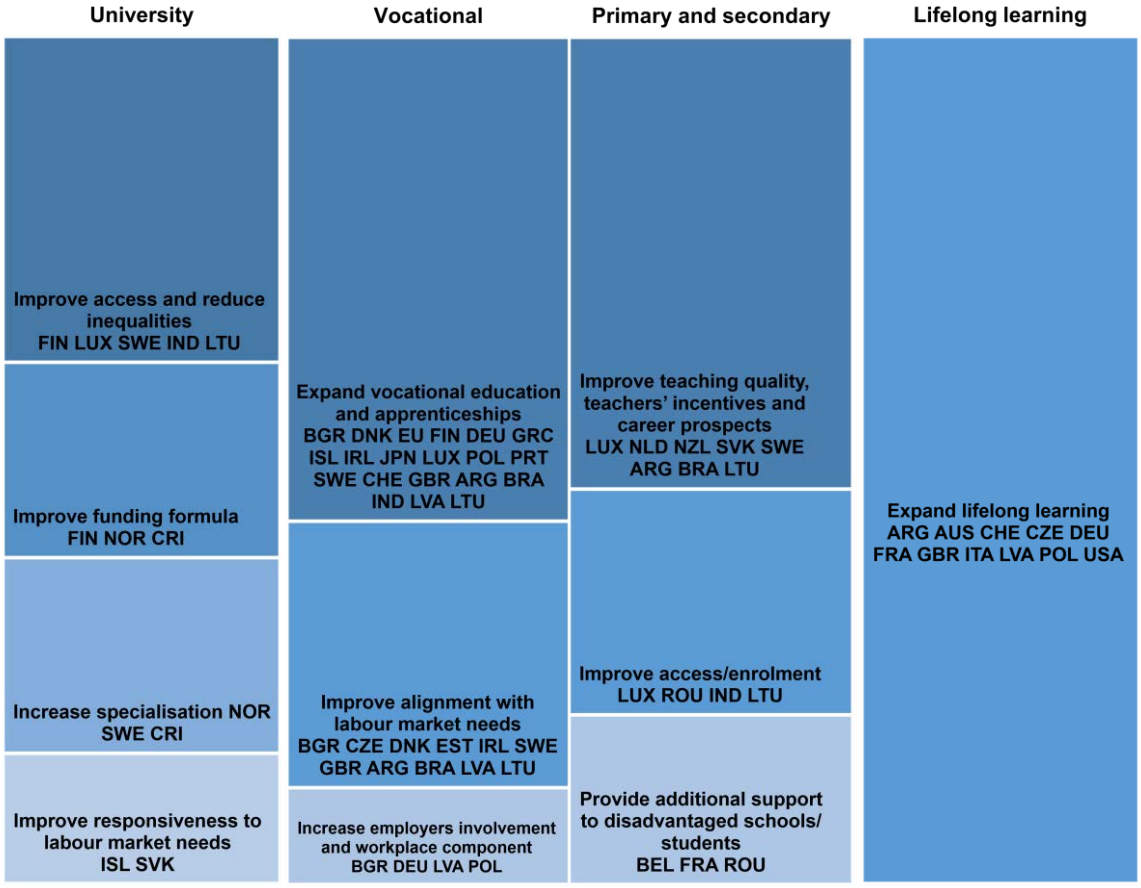
Note: Shares of policy areas based on the recommendations identified in the country notes.

Reforms to accelerate skills development and innovation capacity

Upskilling/reskilling policies are crucial as knowledge is a key driver of growth. Improving education and skills has repeatedly been identified as a priority for a vast majority of advanced and emerging-market economies, with specific recommendations varying depending on the sources of policy weaknesses (Figure 1.18). Despite widespread and sustained reform action in this area, challenges remain. Education and skills are also essential drivers of innovation. A strong network of knowledge transmission through R&D collaboration among firms, as well as between higher education institutes and firms, is conducive to innovation-led growth.

The success of the match between education and innovation relies on a broader range of -mostly intangible- assets such as employee skills, organisational know-how, databases, design, brands and various forms of intellectual property. Policies spurring investment in such assets should be complemented by appropriate framework conditions, as mentioned above, including product and labour market policies that encourage the reallocation of capital and jobs across firms, as well as effective insolvency legislation that does not penalise entrepreneurial experimentation. Thus, addressing the challenge of innovation cuts across most of the policy areas covered by *Going for Growth*.

Figure 1.18. Key recommendations in education and skills



Note: Shares of policy areas based on the recommendations identified in the country notes.

Priorities to improve the effectiveness of education systems

High-quality primary and secondary education should be prioritised in public funding because those are a prerequisite for raising skill levels and facilitating access to tertiary education. Increasing the quality of lower-level schooling across broad segments of the population is important for securing improved productivity but also for fostering inclusiveness, notably by achieving rising participation in higher education.

In primary and secondary education, reform recommendations focus on raising teachers' qualifications, addressing educational inequalities, and enhancing the targeting and effectiveness of resources devoted to disadvantaged students and schools (Figure 1.18). In the area of tertiary education, recommendations are more prevalent for higher-income countries, with a common challenge to improve university responsiveness to labour market needs (Figure 1.18). Similarly, recommendations in the area of vocational education and training (VET) also aim at responding to the challenge of aligning skill provision with labour market needs. Expanding or enhancing the effectiveness of VET will provide a better bridge between education and the labour market and is identified as a recommendation in several emerging-market and advanced economies.

Reforms to upskill and reskill

Enhancing growth and equality of opportunity through education and other skill provision programmes across the whole population, including low-skilled workers, is a policy priority identified in many OECD countries. People with low and medium levels of educational attainment face distinct challenges as they

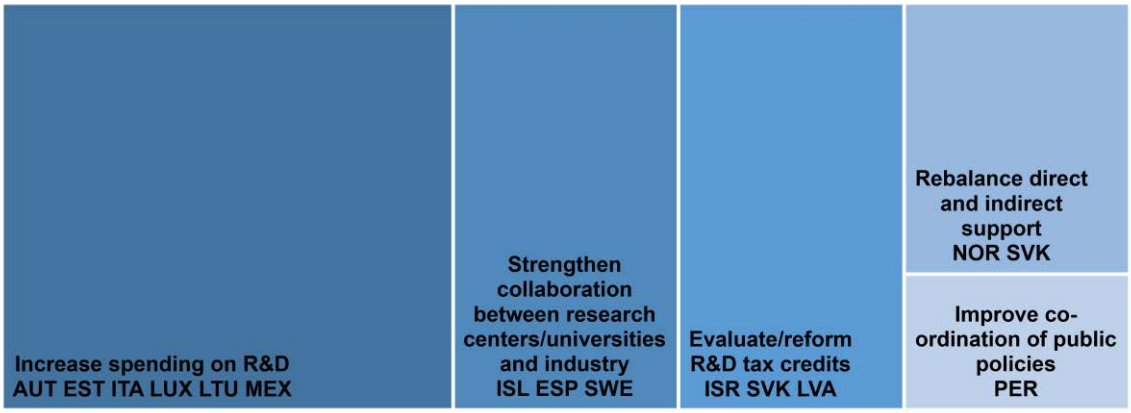
are overrepresented in informal sectors and face higher risk of job-losses, longer unemployment spells, and often weaker social security coverage (OECD, 2019). Increased digitalisation, combined with the stepping-up of climate change mitigation policies, can add to these challenges, as low-skilled and low-paid workers are overrepresented in polluting jobs and more likely to experience wage-reductions and job-losses along with the green transition (D'Arcangelo, 2022a). Recent evidence estimates that the policy package required to achieve net-zero emissions by 2050 would lead to about 2% of the global workforce changing the sector in which they work over the next 30 years, with workers moving from polluting, higher-emissions sectors to those that are cleaner and generate lower emissions (IMF, 2022).

Public policies need to provide adequate support to ease labour market adjustments and help efficient reallocation of workers, particularly for vulnerable groups. This can be done by equipping people with the appropriate skills, offering support to return to the labour force, and strengthening social safety nets. Efforts to keep or reconnect vulnerable groups to the labour market are one of the most effective ways to preserve living standards (OECD, 2022a). Reskilling should focus on the most vulnerable groups, who are more exposed to labour market adjustments but are less likely to participate in training (OECD, 2019). Key policy priorities in this area include removing time and financial constraints to training participation, tackling unequal access to training based on employment status, and making training rights portable between jobs.

Priorities to improve innovation capacity

There is further room for policy action in promoting innovation capacity. Efficient public support for R&D is generally warranted, as investing in innovation involves considerable uncertainty while associated outcomes often have some public good qualities - being widely shared within the economy and even abroad. In both advanced and emerging-market economies, recommendations on innovation also include strengthening collaboration between research institutes or universities and industry. A mix of incremental R&D tax incentives and selective direct grants is considered the best approach, with recommendations focusing on achieving a better balance between the two types of support, as recommended for Norway and Slovakia, and pursuing close evaluation of grant programmes (Figure 1.19).

Figure 1.19. Key recommendations in innovation policies



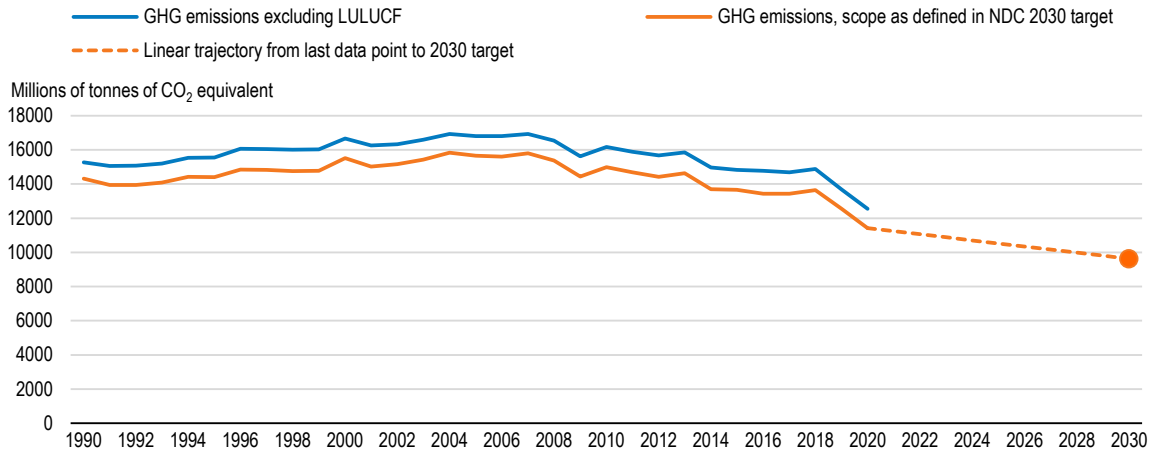
Note: Shares of policy areas based on the recommendations identified in the country notes.

Securing faster progress towards decarbonisation

Ambitious targets have been set in the wake of the 2015 Paris Agreement, with many countries committing to net-zero emission targets by 2050 to limit global temperature rise to "well below 2°C and as close as possible to 1.5°C relative to pre-industrial levels". Countries have also set intermediate targets for 2030, but action is needed to make sure these targets are met (Figure 1.20). At the global level, the policies in place are likely to be insufficient to put greenhouse gas emissions on a downward path before 2030 (IEA, 2022), making the goal of net-zero emissions by mid-century difficult to attain.

Figure 1.20. Meeting 2030 emission reduction targets remains challenging

OECD Greenhouse gas emissions[1] and Nationally Determined Contribution (NDC) 2030 target



1. Greenhouse gas (GHG) emissions, as scope defined in NDC 2030 target refers to recalculation of GHG emissions to fit to the NDC scope of each country. Each country's NDC 2030 targets and GHG emissions, as scope defined in NDC, are estimated following the methodology discussed in the OECD paper: "GHG Emissions Trends and Targets (GETT) Indicators: Harmonised Quantification of 2030 NDC GHG Emissions Targets" (forthcoming).
Source: OECD calculations based on OECD, Environment Database and OECD, IPAC, https://www.oecd.org/climate-action/ipac/dashboard.

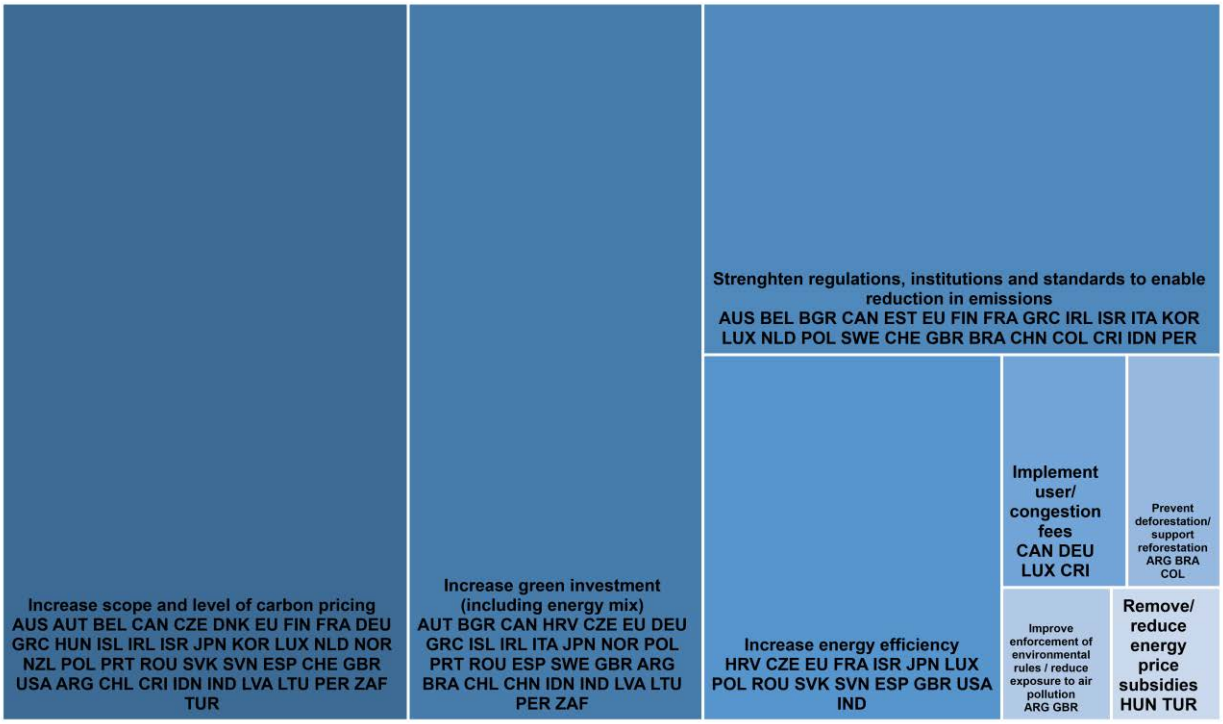
StatLink https://stat.link/pxif1v

Attaining decarbonisation by mid-century requires structural changes in the economy and will entail substantial reallocation of workers and capital from emission-intensive activities towards greener activities. Against this backdrop, *Going for Growth* recommendations can be grouped into three areas: *i)* increasing the scope and level of carbon pricing; *ii)* increasing green investment; and *iii)* strengthening regulations, institutions and standards to enable emission reductions. Most countries have recommendations in all three groups of this policy mix (Figure 1.21).

Several countries have introduced widescale reforms to support the transition. Recent initiatives include the United States' Inflation Reduction Act, foreseen to boost the growth of wind and solar capacity annually by 2.5 times, compared to 2022 growth, filling some of their gap in renewables penetration. In Europe, the Recovery and Resilience Facility aims to support achieving the EU's climate neutrality target by 2050, while promoting investments in digitalisation, productivity growth and job creation. In China, new targets for expanding clean energy capacity are expected to make the country's oil and coal consumption peak before 2030. Japan announced a Green Transformation (GX) plan at the end of 2022, which restarts some of the country's nuclear power plants as part of the policy package to reach carbon neutrality by 2050. At the same time, the use of carbon pricing has continued to rise, and new policies passed in 2022 in major energy markets are, compared to today, expected to increase annual investments in clean energy by 50% over the horizon of 2030 (IEA, 2022).

To the extent that climate change mitigation policies are appropriately designed and implemented, they will have impacts on productivity across firms and sectors. The ensuing restructuring of the economy will have heterogenous effects. For example, more productive firms when facing stricter environmental policies may be better placed to benefit from new opportunities as demand shifts towards greener goods. These firms may also benefit from being able to exploit technological spillovers and lower borrowing costs to restrain growth costs (Dechezleprêtre et al., 2019). By contrast, stringent environmental policy can raise costs and force less productive firms to downsize or exit the market. These dynamics create space for more productive firms to expand (Dechezleprêtre et al, 2020), thereby boosting aggregate productivity.

Figure 1.21. Key recommendations on energy transition



Note: Shares of policy areas based on the recommendations identified in the country notes.

The challenge restructuring poses will be exacerbated if the likely evolution of policy lacks clarity. With policy uncertainty firms will curtail investment, especially in capital-intensive sectors (Berestycki et al., 2022). In this light, minimising the costs of transition will require not only facilitating the reallocation of resources towards more productive and greener activities but also managing expectations about the future path of policy.

A second key challenge for the transition is managing the associated distributional impacts. Major transition costs will emerge or rise in specific sectors that are most vulnerable to the climate transition, such as mining and fossil fuel and energy-intensive industries, either due to higher input costs or changing demand patterns. This will also have repercussions for firms that are heavily reliant on these industries. Workers lacking the skills needed in the growing green activities will be at the greatest risk of job losses.

Public acceptability of climate change mitigation policies can be improved, primarily by cushioning vulnerable social groups from the adverse effects of transition (Figure 1.5). Individuals are also more likely to accept policy reform in this area when they have received sufficient background information to make better-informed choices. Close attention needs to be paid to phasing in policies to allow time for households and firms to adjust, especially when significant investment is needed. Recent cross-country evidence also suggests that the public is more likely to support climate change mitigation policies when a degree of revenue recycling is included in the reform package (Dechezleprêtre et al., 2022). In line with this, other recommendations in this area are using revenues from novel taxes to reduce existing taxes or make transfer payments and earmark revenue for environmentally related measures, notably for countering the adverse distributional effects of some policies (see section above).

Accelerating the adoption of digital technologies can strengthen the climate transition. Indeed, digital technologies can support more efficient flows of energy and increase interconnectivity between markets. They can also provide the necessary data to match supply and demand at a more disaggregated level and close to real time. The forecasting of energy production and demand can be improved by digital

technologies, such as sensors and smart meters and geo-localisation devices. This allows smart grids to adjust consumption to weather conditions affecting the production of intermittent renewable energy, and reduces the cost of integrating intermittent renewable energy in existing system, enabling its effective management and distribution, facilitating cross-border exchange, and preventing interruptions. Digitalisation also empowers people and businesses to shift consumption to green energy sources, adjust consumption to price signals, and even trade energy. While the energy and digital transitions are different in nature and each subject to specific policy challenges (see below), the policies needed to address them have the capacity to reinforce each other.

The dramatic changes in the energy supply required during the transition will call for policy action to make the electricity supply secure. For example, due to the intermittency of renewables, electricity systems will continue to rely on natural gas and gas-fired power plants in times of high demand (IEA, 2022). While phasing out gradually natural gas, at the same time existing natural gas infrastructure can support the deployment of low-carbon gases, e.g., biomethane, hydrogen, and synthetic methane, with generally low adaptation costs. However, this will require the development of new regulations for low-carbon gas markets.

Emission pricing is a powerful climate change mitigation instrument

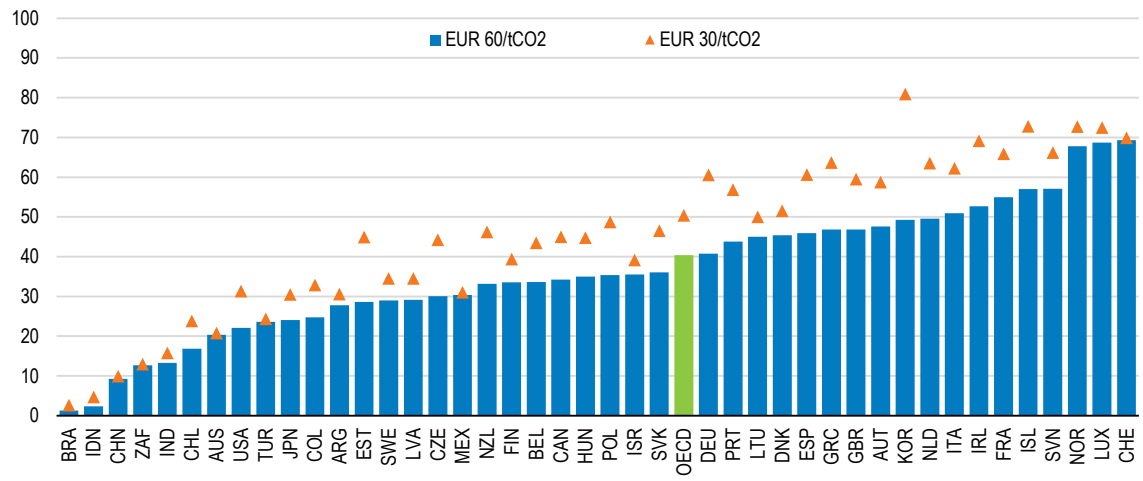
Accelerating the pace of decarbonisation will require ambitious packages of new policy measures, of which emission pricing is a key element. Putting a price on emissions discourages the production and consumption of goods with strong carbon content. It also provides a clear signal to investors about the interest in investing in low-carbon technologies (OECD, 2021b). Recent experiences have shown that a strong carbon price can effectively contribute to reducing carbon emissions. For example, after the United Kingdom added a Carbon Price Floor to EU ETS prices in the electricity sector in 2013, emissions decreased by 53% by 2018, and the share of coal in generation fell from 37% to 2%, a record low (Hirst and Keep, 2018). Making the carbon price uniform across energy sources and sectors is particularly important: it makes the instrument technologically neutral and does not require supervision to determine or anticipate which technology or process is the most effective, leaving firms to innovate and determine the best approach in their own environment and constraints (D'arcangelo et al., 2022b).

Strong and stable price signals are necessary but still lacking in most countries (Figure 1.22). Furthermore, a credible path of price increases will be needed to underpin progress towards carbon neutrality. Currently, in the 44 OECD and G20 countries, responsible for 80% of global emissions, 80% of emissions are priced below EUR 60/tCO2. Increases of carbon prices are among the top reform priorities in Australia, Brazil, Canada, the Czech Republic, Ireland, Iceland, Latvia and South Africa.

Emission pricing will not necessarily imply choking economic growth. Recent evidence from European countries shows that carbon pricing increases over the last three decades have had limited negative effects on aggregate GDP growth (Metcalf and Stock, 2020). Nevertheless, there have been heterogeneous effects across sectors (Dechezleprêtre et al., 2022). Moreover, revenue recycling allows governments to reduce distortionary taxation, supporting investment, job creation and bolstering public acceptability, insofar as government revenues are estimated to be large in the initial phase following the pricing (D'arcangelo et al., 2022a). Carbon pricing is nonetheless likely to reduce activity in sectors and firms that are heavier emitter. These results underline that carbon pricing generates winners and losers, requiring support that can be financed through the additional revenues generated, and reallocation policies to counter adverse distributional effects.

Figure 1.22. Carbon emissions remain under-priced

Carbon pricing score, [1] 2018



1. The carbon pricing score shows how close countries are to pricing carbon in line with carbon costs. EUR 60 is a midpoint estimate for carbon costs in 2020, a low-end estimate for 2030. Pricing all emissions at least at EUR 60 in 2020 shows that a country is on a good track to reach the goals of the Paris Agreement to decarbonise by mid-century economically. Including emissions from the combustion of biomass.
Source: OECD, Effective Carbon Rates 2021 Database.

StatLink https://stat.link/wv3dia

Pricing should be accompanied by other measures

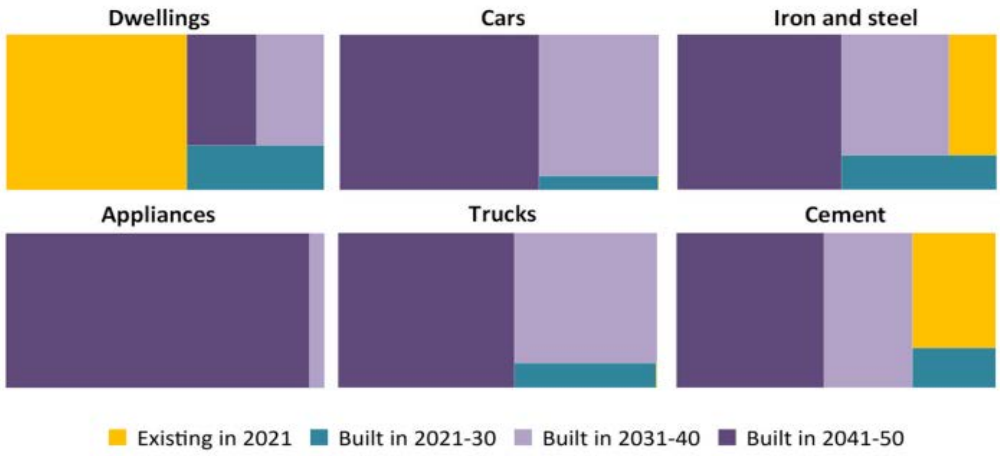
Regulations can complement carbon pricing where fossil fuel demand is irresponsive to price signals. In addition, they are powerful tools to improve efficiency in the use of energy and to encourage innovation that can lead to the development and adoption of greener technologies that can reduce the costs of abatement during the transition. For example, more than one-third of the vehicles and heavy industrial facilities that will be in use in 2050 are expected to come on stream in the next two decades (Figure 1.23). Making sure that these assets are in line with the latest energy-efficiency standards will help reduce energy intensity and emissions.

Another area requiring steadfast policy action is housing, which accounts for almost 30% of global energy-related emissions both through direct energy use and from power generation. Furthermore, urban form can influence emissions from transport activity. Implementing appropriate building energy codes will contribute to energy efficiency improvements and reductions in emissions (IEA, 2021). Balancing housing affordability and environmental concerns is nonetheless possible. Rethinking land use regulations, for example, may allow greater densification, higher housing supply and lower emissions (OECD, 2021c).

Making energy efficiency foundational in new investment will reduce energy demand, other things being equal, and the risk of potential future fossil-fuel disruptions. Such an approach may also reduce the burden for households and businesses in choosing appropriate technology. Improving the efficiency of currently existing assets is essential, particularly in the housing sector, a challenge identified notably for Eastern-European countries. One avenue to achieve this is earmarking tax revenues generated by emission pricing to subsidise innovation programs dedicated to improving efficiency.

Figure 1.23. A large share of the global stock to be built in the next decade will still be used in 2050

Shares of assets to be built during the next three decades and foreseen to be still in use in 2050



Source: IEA, World Energy Outlook 2022.

Investments in clean energy will need to accelerate to meet emission reduction targets, and a large share of countries have key policy recommendations identified in this area (Figure 1.21). Supporting public and private investment in these technologies will bolster the transition and complement carbon pricing and regulatory tools. The current times of high fossil fuel prices provide additional incentives to do so, but at the same time energy security concerns could also renew investments in fossil fuel supply. In the long run, increasing investments in fossil fuel will prolong the dependence on this energy source, slow the path of emissions reduction and delay the decline in demand. It will also increase the amount of stranded assets in the future. A deceleration of the energy transition can be avoided while still incorporating security objectives by coordinating clean energy investment with the reduction in fossil fuel investment. In fact, the scaling down in fossil fuel investment should not run ahead of the scaling up in clean energy investment, and the two flows should not be viewed as isolated policy objectives (IEA, 2022). If that were the case, in addition to heightening social discontent, this could lead to higher and more volatile prices. As such, coordinating the two will be essential in any forthcoming investment strategy, to deliver on both the mitigation and security fronts.

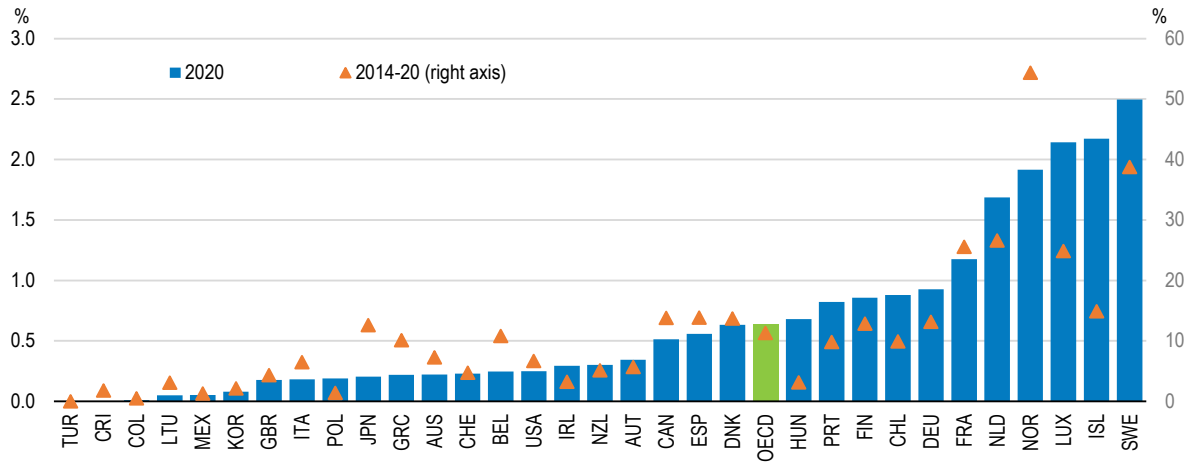
The International Energy Agency (IEA) estimates that investment in clean energy technologies needs to more than double from around USD 2 trillion recently to USD 5 trillion by 2030 (IEA, 2021). A large share of this investment is needed in electrification and the update and modernisation of electricity networks. Investment needs subsequently decline gradually as costs of renewable energy technologies are expected to continue falling. While energy investment has been rising recently (around 8% in 2022), this in part reflects rising capital investment costs (IEA, 2022), which suggest risks to the needed investment.

Against this background, accelerating investments in clean energy will deliver crucial and long-lasting solutions for climate outcomes. Government actions can contribute to this acceleration, by supporting private sector investment, through regulations and direct public investment. However, public debts after consecutive crises, higher interest rates and underlying spending pressures could constrain public investment. The participation of institutional investors (e.g., pension funds, insurance companies) in areas such as green infrastructure financing could be increased. Recent OECD research has shown that the total assets under management by these investors in OECD and G20 countries are at least USD 64.8 trillion (OECD, 2020b). When discounting for risk diversification and regulatory requirements, up to USD 11.4 trillion could be devoted to infrastructure-related assets. As of today, only USD 1 trillion is actually allocated to infrastructure-related assets, out of which around one-third are green infrastructure assets.

There is ample room to mobilise capital from institutional investors (D'Arcangelo et al., 2022b). Emerging digital technologies could also contribute to this mobilisation, among other objectives. However, this would require promoting direct infrastructure debt, a growing type of asset within which green bonds, while rising in use, remain relatively under-developed in most countries (Figure 1.24). Beyond barriers specific to the financial sector, such as low credit ratings for potential green bond issuers and green projects, or the lack of suitable securitisation and aggregation mechanisms, especially in emerging-market economies, structural challenges remain to be lifted to accelerate their development. For instance, in many countries a pipeline of infrastructure projects corresponding to a long-term governmental commitment to low-carbon development remains to be developed.

Figure 1.24. Green bonds issuance remains modest in many countries

As a percentage of GDP



Source: D'Arcangelo, F., et al. (2022), "A framework to decarbonise the economy", OECD Economic Policy Papers, No. 31.

StatLink https://stat.link/c59j17

Regulations should integrate energy security in their design

Large mitigation benefits can be reaped through a clear and predictable regulatory environment that can directly reduce emissions but also enhance the effect of pricing measures and the provision of low-carbon options. Identified as a key recommendation in several countries, regulations such as requirements for energy renovation, emissions tracking and green certification should be strengthened to facilitate mitigation while minimising costs. However, stronger regulations require careful design. Complying with new, more stringent standards and rules can entail substantial costs, asset decommissioning and repurposing, risking disruptions during the transition. Regulations can also have hidden adverse distributional impacts where compliance costs are borne disproportionately by vulnerable households and firms. In this context regulators should complement cost-benefit analysis with an assessment of energy security for new planned regulations, with the aim of minimising supply disruptions.

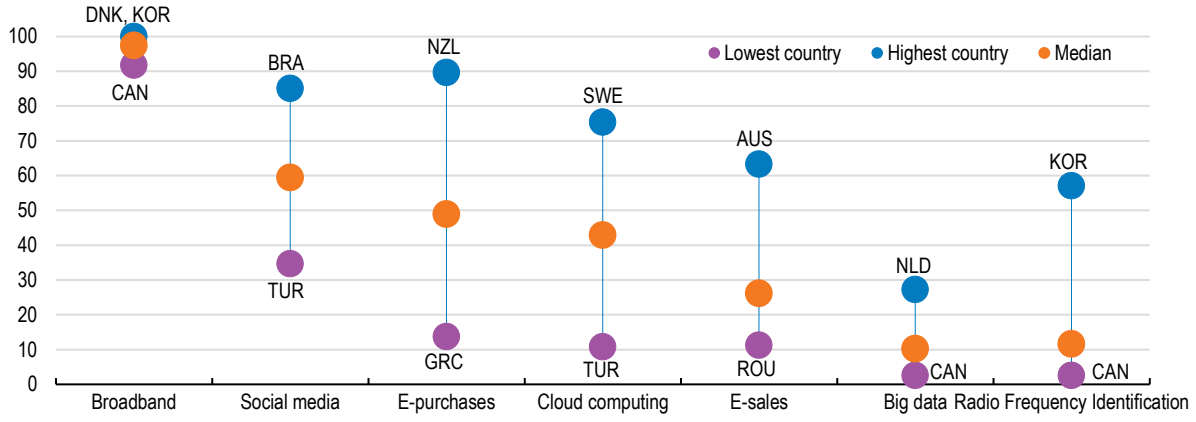
In some countries, reducing or removing regulatory barriers is also needed to facilitate the expansion of renewable energy. For example, in Estonia several regulatory restrictions hamper wind power development (OECD, 2022b). In France, administrative constraints for solar power appear to have hampered the development of this energy (OECD, 2021d).

Making the most of the digital transformation

Digital technologies have strengthened the resilience of economies and societies during the pandemic, underpinned by a surge in teleworking and remote education, alongside increased use of digital public and e-commerce services. Such transformations have the potential to contribute to the green transition and more broadly revive productivity growth over the medium-to-long term, by creating new entrepreneurial opportunities and spurring innovation. At the same time, some factors still hamper the effective deployment and use of digital technologies across all strata of society. To take further advantage of the digital transformation, large gaps in access to, and use of, digital technologies should be closed (Figure 1.25). Policies should ensure access by businesses and households to a broadband connection, equip workers with the needed skills to thrive in a digital economy and create the appropriate policy environment to support digital innovation. Furthermore, as the pandemic has renewed and anchored the role of digital government, both in its conventional delivery of digital services as well as an effort in managing crises, this edition identifies recommendations to boost digital government services in almost half of the countries covered (Figure 1.26).

Figure 1.25. Digital adoption differs across countries and tools[1]

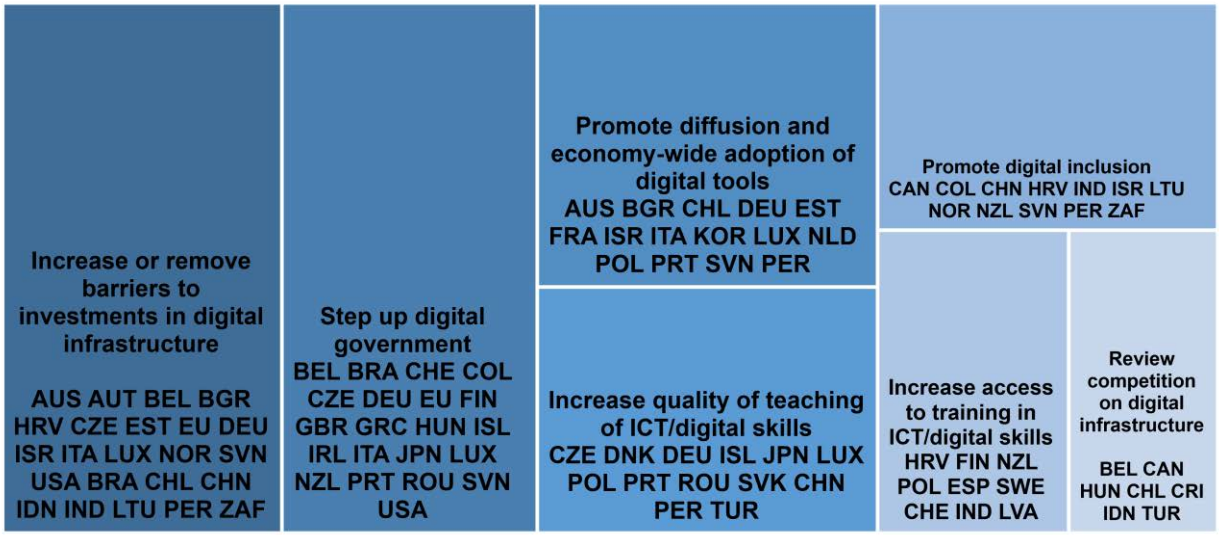
As a percentage of enterprises with at least ten persons employed, 2022 or latest available



1. Broadband includes fixed and mobile connections with an advertised download rate of at least 256 Kbit/s. E-purchases and e-sales refer to the purchase and sales of goods or services conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders. Cloud computing refers to ICT services over the Internet to access server, storage, network components and software applications. Radio frequency identification (RFID) is a technology that enables contactless transmission of information via radio waves.
Source: OECD, ICT Access and Usage by Businesses Database.

StatLink https://stat.link/i7mtxn

Figure 1.26. Key recommendations on the digital transformation



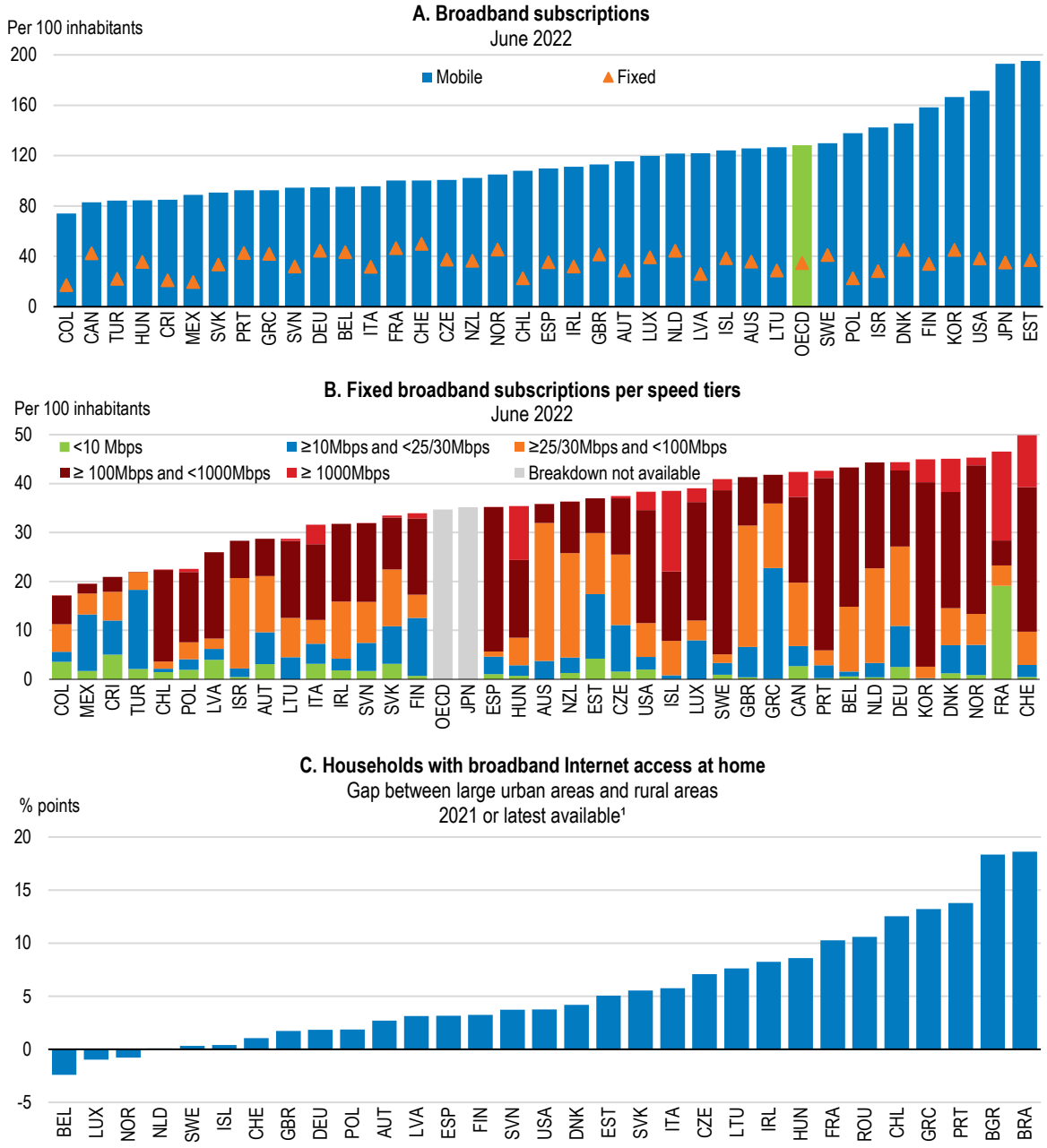
Note: Shares of policy areas based on the recommendations identified in the country notes.

Lifting regulatory barriers to increase technology access

Reliable connectivity is essential for the digital transformation and facilitates interactions among people, firms, and organisations. Fixed broadband penetration, the starting block for connectivity, is still lagging in some countries, and gaps are even more pronounced by speed tiers (Figure 1.27, Panels A and B). The deployment of high-speed fixed networks is not only important to increase fixed broadband penetration, but also for the newer generation of mobile networks. Expanding quality broadband to rural and remote areas remains also a key challenge, as differences in coverage between urban and rural areas are large (Figure 1.27, Panel C).

Improving the existing legal, regulatory and governance frameworks that incentivise investment in highspeed broadband networks is key for the digital transformation. For instance, the rolling-out of 5G technology, which can act as a 'leapfrog' technology and is often heralded as necessary to accelerate and deepen the digital transformation (OECD, 2021e), will necessitate significant investment in infrastructure, through more fibre deployment and new last mile connectivity solutions to make sure people have potential access to faster, better-quality network. Entry barriers remain high in several countries (Figure 1.28) and lowering them would ease both fixed and mobile networks deployment, as well as increase the access and use of services at competitive prices.

Figure 1.27. Disparities in connectivity remain large across countries

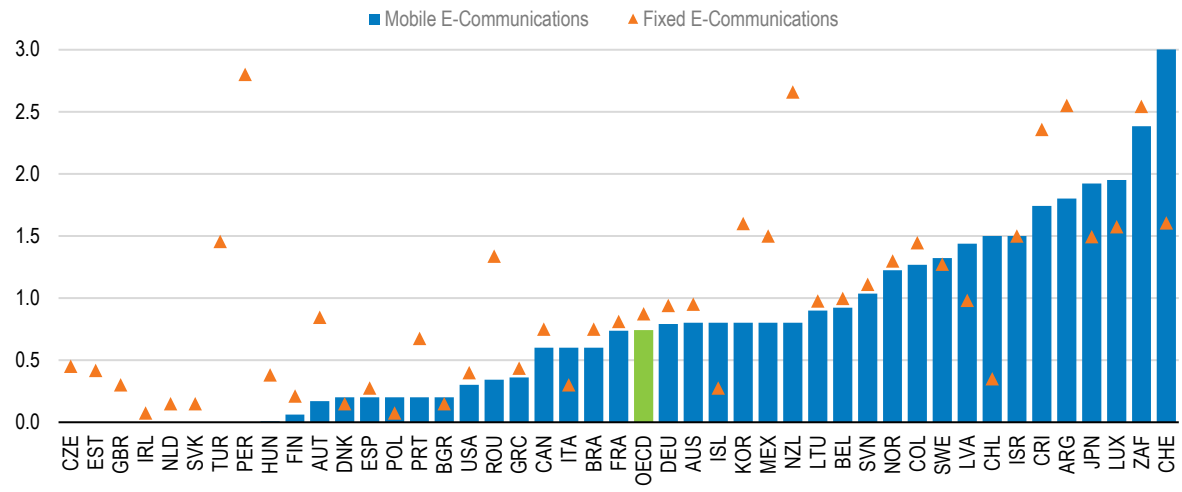


1. The last available year is 2019 for the United Kingdom and 2017 for Chile.
Source: Panels A and B: OECD, Broadband Portal, www.oecd.org/sti/broadband/oecdbroadbandportal.htm; Panel C: OECD, ICT Access and Usage by Households and Individuals Database.

StatLi https://stat.link/mi4brj

Figure 1.28. Regulatory barriers on communications could be eased further

Index from 0-6 from least to most restrictive, 2018



Source: OECD, Product Market Regulation 2018 Database.

StatLink https://stat.link/p02mi8

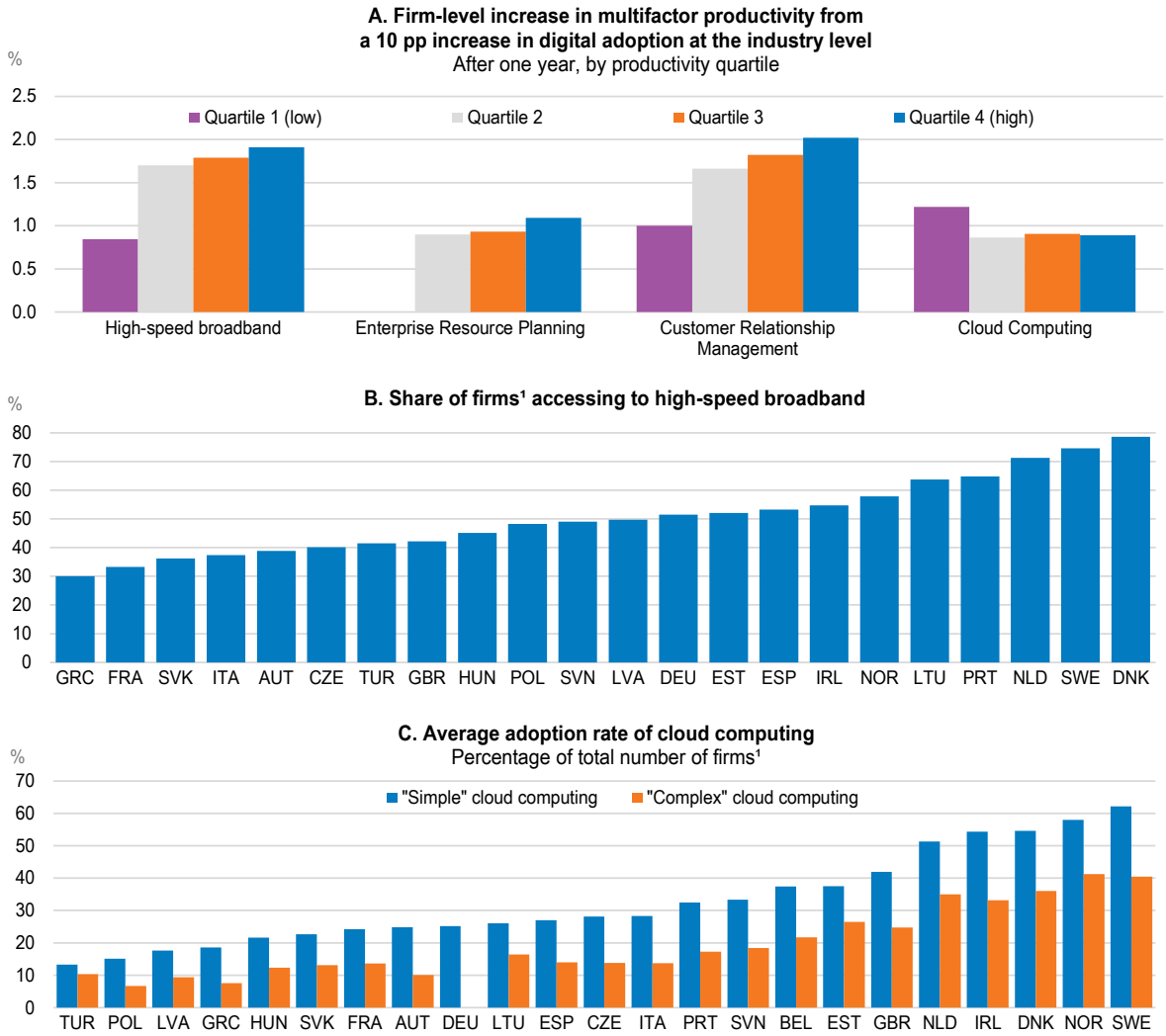
Achieving the productivity potential of digital adoption

Digital technologies offer new tools to design, producing and market goods and services, and to interact with other firms, workers, consumers and governments. Technologies, such as cloud computing, software to automate supplier and customer relations, online platforms and artificial intelligence, offer a vast potential to boost productivity and living standards. However, this potential is likely to differ across firms, posing challenges for policy. Indeed, OECD analysis shows that the productivity performance of the top performing firms has exceeded that of most other firms, holding back overall productivity growth (Andrews et al., 2016). Adoption of digital technologies has been a key driver of this divergence in performance, which is more pronounced in digital-intensive industries (Sorbe et al., 2019). There is therefore ample room to boost aggregate productivity through the adoption and diffusion of digital technologies (Figure 1.29).

In addition to promoting the availability of the necessary pre-requisite infrastructures, policies can focus on appropriate incentives, including by ensuring a competitive business environment, and on building capabilities, such as by encouraging the accumulation of digital and managerial skills. The “incentives and capabilities” policies also exhibit strong complementarities for advancing adoption (Andrews et al., 2018), requiring thus an articulated and complementary policy strategy, with market incentives reinforcing the positive effects of enhancements in firm capabilities on adoption of digital technologies.

Lowering burdens on the entry of new firms, identified as recommendations in several countries, is likely to spur incentives for adoption, as young firms possess a comparative advantage in commercializing new technologies, thus placing indirect pressure on incumbent firms to adopt them. Technological catch-up is particularly difficult in some sectors, such as services, where pro-competitive product market reforms have been least extensive, and lowering impediments to competition could promote adoption (Andrews et al., 2016).

Figure 1.29. Further adoption of digital tools could result in large productivity gains across firms



1. Firms with at least 10 employees. 2017 or latest year available.

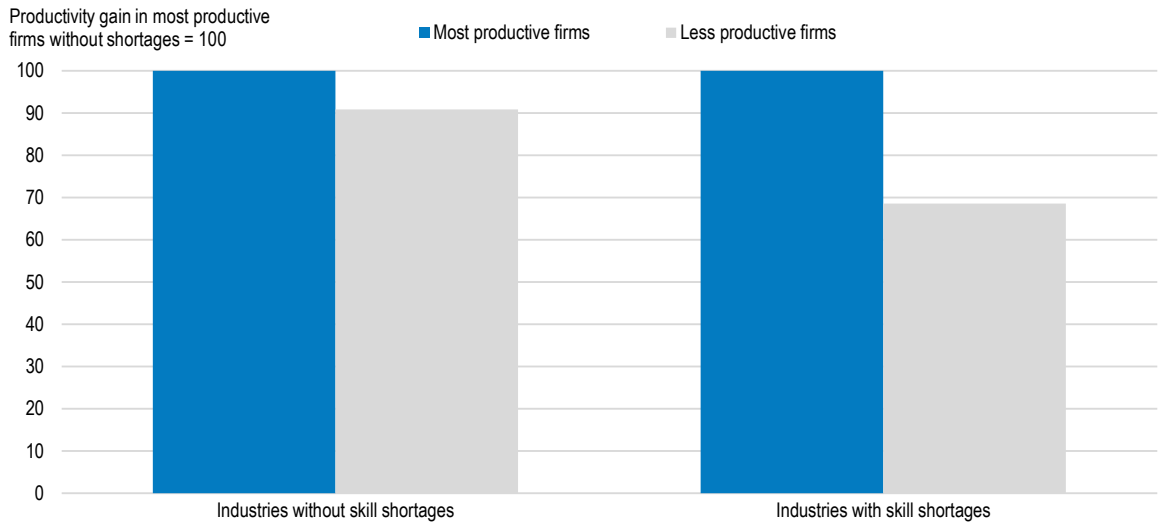
Source: Sorbe, S., et al. (2019), "Digital Dividend: Policies to Harness the Productivity Potential of Digital Technologies", OECD Economic Policy Papers, No. 26, OECD Publishing, Paris, https://doi.org/10.1787/273176bc-en.

Moreover, policies that facilitate the movement and redeployment of labour and capital, within and across firms, could promote digital diffusion. For example, finding the right balance between overly restrictive labour codes, where hiring and firing costs are high, and those which may reduce incentives for firms to invest in firm-related human capital, is essential for adapting to technological change. Similarly, too stringent and burdensome insolvency regimes that could slow the reallocation of capital, or housing policies that impede residential mobility and the movement of labour, could influence the speed of digital adoption. Recommendations in those areas have been identified in several countries. Addressing them could also contribute to the adaptation of economies for other objectives such as climate mitigation, given that this challenge carries some similarities with digital adoption in terms of the disruptions entailed, requiring also to increase reallocation capacities.

Regarding capabilities, accelerating the acquisition of digital skills across all segments of the population is key for widespread digital adoption. The well-recognized strength of Estonia in digital technologies, and its reputation as a front-runner in digital government, can be partly traced back to the massive accumulation of computer science and information technology skills implemented shortly after the restoration of

independence (OECD, 2022b). To make effective the adoption and use of digital tools within firms (and organizations), human capital plays a critical role, and increasing digital skills is a key recommendation identified in several countries (Figure 1.26). The skills needed essentially consist of specialized competencies from ICT professionals, and generic digital skills for other workers, for a broad-based use of digital technologies. Evidence shows that skill shortages in all these two areas can be a brake to reaping the benefits of digitalization, especially undermining productivity gains in less productive firms (Figure 1.30).

Figure 1.30. Skill shortages reduce gains from digitalisation in less productive firms[1]

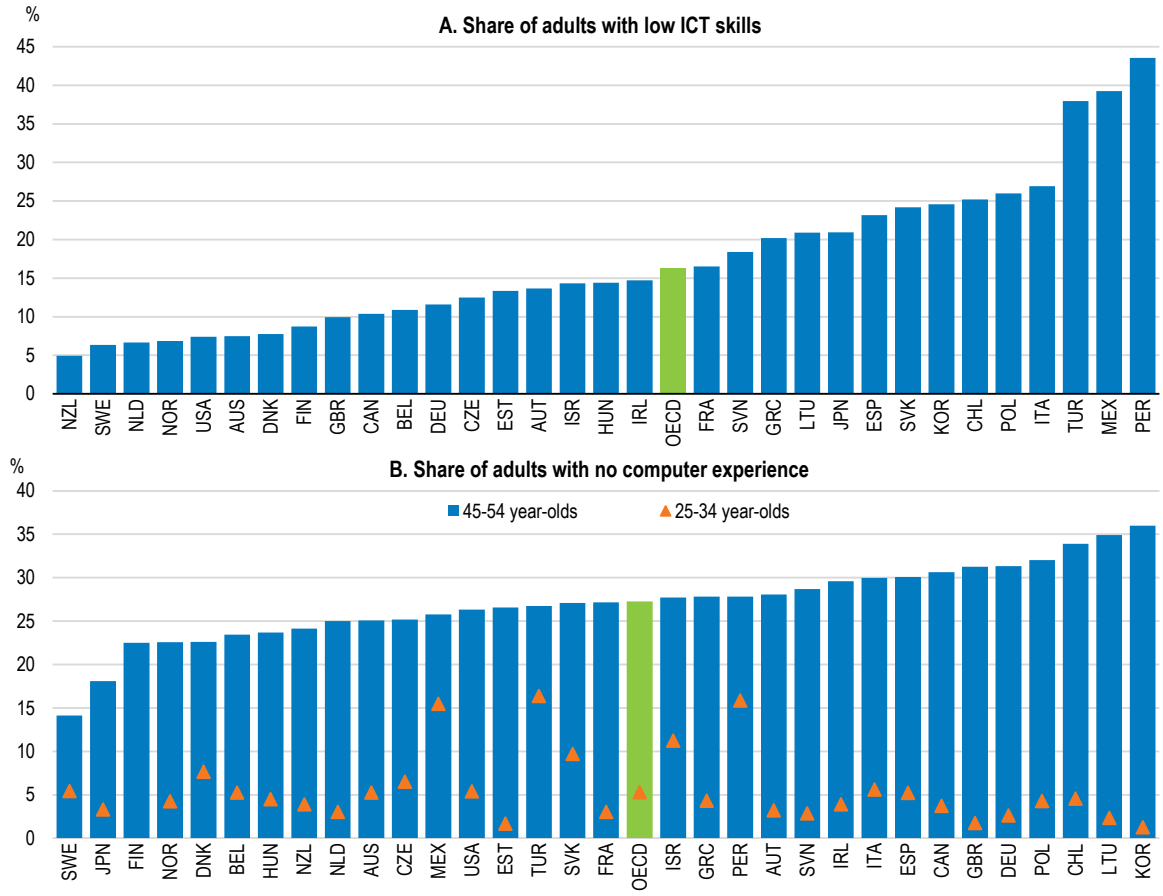


1. Estimated effect on multi-factor productivity (MFP) of digital adoption of a mix of selected technologies (high-speed broadband, cloud computing, ERP and CRM software) for two categories of firms. “Most productive firms” are the 25% most productive firms in each industry (after exclusion of the 5% most productive ones). “Less productive firms” are those between the 50th and the 75th percentile of the productivity distribution in each industry (i.e. firms with below-median productivity but not the least productive ones). The situation without skill shortages is defined as the 25th percentile of the distribution of skill shortages across industries in a range of areas including both managerial and technical skills (source: OECD Skills for Jobs database). The situation with skill shortages corresponds to the 75th percentile of this distribution.
Source: Sorbe, S., et al. (2019), "Digital Dividend: Policies to Harness the Productivity Potential of Digital Technologies", OECD Economic Policy Papers, No. 26, OECD Publishing, Paris, https://doi.org/10.1787/273176bc-en.

Seizing the benefits of digital change depends first on the availability of ICT specialists, whose expertise is crucial to identify and deploy efficiently new technologies. Indeed, these skills enable innovation in a digital economy to flourish, but also support the infrastructure on which firms, governments and users rely. Given the rapid pace of digital transformation, it is thus important to implement forward-looking programmes to match current ICT training programs with expected skills needs in various sectors. Involving the private sector, to align and predict its needs, is key for the relevance of such programs. However, digital diffusion will stall if adoption is not broad-based, which will depend crucially on the generic digital skills on non-specialist. Across countries, many adults still lack ICT skills, in particular the older generations (Figure 1.31).

Figure 1.31. Generic digital skills could be improved

2018



Source: OECD (2019), Skills Matter Additional results from the survey of Adult skills.

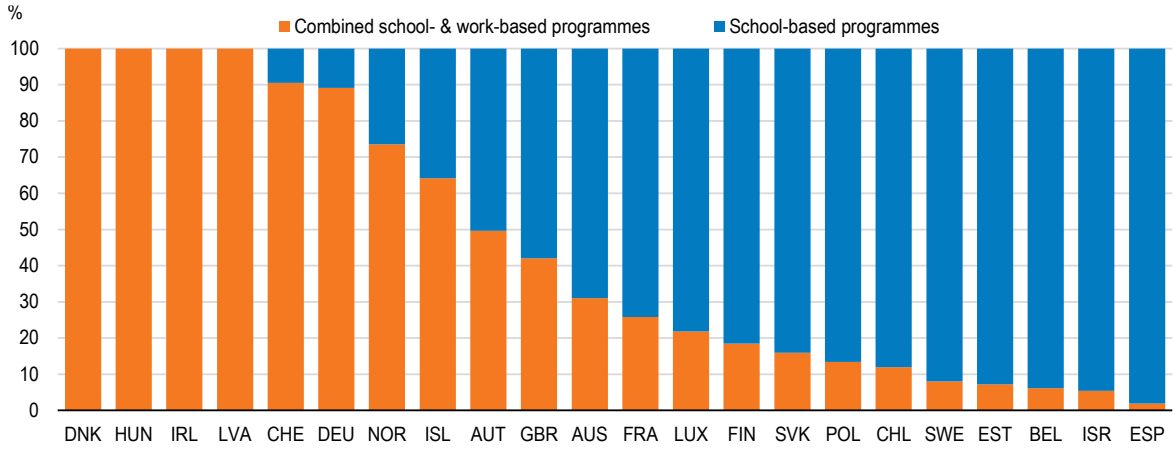
StatLink https://stat.link/sk83rw

Lifelong learning has a central role to play in allowing workers and job seekers to keep up with the digital transformation. Emphasis should be placed on providing support to firms and their different stakeholders, e.g., owners, managers and workers, to ensure they can adapt continuously their skills to the fast evolution of technology and job market needs. Achieving so requires stepping-up investments in training, by providing individuals with opportunities to gain or improve their digital skills, ensuring that skills are matched with jobs within firms, and developing and maintaining high quality management (Sorbe et al., 2019).

Attention should also be given to enhancing the digital curriculum proposed to students in the educational system. In particular, expanding vocational education and apprenticeships is a recommendation identified in several countries. Access should also be facilitated and encouraged, to ensure that individuals gain digital skills matching the evolution of labour market needs. Evidence points to the fact that, compared with post-graduate studies, vocational education facilitates school-to-work transition, and tends to lead to a faster accumulation of digital skills (Grundke, R. et al., 2018). Currently, several countries are still struggling to attract students in combined school and work-based programmes (Figure 1.32).

Figure 1.32. The importance of work-based learning is varying across countries

Share of VET students in combined school- and work-based programmes for upper secondary education, 2020



Source: OECD, Education and Training Database.

StatLink https://stat.link/ngavqj

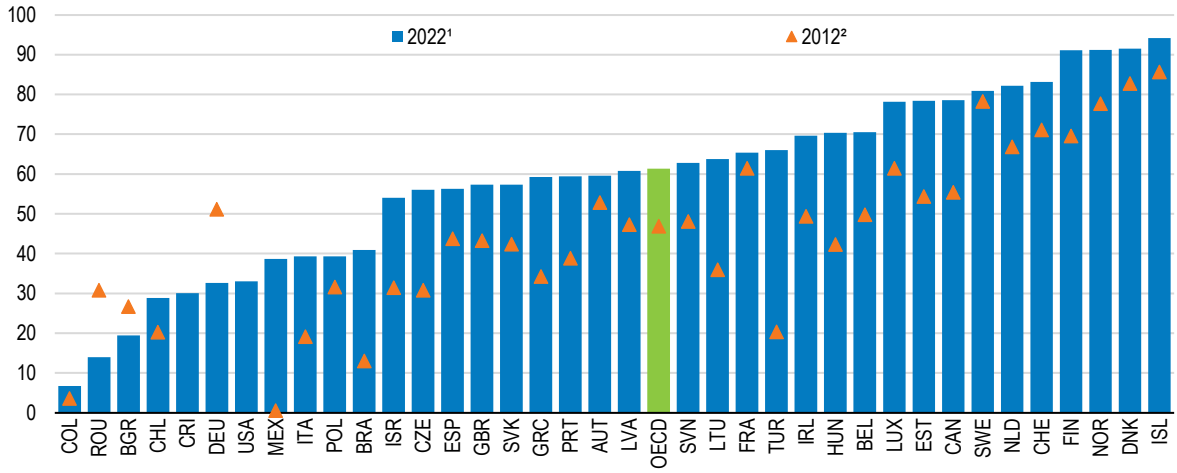
Leading the way with digital government

Governments must continue to provide the leadership in using data and technology to maximise the potential of the digital transformation. Digital technologies can have a substantial impact on government's capacity to effectively design and implement policies, and to be transparent and accountable in delivering outcomes and outputs. The COVID-19 pandemic has demonstrated the capacities and scope for improvement in the use of digital technology to continue delivering public services in most countries.

Policies can promote wider uptake of digital government services. Performance in this area varies considerably across countries, but it has increased significantly, even during the decade prior to the pandemic (Figure 1.33). Cross-country variations mainly reflect differences in various factors such as fixed broadband penetration, internet usage rates, the availability of digital government services and the propensity of users to perform administrative procedures online (OECD, 2021e). The simplification and elimination of unnecessary procedures, the greater interoperability of State institutions in requesting information, as well as the complete digitalisation of their internal processes, are steps that could offer opportunities to increase the quality of, and access to, digital public services. As for the whole economy, promoting digital skills in the public sector is also crucial, and their developments should be encouraged across all categories of civil servants. Similarly to private companies, the public sector needs to improve generic digital skills, and attract digital specialists and also proactive managers (OECD, 2021e).

Figure 1.33. The uptake of digital government services remains low in some countries

Percentage of individuals using the Internet for visiting or interacting with public authorities websites during the last twelve months



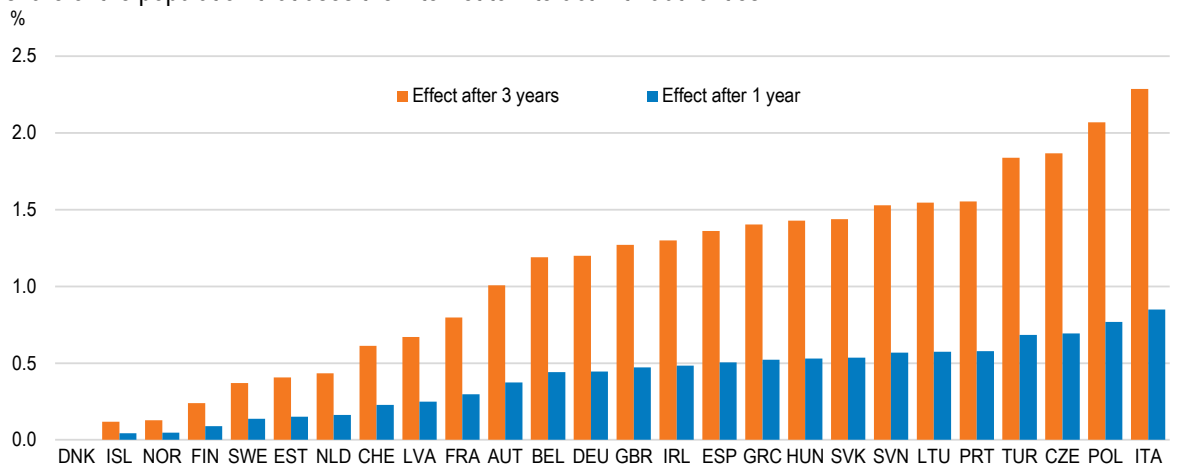
1. The last available year is 2017 for Chile; 2018 for Costa Rica; 2020 for Canada, Israel and the United Kingdom; 2021 for Brazil, Colombia, Iceland, Mexico, Switzerland and the United States.
2. Data refer to 2014 for Chile and Switzerland.
Source: OECD, ICT Access and Usage by Households and Individuals Database.

StatLink https://stat.link/0gjohf

Beyond efficiency gains for the public sector and increased values for individuals, shifting towards a more digitalised government can also trigger benefits for the economy at large, by fostering the development of digital skills among the population, as well as encouraging firms to adopt digital technologies to enable interaction with public authorities. In return, productivity gains could materialize relatively quickly for firms (Figure 1.34).

Figure 1.34. Illustrative productivity gains for firms from an increase in digital government use

Estimated effect on multi-factor productivity of the average firm from increasing e-government use, as measured by the share of the population that uses the internet to interact with authorities[1]



1. It is assumed that half of the gap to the country having the highest prevalence of e-government in the sample (Denmark) is closed.
Source: Sorbe, S., et al. (2019), "Digital Dividend: Policies to Harness the Productivity Potential of Digital Technologies", OECD Economic Policy Papers, No. 26, OECD Publishing, Paris, https://doi.org/10.1787/273176bc-en.

StatLink https://stat.link/fexd0o

Bibliography

Andrews, D., G. Nicoletti and C. Timiliotis (2018), “Digital technology diffusion: A matter of capabilities, incentives, or both?”, OECD Economics Department Working Papers, No. 1476, OECD Publishing, Paris, https://dx.doi.org/10.1787/7c542c16-en

Andrews, D. C. Criscuolo and P. Gal (2016), “The Best versus the Rest: The Global Productivity Slowdown, Divergence across Firms and the Role of Public Policy”, OECD Productivity Working Papers, No. 5, https://doi.org/10.1787/63629cc9-en

Andrews, D. and C. Criscuolo (2013), "Knowledge-Based Capital, Innovation and Resource Allocation", OECD Economics Department Working Papers, No. 1046, OECD Publishing, Paris, https://doi.org/10.1787/5k46bj546kzs-en

Bambalaite, I., G. Nicoletti and C. Von Rueden (2020), “Occupational entry regulations and their effects on productivity in services: Firm-level evidence”, Vol. OECD Economics Department Working Papers/1605, https://doi.org/10.1787/c8b88d8b-en

Berestycki, C., et al. (2022), "Measuring and assessing the effects of climate policy uncertainty", OECD Economics Department Working Papers, No. 1724, OECD Publishing, Paris, https://doi.org/10.1787/34483d83-en

Calvino, F., C. Criscuolo and R. Verlhac (2020), "Declining business dynamism: Structural and policy determinants", OECD Science, Technology and Industry Policy Papers, No. 94, OECD Publishing, Paris, https://doi.org/10.1787/77b92072-en

Criscuolo, C., P. Gal, T. Leidecker, and G. Nicoletti (2021), "The human side of productivity: Uncovering the role of skills and diversity for firm productivity", OECD Productivity Working Papers, No. 29, OECD Publishing, Paris, https://doi.org/10.1787/5f391ba9-en

D’Arcangelo, F., et al. (2022a), "Estimating the CO2 emission and revenue effects of carbon pricing: New evidence from a large cross-country dataset", OECD Economics Department Working Papers, No. 1732, OECD Publishing, Paris, https://doi.org/10.1787/39aa16d4-en

D’Arcangelo, F., I. Levin, A. Pagani, M. Pisu, and A. Johansson (2022b), "A framework to decarbonise the economy", OECD Economic Policy Papers, No. 31, OECD Publishing, Paris, https://doi.org/10.1787/4e4d973d-en

Dechezleprêtre, A., et al. (2022), "Fighting climate change: International attitudes toward climate policies", OECD Economics Department Working Papers, No. 1714, OECD Publishing, Paris, https://doi.org/10.1787/3406f29a-en

Dechezleprêtre, A., D. Nachtigall and B. Stadler (2020), "The effect of energy prices and environmental policy stringency on manufacturing employment in OECD countries: Sector- and firm-level evidence", OECD Economics Department Working Papers, No. 1625, OECD Publishing, Paris, https://doi.org/10.1787/899eb13f-en

Dechezleprêtre, A., N. Rivers and B. Stadler (2019), "The economic cost of air pollution: Evidence from Europe", OECD Economics Department Working Papers, No. 1584, OECD Publishing, Paris, https://doi.org/10.1787/56119490-en

De Loecker Jan, Jan Eeckhout, Gabriel Unger, The Rise of Market Power and the Macroeconomic Implications, The Quarterly Journal of Economics, Volume 135, Issue 2, May 2020, Pages 561–644, https://doi.org/10.1093/qje/qjz041

Grosh, M. (2022), “Revisiting Targeting in Social Assistance: A New Look at Old Dilemmas”, World Bank Publishing, Washington D.C., https://doi.org/doi:10.1596/978-1-1814-1

Grundke, R. et al. (2018), “Which skills for the digital era? Returns to skills analysis”, OECD Science, Technology and Industry Working Papers, No. 2018/09, OECD Publishing, Paris, https://dx.doi.org/10.1787/9a9479b5-en

IEA (2022), World Energy Outlook 2022, International Energy Agency Publications, Paris, https://www.iea.org/reports/world-energy-outlook-2022

IEA (2021), Net Zero by 2050, IEA, https://iea.blob.core.windows.net/assets/deebef5d-0c34-4539-9d0c-10b13d840027/NetZeroby2050-ARoadmapfortheGlobalEnergySector_CORR.pdf

IMF (2022), International Monetary Fund World Economic Outlook: War Sets Back the Global Recovery, Washington, DC, April.

Khan, M. (2020), “Paid family leave and children health outcomes in OECD countries”, Children and Youth Services Review, Vol. 116, 105259, https://doi.org/10.1016/j.childyouth.2020.105250

Metcalf, G., and J. Stock (2020), "Measuring the Macroeconomic Impact of Carbon Taxes," AEA Papers and Proceedings, 110: 101-06, https://doi.org/10.1257/pandp.20201081

OECD (2023a), Aiming better: government support for households and firms facing the energy crisis, OECD Publishing, Paris, forthcoming.

OECD (2022a), OECD Employment Outlook 2022, OECD Publishing Paris, https://doi.org/10.1787/1bb305a6-en

OECD (2022b), OECD Economic Surveys: Estonia 2022, OECD Publishing, Paris, https://doi.org/10.1787/21ef46e4-en

OECD (2021a), Main Findings from the 2020 Risks that Matter Survey, OECD Publishing, Paris, https://doi.org/10.1787/b9e85cf5-en

OECD (2021b), Effective Carbon Rates 2021: Pricing Carbon Emissions through Taxes and Emissions Trading, OECD Publishing, Paris, https://dx.doi.org/10.1787/0e8e24f5-en

OECD (2021c), Brick by Brick: Building Better Housing Policies, OECD Publishing, Paris, https://doi.org/10.1787/b453b043-en

OECD (2021d), OECD Economic Surveys: France 2021, OECD Publishing, Paris, https://dx.doi.org/10.1787/289a0a17-en

OECD (2021e), OECD Digital Economy Outlook 2020, OECD Publishing, Paris, https://doi.org/10.1787/bb167041-en

OECD (2020a), Is Childcare Affordable?, Policy Brief on Employment, Labour and Social Affairs, OECD Publishing, Paris, https://www.oecd.org/els/family/OECD-Is-Childcare-Affordable.pdf

OECD (2020b), Green Infrastructure in the Decade for Delivery: Assessing Institutional Investment, Green Finance and Investment, OECD Publishing, Paris, https://dx.doi.org/10.1787/f51f9256-en

OECD (2019), OECD Employment Outlook 2019: The Future of Work, OECD Publishing, Paris, https://doi.org/10.1787/9ee00155-en

OECD (2018a), A Broken Social Elevator? How to Promote Social Mobility, OECD Publishing, Paris, https://doi.org/10.1787/9789264301085-en

Sorbe, S., P. Gal, G. Nicoletti, and C. Timiliotis (2019), “Digital Dividend: Policies to Harness the Potential of Digital Technologies”, OECD Economic Policy Papers, No. 26, OECD, https://doi.org/10.1787/273176bc-en

Annex 1.A. The OECD Going for Growth framework for prioritisation of structural reforms

Going for Growth uses quantitative and qualitative insights to identify structural reform recommendations to boost medium-term economic growth in an inclusive and sustainable way. Limited to 31 OECD members in its 2005 edition, *Going for Growth*'s coverage has grown over time to include 49 economies by 2023, including many non-OECD economies.

Building on a production-function decomposition of GDP per capita, *Going for Growth* has for long focussed on reforms to improve labour productivity and labour utilisation. In its 2017 edition, however, its framework was extended to include an inclusiveness dimension. Reducing inequalities of income and opportunities, as well as poverty, is indeed necessary to safeguard social cohesion and the well-being of citizens, which are key to sustain growth in the longer run. On the other hand, growth and well-being are increasingly threatened by environmental pressures like – among others – air pollution and climate change. This acknowledgement led, in the 2019 edition, to the explicit inclusion of environmental sustainability as an additional dimension in the framework to identify economy-specific policy recommendations. Moreover, for this edition, the digital transformation is recognized as a cross-cutting dimension that has the potential of not only boosting growth, but that can also support inclusiveness and sustainability objectives (Figure 1.A.1).

The identification of reform recommendations for each individual economy builds on a mixed approach combining a quantitative and a qualitative assessment. The starting point of the process, however, consists in the detailed examination of dashboards of indicators including, for each of the *Going for Growth* dimensions (i.e., growth, inclusiveness and environmental sustainability), the best available outcome and policy indicators matched into pairs based on the surveillance of economic evidence. Put differently, along each dimension, every single indicator of economic outcomes is matched with the indicators of policies empirically proven to address them. The pairings, hence, occur based on the links between outcome and policy indicators established in the academic literature and applied research by the OECD and other institutions. The current *Going for Growth* framework includes more than 450 of these links.

For each of these outcome-policy pairs, economies are then benchmarked against the OECD average by standardising both outcome and policy indicators to have the mean across economies equal to zero and standard deviation of one. In this context, an outcome-policy pair becomes a recommendations candidate in a given economy if falling into the lower-left quadrant of Figure 1.A.2, i.e., when both the outcome and the associated policy score below the OECD average.

In the following step, OECD expert judgement is used to select the top recommendations faced by each economy and regrouped in four areas in the country notes (product and labour markets functioning; digital transition; inclusiveness, social protection, and ageing; and climate transition). This step also considers potential recommendations which have not been included in the matching process due to improper measurement or limited comparability. Reliance on expert judgement allows overcoming limitations of data quality and coverage and ensures the framework's comprehensiveness. A final step is peer-review, dialogue and consultation process with the governments before the final publication.

Periodic comprehensive reviews of policy and outcome indicators ensure the selection framework remains up-to-date with the frontier of academic and applied research, as new data and evidence become available on key policy issues.

Figure 1.A.1. Going for Growth framework

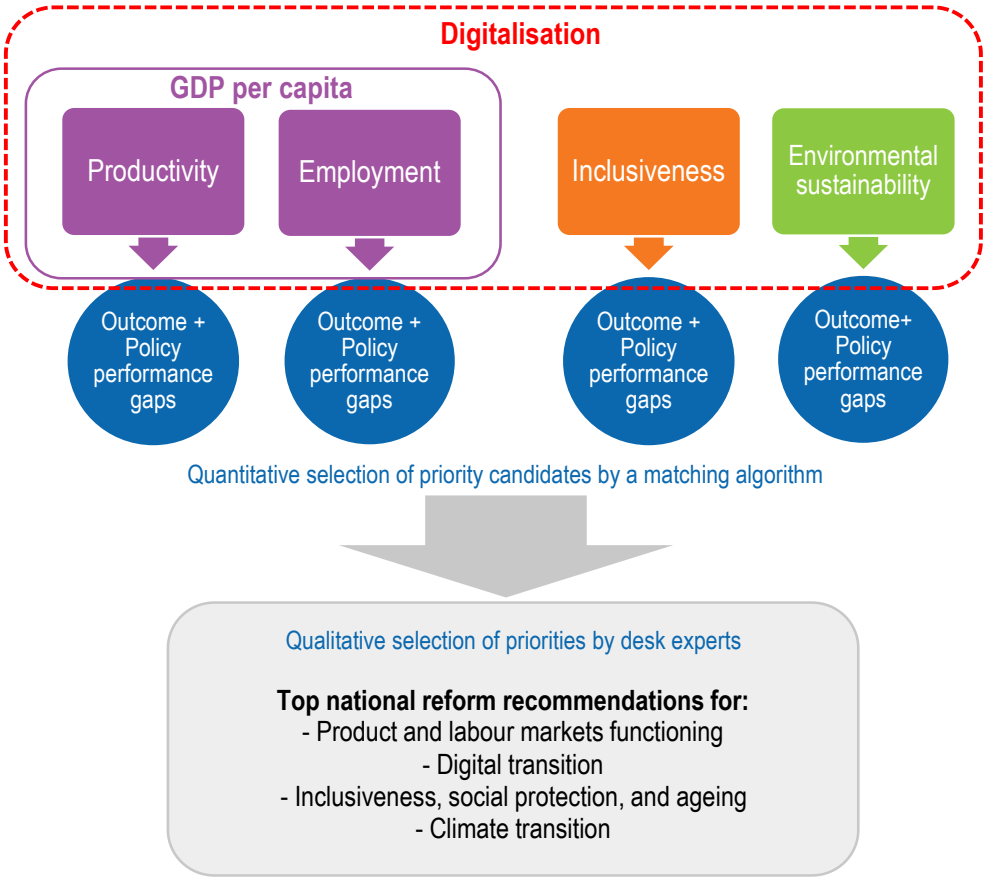
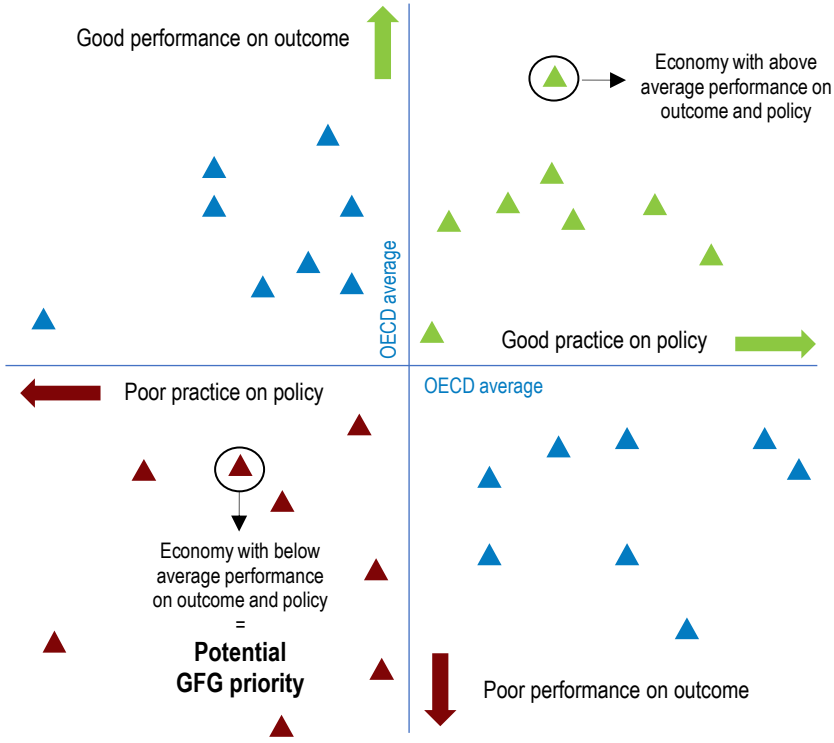


Figure 1.A.2. Identification of the candidates for reform recommendations



2 Risks and opportunities of reshaping global value chains

The chapter reviews selected implications of trade integration via global value chains (GVC) and identifies gaps in understanding of GVC risks. Despite recent significant progress, many GVC risks remain unknown. The chapter also discusses pros and cons of possible strategies to minimise GVC risks and specific measures that are debated in the literature. None of the proposed strategies is a silver bullet and best measures are likely to vary across products and sectors. Most actions to improve resilience lie with firms rather than governments. There is less controversy about governments taking a more proactive role in co-ordinating data collection, analysing GVC risks and collaborating with private firms to promote standards of conduct. In contrast, there is less agreement about governments using financial incentives, regulatory requirements and direct government control to reshape GVCs. Government intervention risks creating costly distortions without minimising economic volatility and improving national security, and making international co-operation.

Introduction and the main takeaways

Growing trade and capital integration in the 1990s and the 2000s have profoundly affected the performance and structure of the global economy. Globalisation enabled increasing specialisation, concentration of production and trade in intermediate inputs. These brought many benefits in terms of higher productivity, lower prices, greater variety of goods and accelerated income convergence of many emerging-market economies (EMEs). However, some global value chains (GVCs) have become intricate and prone to disruptions that spread across sectors and economies. The COVID-19 crisis and Russia's war against Ukraine have acutely renewed awareness of these risks, even if international trade and GVCs proved to be beneficial in many instances.

Globalisation is facing political headwinds. Factory closures and growing income inequality have contributed to eroding social support for globalisation in advanced economies for more than a decade. National security and strategic autonomy considerations have gained traction, risking a more fragmented economic and political order. In many OECD countries, the supply of some critical goods has become heavily dependent on imports, raising geopolitical risks. All these factors have led to increased calls on governments to wield economic measures (trade, investment and industrial policies) to limit dependency on some foreign economies.

Against this background, this chapter reviews selected characteristics of trade integration via GVCs and their implications and identifies gaps in our understanding of risks related to GVCs, building on extensive OECD analyses and the academic literature. The focus is on foreign dependencies, including the so-called strategic dependencies, geographical and firm concentration of production, weak points in supply chains and shock propagation. The chapter then outlines possible general strategies to address GVC risks identified in the rapidly emerging literature. Subsequently, the chapter discusses specific measures that private firms and governments could take, stressing their pros and cons. To keep the chapter concise, many other aspects of globalisation, including capital flows, migration, and knowledge spillovers, are not analysed here even if they interact with trade integration and policies aimed at addressing GVC risks. The main takeaways of the chapter are summarised in Box 2.1.

Box 2.1. Main takeaways

- Increased trade integration and the emergence of global value chains (GVCs) have contributed to higher productivity, lower prices, greater variety of goods, and accelerated income convergence of many emerging-market economies.
- At the same time, dependency on imports, including for pharmaceuticals, products underpinning green and digital transitions and energy, and on exports increased but to a varying degree across OECD countries and sectors. The production of some products has become highly concentrated in specialised firms and countries. GVCs have become longer and more complex.
- These features ensure efficiency gains and facilitate diversification of supply and demand. However, they may create potential for single points of failure (choke points) and for propagation and amplification of micro shocks. They may also raise geopolitical risks.
- Theoretical links between trade integration and economic volatility are not clear-cut, and related empirical evidence is mixed. Even if trade were to increase volatility, it is not obvious that such volatility is unequivocally bad and should be limited. According to some simulations, the quantitative effects of higher volatility are not guaranteed and are small in relation to efficiency gains.

- Understanding of GVC risks has improved, but many unknowns remain. Exposures at product and firm levels are less well researched. Many GVC indicators based on input-output data do not account explicitly for substitutability across suppliers, complementarity of inputs to production, international transport, and foreign dependencies of investment and technologies.
- The potential for reducing GVC risks without eroding efficiency gains vary across products and sectors. So do possible strategies and specific measures. Diversifying, bringing production home or to closer (friendlier) locations (the so-called re-shoring and near-(friend)-shoring), and optimising stockpiling are the three most frequently discussed strategies.
- Diversifying is generally superior to re-shoring in ensuring resilience and robustness of supply chains. Near-shoring can reduce delays of long supply chains and import fees. Friend-shoring can facilitate greater regulatory alignment, involve smaller risks to intellectual property and help to minimise geopolitical risks. However, defining “friends” based on clear and lasting criteria without adding to business uncertainty is challenging.
- Reshaping supply chains can be costly, but diversification could be less expensive than re/near-shoring. It is generally cheaper and easier to diversify production of goods that require simple technologies, are characterised by small economies of scale and are standardised. Diversifying and re-shoring may be unviable or difficult in sectors with high fixed costs and for many natural resources.
- Adjusting inventories could boost GVC robustness for some goods and for some shocks, but it is not a panacea for all GVC risks. It can also be costly. The viability of this solution is going to vary not only across sectors but also across products and firms within a given sector.
- Most actions to improve resilience lie with firms rather than governments. Private firms have financial incentives to reduce risks of costly disruptions to production, though they could be muted by costs of adapting supply chains and by the sunk costs of past investment. Private firms seem also to be best placed to choose between minimising exposures to risks (robustness) and improving the ability to resume operations after a negative shock (resilience).
- The fundamental questions about the case for and the nature of public involvement in reducing GVC risks remain unsettled. Public intervention can be in principle justified when public and private interests are misaligned, and when private firms underestimate risks due to the lack of information.
- Governments could take a more proactive role in co-ordinating collection of data and analysing GVC risks. They could also collaborate with private firms to promote standards of conduct to increase robustness and resilience. The benefits would be higher if such efforts are co-ordinated internationally. Governments may also conduct stress tests for essential supply chains, but feasibility and design of such test remain challenging.
- Governments can in principle support risk-reducing strategies with a combination of financial incentives, regulatory requirements and direct government control. These measures vary in effectiveness, side effects. They should be tailored to specific industries and products, given considerable heterogeneity across sectors and firms. The complexity of modern supply chains makes a comprehensive evaluation of government policies aimed at minimising GVC risks and the ensuing distortions difficult.
- The main concern about distortions of policies aimed at reducing foreign exposures relates to efficiency effects as they can impose significant welfare losses.

- Threats to national security in principle justify insuring against negative geopolitical events or acting to prevent such events. However, geopolitical risks and associated economic costs are difficult to evaluate. Besides, some policy measures may prove ineffective in ensuring security. To minimise risks that such policies will be ineffective and costly for taxpayers and consumers, objective and thorough evaluations are needed.
- So far, most of GVC-risk-reducing government policies have focused on re/near/friend-shoring, with fewer measures aimed at diversification and inventory management. Scant empirical evidence on the effectiveness of the government measures to encourage re-shoring and friend-shoring is mixed.
- Protectionist policies could hinder achievement of global social and environmental objectives. Inward-oriented policies could also reduce knowledge spillovers, with negative consequences for technological progress and productivity growth. Tit-for-tat protectionist policies could magnify welfare losses from the less integrated world economy.

Trade globalisation: Trends and implications

After a rapid expansion, trade globalisation has ceased to advance

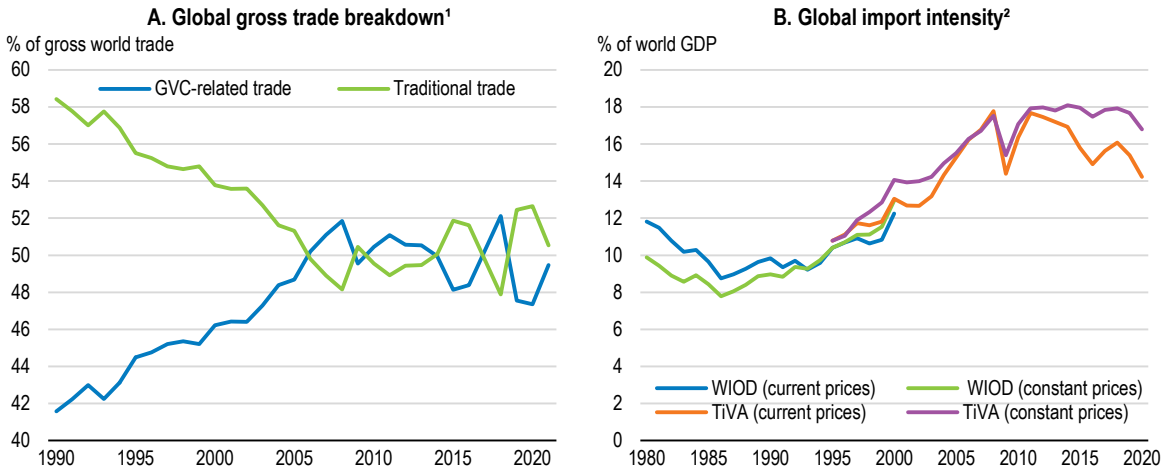
Since the mid-1980s, global trade has increasingly moved from the exchange of finished goods between countries to breaking up of stages of production across borders. This process changed the nature of specialisation from one focussed on discrete products to one focussed on the production of individual components and processes as part of wider global production chains. In this model of global trade, materials and components cross national borders many times as they move through stages of the production chain (Cheng et al., 2015). Consequently, trade in intermediate products became increasingly important for world trade in the 1990s (Figure 2.1, Panel A).

Since the global financial crisis, there has been some signs of slowing or retreating trade globalisation, at least as far as measured by flows of gross exports and imports. However, trade in goods and services remain an important share of global production (Jaax, Miroudot and van Lieshout, 2023). The fall in the ratio of goods trade to GDP is largely driven (until more recently) by declines in the relative price of heavily traded goods, such as fuel and mining commodities, and by the declining importance of manufacturing as a component of GDP (Baldwin (2022); Figure 2.1, Panel B). Still, an actual decrease in fragmentation has also contributed (Jaax, Miroudot and van Lieshout, 2023). However, world trade flows have remained high, trade in services has continued to grow, and GVC activity is still close to the level of the mid-2000s (Antràs, 2020).

The shift to fragmented global production chains observed from the mid-1980s was driven by three factors (OECD, 2013; Antràs, 2020). First, falls in tariffs and improvements in the cost and reliability of transport across borders meant that multiple production sites imposed less of a burden on manufacturers. Second, new information and communications technologies (ICT) allowed the effective management and co-ordination of geographically dispersed production sites. Third, the spread of the global market system gave firms access to large and cheap workforces and growing numbers of customers. Off-shoring not only lowered the marginal cost of production but also encouraged higher output to better amortise the fixed costs associated with moving production overseas.

One of the key trends to emerge from the last three decades has been the increasing importance of China in GVCs. A large supply of low-cost labour and a regulatory environment conducive to trade resulted in significant inflows of FDI to China, which has contributed to the development of China-centric GVCs (Xing, 2022).

Figure 2.1. Global trade integration remains high



1. Traditional trade considers exports of goods and services that are produced in one country and absorbed in the destination country. Therefore, only one frontier is crossed. GVC trade comprises exports of goods and services that are produced in more than one country and have crossed more than one border, at least. The time series are spliced from World Bank Integrated Trade Solution (WITS) Eora and Asian Development Bank Multi-Regional Input-Output data.
2. The Long-run World Input Output Database 1965 – 2000 (WIOD) and OECD Trade in Value Added (TiVA) are measures of global trade and value chains. Import intensity is a measure of the ratio of imports to total production.
Source: World Bank WITS Eora; ADB MRIO data; OECD Inter-Country Input-Output database; Long Run World Input Output database; OECD calculations.

StatLink https://stat.link/8raw1c

Trade globalisation has brought many benefits but involved hardships for some

Trade integration and the emergence of GVCs have brought many benefits to consumers and firms. The development of the multilateral trading system has drastically lowered the price of consumer and intermediate goods and increased the range and quantity of available goods. These benefits are felt also among lower-income households who spend a larger proportion of their income on standardised consumer items (Fajgelbaum and Khandelwal, 2016; Jaravel and Sager, 2019). Trade is also associated with higher productivity through channels such as technology transfer and knowledge diffusion and access to a wider variety of inputs (Égert, 2017). Access to larger markets has helped high-productivity firms to increase their output and employment. Participation in GVCs has allowed firms and workers, often from EMEs, to specialise in the stages of production at which they are most competitive, without having to master all the technology needed to produce complex modern products and without requiring the domestic development of supply chains which may not be globally competitive (OECD, 2017).

The fragmentation of production has also facilitated the integration of many EMEs into the global economy, helping to achieve a rapid technological catch-up and significant reduction in global poverty. Increases in trade volumes in developing economies have been associated with high economic growth, relative to advanced economies and developing economies that did not benefit from global trade and participation into manufacturing stages of value chains (Dollar and Kraay, 2004). Leveraging the steps of the production chain where EMEs have a comparative advantage has improved the living standards of workers in these countries. Growth in GVC exports of EMEs is associated with increases in key macroeconomic variables such as GDP per capita, investment and productivity (Mitra, 2020). GVCs have had direct positive impacts on jobs and wages in EMEs and, through spillover effects, in the global economy. They have also increased demand for skilled workers in these countries (WTO, 2019).

Trade integration has been disruptive to many industries and local communities in advanced economies, contributing to anti-globalisation sentiment (Rodrik, 1998; Antràs, 2020; Rodrik, 2021). Growing trade and capital mobility in the 1990s and the 2000s enabled substitutability of labour provided by large segments of advanced economies' population with labour of people in EMEs. This has contributed to a reduction in labour bargaining power, partly due to the segmentation of the workforce, and in manufacturing employment (Durand and Milberg, 2019).[1] Consequently, many workers have experienced instability in earnings and precarity, and real growth in median earnings has been sluggish (Acemoglu and Autor, 2011). These effects have been stronger in the United States than in Europe. This is partly explained by less generous social protection in the United States than in Europe. On the other hand, large income gains have been realised by shareholders of companies that benefited from globalisation.

The exact contribution of international trade and off-shoring to rising income inequality is still being debated. Some researchers find that trade played only a small role in rising wage inequality within countries, with technological progress favouring highly-skilled workers and changes in corporate and public policies being more important causes (Helpman, 2018; Heimberger, 2020).

Generally lower labour and environmental standards in EMEs than in advanced economies have led to perceptions of unfair competition and to underestimation of the total social costs of off-shoring. According to some estimates, environmental externalities of production in off-shore locations are considerable, particularly in heavy industries (Wiedmann and Lenzen, 2018; Felbermayr and Peterson, 2020). Independent from domestic standards, long-distance international transport increases the cost of environmental externalities. Moreover, some cases of breaches of basic labour rights add to social externalities of globalisation (European Union, 2021).

Selected characteristics of global value chains and their implications

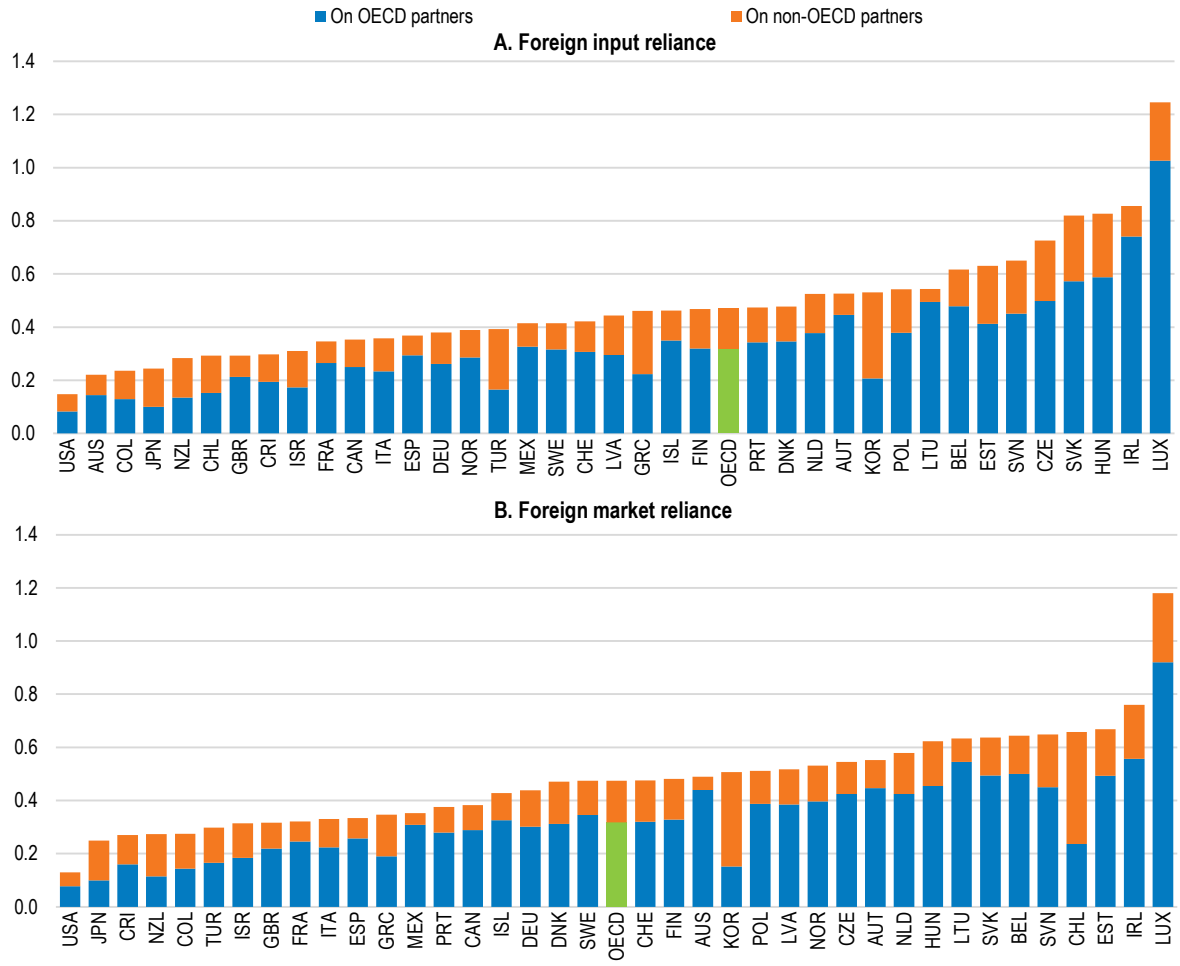
Increased trade integration and specialisation have boosted productivity and lowered prices. The flip side of these processes is that: dependency on imports, including for products underpinning green and digital transitions, and dependency on foreign demand increased; the production of some products has become highly concentrated in specialised firms and countries; and GVCs have become longer and more complex. These features have given rise to potential single points of failure (choke points) but also improved resilience in some cases. A low diversity of suppliers or buyers can increase the risk of disruption and can magnify the propagation of shocks given few alternatives to buying from or selling to other firms or countries (Arriola et al., 2020; Schwellnus et al., 2023).

Import and export dependencies

Various measures of foreign exposures exist. Each has advantages and disadvantages (Borin, Mancini and Taglioni, 2021; Baldwin, Freeman and Theodorakopoulos, 2022). Measures based on gross trade, in contrast to trade in value added, that account for both direct and roundabout trade via third countries are preferred for assessing exposures to supply shocks. For instance, foreign input reliance (FIR), measuring dependencies on suppliers (upstream), and foreign market reliance (FMR), measuring dependencies on buyers (downstream), capture risks to GVCs stemming both from the size of exposures and the complexity of the value chain (Schwellnus et al., 2023).

[1] For instance, in the United States, trade integration with China is assessed to be a salient factor behind the decline in US manufacturing employment in the 1990s and 2000s (Autor, Dorn and Hanson, 2013; Pierce and Schott, 2016).

Figure 2.2. Foreign dependencies vary across OECD countries



Note: Foreign import reliance (FIR) can be understood as the share of a country's output that is exposed to disruptions to overseas supply chains. It is computed as the ratio of foreign inputs used in domestic industry to domestic gross output. Foreign market reliance (FMR) measures the share of a country's output that is used overseas, and it is computed as the ratio of domestic output used in foreign production to domestic gross output.

Source: Schwellnus et al. (2023), "Global Value Chain Dependencies under the Magnifying Glass", OECD Science, Technology and Industry Policy Papers, No. 142, OECD Publishing, Paris.

StatLink https://stat.link/29tq4m

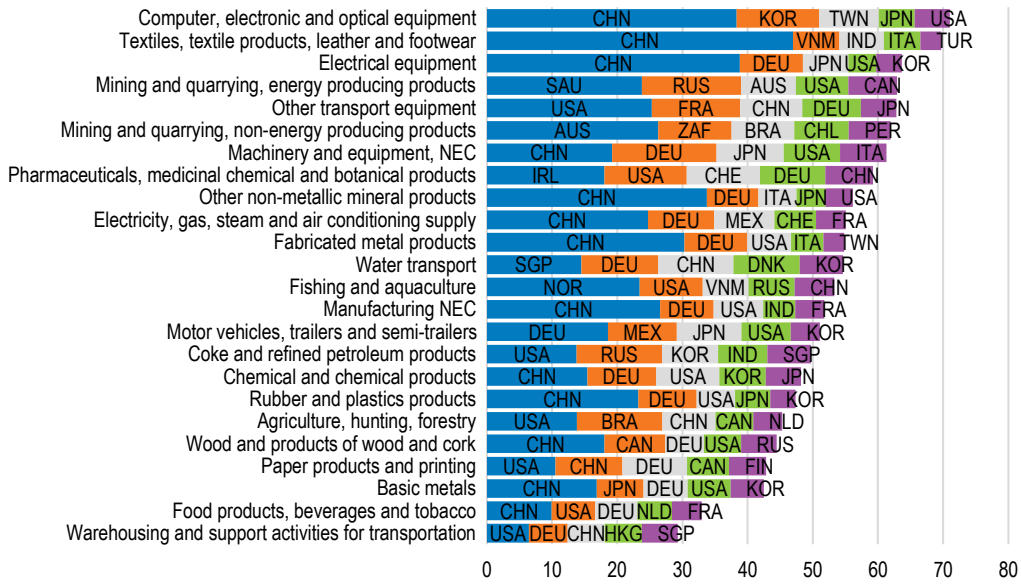
The analysis of the FMR and FIR indicators highlights key features of foreign dependencies (Figure 2.2, Schwellnus et al. (2023)). Not surprisingly, small open economies tend to be more exposed to foreign suppliers and buyers. Downstream dependencies in several cases arise from specialisation in mining of natural resources (Norway, Chile and Australia). For most OECD countries, exposures are largely within the OECD block, especially within regional hubs: the Americas, Europe and Asia. However, some Asian and South American countries depend crucially on China. Moreover, dependencies vary significantly across sectors. Motor vehicles, other transport, textile and apparel, ICT and electronics and machinery are particularly dependent on foreign inputs, and mining, warehousing and chemicals being particularly exposed to foreign demand.

Country concentration of production and exports

Production of several sectors and products is highly concentrated in very few countries. The share of the top five countries in global gross output is the highest in mining, machinery, textile and apparel, electrical equipment, ICT and electronics, basic metals and fishing industries (Schwellnus et al., 2023). These concentrations are positively correlated with the size of economies, with China and the United States dominating the ranking. The country concentration of intermediate goods exports in mostly manufacturing sectors is smaller than for gross output but still high in some sectors (Figure 2.3). The ranking of countries is more diversified geographically, even if China and the United States still top the ranking in most of the analysed sectors.

Figure 2.3. The geographic concentration of intermediate goods exports is high in some sectors

A share of top-five countries in world exports of intermediate goods by industry, 2018



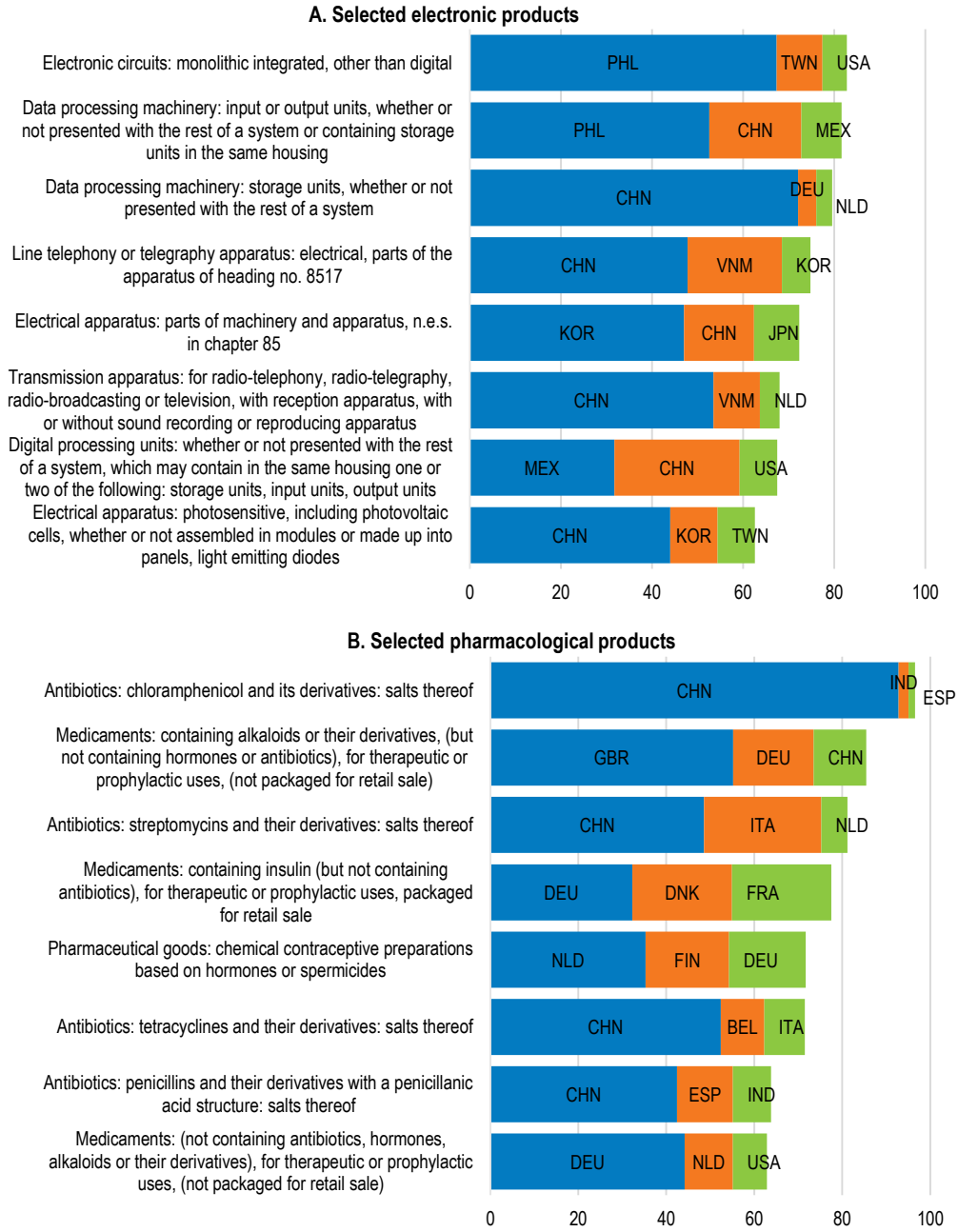
Note: Excluding exports of the rest of the world in the Inter-Country Input-Output (ICIO) database. NEC stands for not elsewhere classified.
Source: Inter-Country Input-Output (ICIO) database; and OECD calculations.

StatLink https://stat.link/mx7h56

The geographic concentration can be even higher at a product level. For example, for many electronic products (including electronic circuits, data processing machinery and parts of telephone equipment) three-quarters of world inputs is provided by two countries, with China, Korea, the Philippines and Vietnam leading the ranking (Figure 2.4, Panel A; Arriola et al. (2020)). Production is also highly concentrated for many pharmaceuticals, especially for components of antibiotics, with China and several European countries being the main producers (Figure 2.4, Panel B).

Figure 2.4. The geographic concentration of production is also very high for individual products

Percent of global production



Source: OECD calculations based on the 2020 BACI (Base pour l'analyse du Commerce International) database; and and Arriola et al. (2020), "Efficiency and risks in global value chains in the context of COVID-19", OECD Economics Department Working Papers, No. 1637, OECD Publishing, Paris.

StatLink https://stat.link/6gl1qv

Strategic dependencies

One aspect of dependencies relates to imported products that are of strategic importance to a nation (Bonneau and Nakaa, 2020; European Commission, 2021; The White House, 2022). There is significant ambiguity in the definition of strategic dependencies in international law. In practice, various reports usually

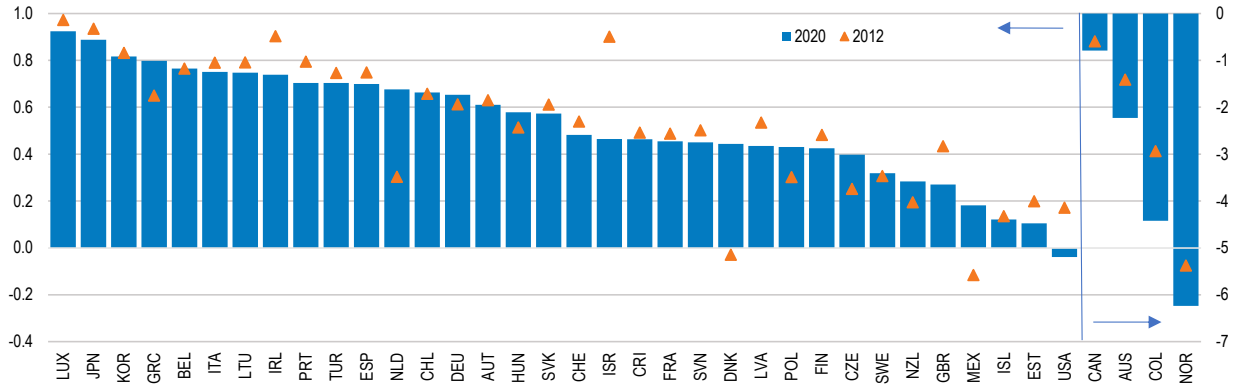
identify strategic sectors as related to security and safety, healthcare, energy, and goods, services and technologies that are key for digital and green transitions.[2]

The European Commission (2021) has identified 137 strategic products for which the European Union depends significantly on imports from third countries, mainly from China but also from Vietnam and Brazil.[3] These products relate to raw/processed materials and chemicals that are energy-intensive; active pharmaceutical ingredients and other health-related products; and several essential products for digital and green transitions. Imports of around one-quarter of these products are particularly vulnerable given low potential for further diversification and substitution with domestic production (the latter due to large price differences). In the United States, strategic dependencies on China are similar to the ones in the European Union. They mainly relate to several products in healthcare, selected raw materials, and key products for green and digital transitions (European Commission, 2021; The White House, 2022).

The semiconductor industry has gained strategic importance given its vulnerability due to high geographical concentration (Haramboure, Lalanne and Schwellnus, 2023). Semiconductors are critical inputs into a range of industries, including ICT goods, electronics and motor vehicles (with their value added accounting for up to 8% of final demand) and military equipment. Their shortages during the COVID-19 crisis have demonstrated the potential to disrupt production in other sectors. The top-five semiconductor-producing economies account for around three-quarters of global value added. Currently, their production is dominated by China, Korea and Chinese Taipei; they account for around 60% of global semiconductor value added.

Energy is a critical sector, and the volatility of supply can affect its costs severely, with important implications for household life quality and firm competitiveness. Many OECD countries are highly dependent on foreign energy sources, especially in Europe and East Asia (Figure 2.5). Furthermore, energy sources are relatively unfungible in the short term, such as powerplants and vehicle fleets, use specific fuels. This can exacerbate the dependency of national energy systems. Import dependencies are particularly high for crude oil and natural gas. For instance, while the overall energy import dependence rate of the European Union was 58% in 2020, its import dependency rate for natural gas was 88%.

Figure 2.5. Energy import dependence is high in many OECD countries



Note: The figure shows the energy import dependency rate which is calculated as the ratio of net imports (imports minus exports) to gross inland energy consumption (production plus net imports). Energy includes coal, oil, natural gas and electricity.
Source: IEA Extended World Energy Balances Database and OECD calculations.

StatLink https://stat.link/fs7k46

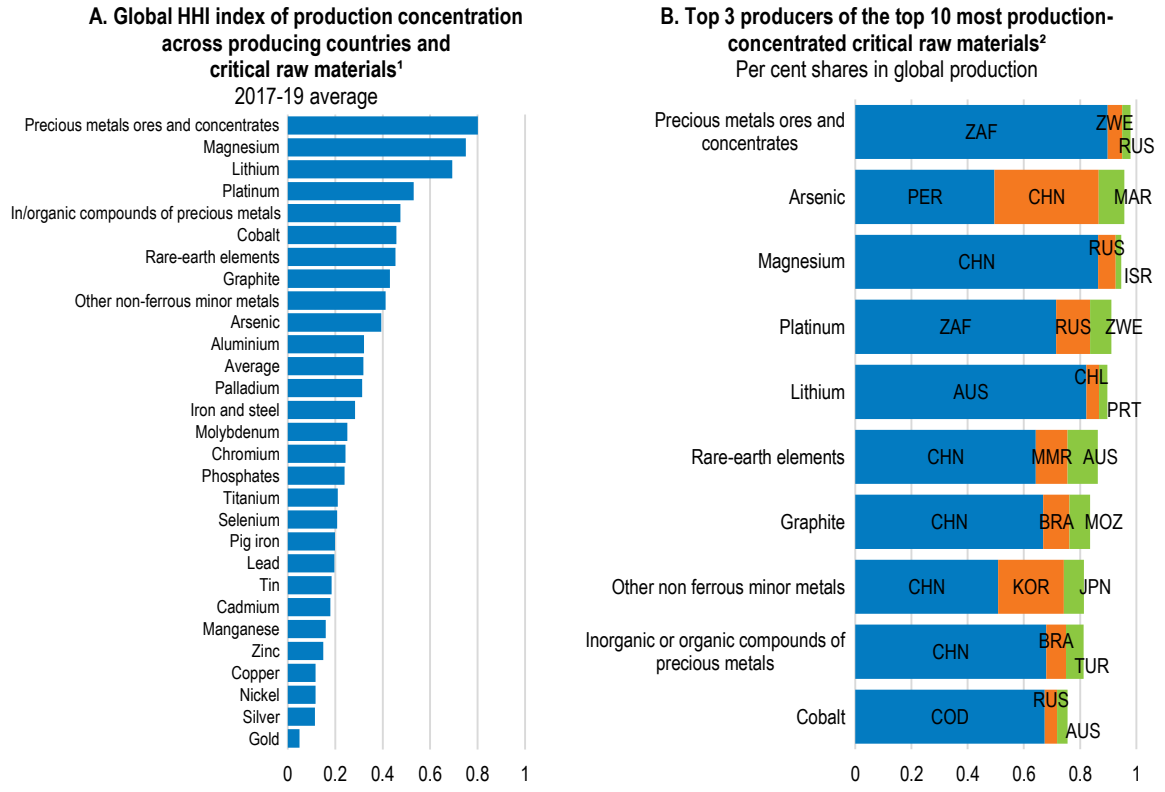
[2] The selection of strategic sectors can relate to definitions for screening of foreign direct investment, lists of critical raw materials as well as defense and space industries (OECD, 2020).

[3] The quantification part of the identification of strategic products is based on measures of concentration of EU imports from non-EU sources; importance of extra-EU imports in total EU imports; and a proxy of the substitutability of extra EU imports with EU production (approximated with EU exports) – European Commission (2021).

In the last decade, production of critical raw materials has become increasingly concentrated amongst few countries (Kowalski and Legendre, 2023), frequently categorised as politically unstable or extremely unstable (Federal Ministry of Agriculture Regions and Tourism, 2022).[4] Moreover, some of leading countries account for large shares of production of more than one critical raw material (Figure 2.6). China is among top three producers of six out of ten most production-concentrated critical raw materials. The processing of critical minerals is high and typically more concentrated than extraction (IEA, 2022). However, for some minerals, the current concentration of extraction is higher than the concentration of natural reserves, implying that extraction may become less concentrated in the future.[5]

The high concentration of production is partly explained by geological conditions and high fixed capital costs in mining and quarrying, but industrial policies have played a role too. China's leading position in owning foreign mineral assets and refining capacities are behind its dominance.

Figure 2.6. Concentration of production of critical raw materials is high



1. Concentration of production is measured by the Herfindahl-Hirschman index (HHI).
2. 3-letter country ISO codes for countries that are not in the OECD and are not among the key partners and the accession countries refer to: Democratic Republic of the Congo (COD), Morocco (MAR), Mozambique (MOZ), Myanmar (MMR), Russia (RUS) and Zimbabwe (ZWE).
Source: Kowalski and Legendre (2023), "Raw materials critical for the green transition: Production, international trade and export restrictions", TAD/TC/WP(2022)12/REV1; and OECD calculations based on the United States Geological Survey data.

StatLink https://stat.link/ryxuvh

[4] Including the Democratic Republic of the Congo and African countries in the Great Lakes region.

[5] For instance, Australia, Chile and China account for almost 90% of lithium production, but 73% of identified reserves and only 25% of estimated deposits; China produces almost 80% of graphite but only holds 23% of global reserves (US Geological Survey, 2022; Ritchie, 2023).

Concentration is also high for several products that are central for the green transition. For example, China dominates global production of solar photovoltaic (PV) products and batteries, which are central for achieving the next zero emissions targets (IEA, 2022; IEA, 2022). China's share of global polysilicon, ingot and wafer production (the key stages in the manufacturing process of solar PV) is soon expected to reach 95%. This production is concentrated in a single region and in a few factories, leading to important supply vulnerabilities. China produces three quarters of all lithium-ion batteries and is home to 70% of production capacity for cathodes and 85% for anodes – the two key components of batteries. China's dominance in these products owes to government industrial policies that enabled huge economies of scale and continued innovation in the supply chain.

Centrality and choke points

The structure of networks determines potential GVC vulnerabilities and propensity to amplify shocks. Network analysis helps identify the importance of a country or sector in the GVC network – the so-called centrality – by accounting for the direct participation of countries in GVCs and also for the participation of their value-chain partners (Criscuolo and Timmis, 2018; Cingolani, Iapadre and Tajoli, 2018; Altomonte, Colantone and Bonacorsi, 2018; Arriola et al., 2020). The higher the centrality indicator, the greater the importance of a country/industry as a supplier or customer in the network and the larger potential to propagate shocks.

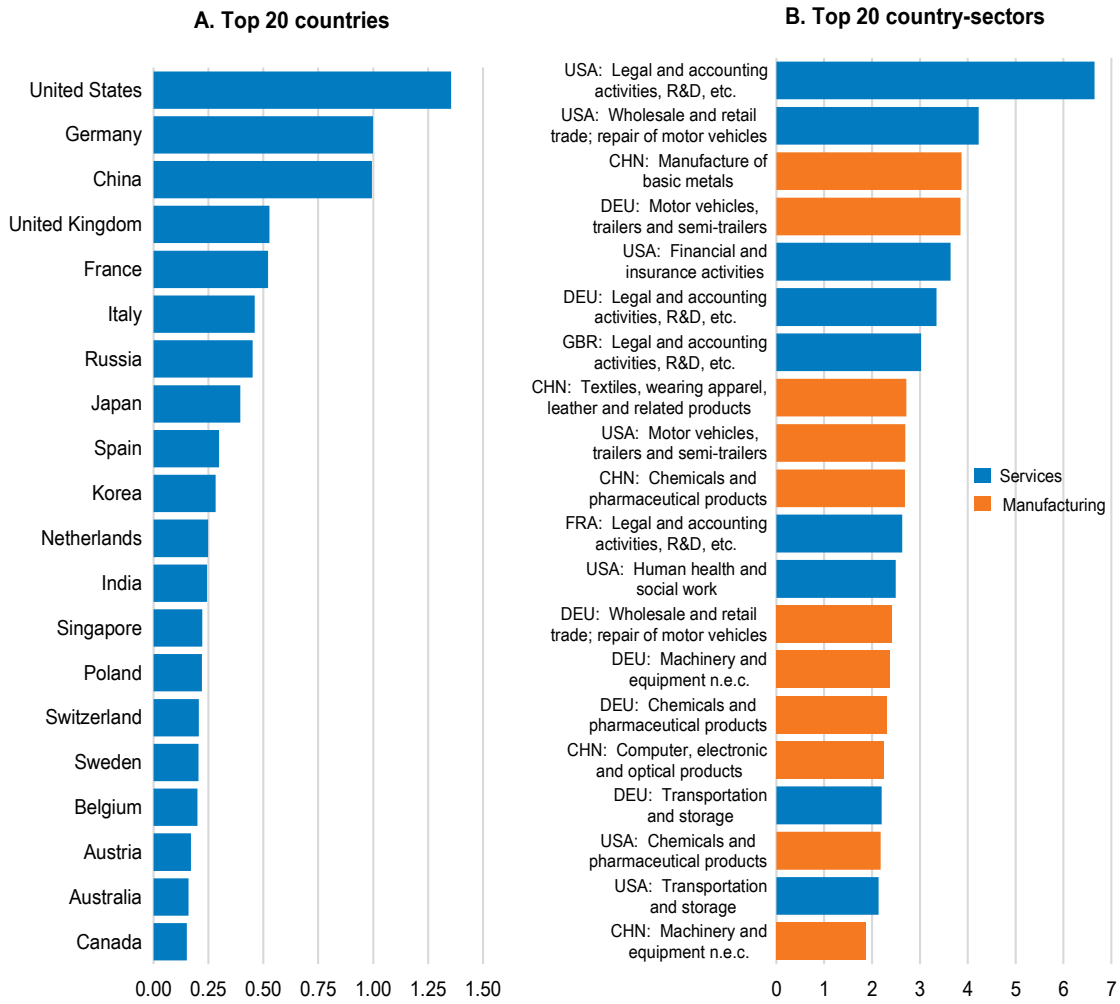
According to some measures, China and G7 countries are the most central countries in GVCs, with China having significantly advanced the ranking since 2005 (Figure 2.7, Panel A).[6] Looking at the sectoral ranking, legal and accounting activities and wholesale and retail trade sectors in the United States are the most central among service sectors, while manufacture of basic metals in China and motor vehicles production in German are the most central among the manufacturing sectors (Figure 2.7, Panel B).

A similar picture is given by measures of upstream choke points (defined as the most important suppliers of intermediate inputs) and downstream choke points (the most important buyers of intermediate inputs) (Schwellnus et al., 2023).[7] Within the manufacturing industries, China scores the highest in several industries both as the key supplier and as the key buyer (ICT and electronics, basic metals, chemicals, machinery, electoral equipment and construction). China is also an important choke point on the buying side for mining of energy products, while Russia, Saudi Arabia and the United States are key on the supplying side. Among the OECD countries, only few manufacturing industries in Germany and the United States are identified as choke points.

[6] Based on gross value-added for intermediate inputs.

[7] These measures are based on the foreign input reliance and foreign market reliance measures discussed above. The upstream choke point measure is similar to the forward centrality measure and the downstream choke point is similar to the backward centrality measure, but the choke point measures weight proximate and distant links equally (Criscuolo and Timmis, 2018; Schwellnus et al., 2023).

Figure 2.7. Centrality differs across countries and sectors



Note: The country centrality measure in Panel A is computed as the average across all sectors' total foreign centrality for each country. Total foreign centrality in Panel B is computed as the average of forward and backward centrality in a given country-sector. Foreign forward centrality captures the importance of a country or a sector as a supplier of value added embedded in foreign countries' exports, while foreign backward centrality measures the importance of a country as a buyer of foreign value added used in its own exports. The manufacturing sector excludes construction while the service sector excludes electricity, gas, water supply services. The "rest of the world" has been excluded from the chart. The centrality measure is a relative measure of Bonacich-Katz eigenvector centrality of countries and country-sectors developed in Criscuolo and Timmis (2018). The larger the measure, the more central is a sector/country.
Source: OECD (2018) Inter-Country Input-Output (ICIO) database; and Arriola et al. (2020), "Efficiency and risks in global value chains in the context of COVID-19", OECD Economics Department Working Papers, No. 1637, OECD Publishing, Paris.

StatLink https://stat.link/jiwbrv

Not all vulnerabilities are known

Despite the wealth of data and analyses on country and sector dependencies and centrality, understanding of vulnerabilities is not complete. Exposures on a product level and complexities of networks at the firm level, and their macroeconomic, systemic and security implications, are less well researched. Such micro analyses could help better understand implications for macro risks and design targeted policy measures.

- Identification of weak points by researchers and governments is difficult because data on supply chains are proprietary to specific businesses (Farrell and Newman, 2022). Even large firms can have challenges with understanding their own complex networks (Baldwin and Freeman, 2022).

Their first-tier suppliers make up only a small fraction of the full value chain (Lund, 2020).[8] Smaller companies could have less complex supply chains but they are more likely than large companies to face resource constraints on effectively monitoring and analysing supply chains and to be reliant on the supply chains of other firms where they do not have access to information.

- Comparable trade statistics on specific or specialised products across a large number of countries are not available, preventing more refined analysis of dependencies (European Commission, 2021). The lack of details is particularly acute for services and complex technologies.

Many evaluations of GVCs exposures and risks based on input-output data (choke points or centrality) usually do not account for important aspects of exposures:

- *Substitutability*. The ease of substituting across suppliers of a given input can affect resilience. For any given exposure to foreign supply of inputs, economic risks are lower (resilience is higher), if foreign products can be easily substituted by alternative suppliers (either from a different country or domestically). As assessment of substitution is challenging, these considerations are usually not part of GVC vulnerability evaluation.
- *Complementarity*. Complementarity of a given input to production also affects resilience. Analyses of shock propagation via GVCs usually assume that a given sector's output is affected by declines in output of intermediate inputs in proportion to this input's share in gross output. However, some inputs can be highly complementary, and no output can be produced without them (OECD, 2022). For instance, the share of energy input in gross output is generally small, but most of the sectors would not be able to deliver any output without electricity or gas. Similarly, a lack of semiconductors would prevent the manufacture of many products.
- *International transport*. Shocks to transportation are separate from the standard analysis of shocks to supply and demand. 80% of trade is carried by sea. Shipping networks are characterised by concentration on a small set of routes; most shipping connections involve a stop in at least one other country; and a few central ports, acting as hubs in the sparse network, handle huge chunks of global seaborne (Heiland et al., 2019). Several recent events demonstrate that transportation shocks can significantly disrupt international trade, though such disruptions are usually short-lived.[9] They are more likely for transport between continents, where cheap alternatives for bulk products are not available. However, also the road transport links can be negatively affected.[10]
- *Investment:* Most analyses of exposures focus on trade in intermediate inputs in relation to gross output or value added. Thus, they fail to account for trade in final investment goods in relation to total investment. Import dependence of investment can be another source of exposures to foreign shocks or policies. For instance, in the semiconductor sector, machines to produce chips are manufactured by few companies.[11] Thus, any disruption in deliveries of such machines could make the expansion of production in the future difficult.

Shock propagation and economic volatility

Theoretical links between trade integration and economic volatility are not clear-cut, and related empirical evidence is mixed. The relationship depends on underlying model assumptions, the nature of a shock, and

[8]For instance, General Motors was reported to have 856 direct (tier-1) suppliers but over 18,000 tier-2 and below suppliers (Lund, 2020).

[9] For instance, during the COVID-19 crisis, sanitary restrictions on crew changes on container ships disturbed ship transport significantly (Heiland and Ulltveit-Moe, 2020). In 2021, a shipping accident blocked the Suez Canal, closing a shipping route used by 13% of global trade for a week (Allianz SE, 2021).

[10] For instance, shortages of lorry drivers and post-Brexit checks at the border delayed deliveries of goods in the United Kingdom in recent years.

[11] A single firm leads production of lithographic machines that place circuits on the wafers (Lund, 2020).

characteristics of economies and networks. Consequently, it is difficult to draw universal policy implications and to formulate policy solutions.

Increased specialisation can raise volatility by reducing the scope for shock absorption by suppliers (Newbery and Stiglitz, 1984). In addition, complex and long value chains in intermediate inputs can propagate firm or regional-specific disruptions to flow of goods and services across numerous firms and industries in various countries (Levine, 2012). Longer value chains imply also that products cross borders multiple times and consequently there are higher chances of transport disruption.

Microeconomic shocks can be amplified to have macroeconomic consequences (Carvalho and Tahbaz-Salehi, 2019).[12] In principle, the nature of such amplification depends on the distribution of firms' size and the structure of the input-output networks; with shocks to large firms that supply many sectors being more likely to affect macroeconomic volatility (Acemoglu et al., 2012). While such effects can arise in a domestic context only, integration in GVCs may have increased specialisation and the heterogeneity across firms in terms of their importance as input suppliers, which is one of the key factors giving a rise in macro volatility from micro shocks.

However, international trade can also facilitate diversification of supply and demand, reducing exposures to domestic shocks. Indeed, a higher diversification of suppliers in production networks minimises the impact of micro shocks on macroeconomy (Carvalho and Tahbaz-Salehi, 2019). In addition, with a global pool of suppliers and fragmented supply chains it may be easier to manage inventories, adapt just a segment of a supply chain, and change a supplier in the presence of a negative shock than with domestic and less specialised production.

Empirical evidence on the role of trade on macroeconomic volatility is mixed (D'Aguanno et al., 2021). Looking at the general link between trade openness and volatility, some studies find that higher trade integration can lead to more volatility (Rodrik, 1998; Easterly, Islam and Stiglitz, 2001; Giovanni and Levchenko, 2009), but others show the opposite (Bejan, 2011; Buch, Döpke and Strotmann, 2021; Cavallo, 2009; Haddad et al., 2013). Papers that explicitly investigate input-output linkages show consistently that diversification of suppliers reduces economic volatility (Caselli et al., 2020; Ardelean, Leon-Ledesma and Puzzello, 2022; Todo, Nakajima and Matous, 2015). In contrast, the role of specialisation is ambiguous; higher specialisation is found to increase volatility in some studies (Caselli et al., 2020; D'Aguanno et al., 2021), but to lower volatility in others (Ardelean, Leon-Ledesma and Puzzello, 2022). Empirical ambiguity about the link between trade integration and volatility can also reflect inherent differences in volatilities among countries and sectors (Caselli et al., 2020).

Even if trade integration were to increase volatility, it is not obvious that such volatility is univocally bad and should be limited (Levine, 2012). The full assessment should also take into account implications for productivity and welfare (see above). The increasing reliance on intermediate inputs facilitated by GVC integration spurs economic growth, leads to denser production networks and reduces all prices (Acemoglu and Azar, 2020). According to some simulations, the quantitative effects of higher volatility are not guaranteed and are small in relation to efficiency gains (Arriola et al., 2020; D'Aguanno et al., 2021).

A related and important issue in assessing the trade-volatility nexus is the distinction between the resilience (i.e. the ability to recover after a negative shock) and robustness of GVCs (i.e. the ability to maintain operations through the duration of the shock and to minimise the likelihood of the shock) (Miroudot, 2020). Shocks to output in specific sectors, even if frequent, could be short-lived and have negligible

[12] Model simulations of are usually done in a framework where firms employ Cobb-Douglas production technologies with constant returns to scale, transforming intermediate inputs and labour into final products. Several experiences of micro shocks having macroeconomic effects are also documented in the literature. For instance, spreading of localised shocks in the aftermath of the 2011 earthquake in Japan indeed reduced overall GDP (Carvalho et al., 2021).

macroeconomic implications in the longer term.[13] In other words, even if some value chains are not robust (are affected by shocks), they could be resilient, implying that their production can be quickly restored after a negative shock. For instance, after the Great East Japan earthquake, firms with extensive networks of suppliers had a quicker recovery, partly thanks to support from trading partners, an easier search for new partners, and agglomeration benefits (Todo, Nakajima and Matous, 2015). Resilience of the GVCs could result from the ability of negatively affected companies to resolve problems themselves or from the relative ease to switch to alternative suppliers.

In contrast, foreign exposures maybe consequential when trade is used as a coercive tool (for instance during a prolonged periods of serious geopolitical conflicts or wars), and when it is difficult and costly to substitute affected imports. The abrupt and large reduction of gas and oil imports from Russia following the Russia's war against Ukraine, and the resulting spillovers to the European economy, illustrate such challenges well (OECD, 2022).

What can be done to reduce GVC risks?

The literature and discussions above demonstrate that despite some risks stemming from GVCs, trade integration has brought many benefits. The need and urgency to reduce these risks without eroding the economic and risk management benefits of GVCs vary across products and sectors. So do strategies and specific measures. In addition, there is no consensus about the extent of public intervention and specific policies. This section discusses possible solutions to reduce GVC risks, specific measures to achieve such goals and the respective roles of the private sector and governments.

Possible general strategies

Global supply disruptions and increasing geopolitical tensions over the past decade have increased calls for reducing vulnerabilities of GVCs and for strengthening strategic autonomy. Three strategies have been most frequently discussed in the literature: diversifying sources of inputs; relocating production closer to home (near-shoring), especially to friendly countries (friend-shoring), or home (re-shoring); and improving stockpiling. Each of these strategies has advantages and disadvantages and the ultimate policy mix should be chosen based on the balance of costs and benefits of the options and how they interact.

Diversifying suppliers is generally preferred over re/near-shoring

Economic arguments mostly support diversification over re-shoring.[14] Re-shoring is sometimes portrayed as a strategy to reduce GDP volatility. However, in most cases, self-sufficiency or domestic production does not imply robustness of value chains (Miroudot, 2020). Moreover, several model simulations considering different re-shoring scenarios show that re-shoring does not guarantee to achieve this goal, in contrast to diversification and can imply significant welfare FRe-shoring is just likely to shift the relative importance of domestic versus foreign shocks. Even in the most GVC integrated economies, domestic links are already more prominent than foreign links, raising the possibility of further concentration risks. Similarly, the management literature suggests that re-shoring and shortening of the supply chains do not necessarily reduce risks (Miroudot, 2020).

Welfare losses and failure to achieve lower output volatility seem to be less of a concern for near-shoring than re-shoring, given smaller exposures to domestic shocks and, possibly, less marked price differences. Near-shoring can be effectively part of the diversification strategy. Moreover, near-shoring can offer several

[13] This has been the experience during the COVID-19 crisis. For instance, output, employment and trade in the US sectors with a large exposure to intermediates imports from China declined significantly more than in other sectors (Meier and Pinto, 2020). However, these contractions were relatively transitory, and became insignificant by July.

[14] Diversification can involve partial re-shoring.

other benefits. Sourcing from neighbouring economies can reduce delays of long supply chains and import fees. Friend-shoring, which could effectively imply near-shoring and which recently gained political appeal,[15] can facilitate greater regulatory alignment, involve smaller risks to intellectual property and help to minimise geopolitical risks (see below).

Nonetheless, friend-shoring may be difficult to operationalise in practice. Firms could face uncertainty which countries will be identified as "friends" in a manner that will be robust over time. The ambiguity about "safe" locations can add to business uncertainty, with negative implications for investment.[16]

Reshaping supply chains can be costly, but diversification could be less expensive than re/near-shoring. Finding alternative suppliers of specific products could imply sourcing from more expensive producers. If diversification implies shifting one's own factories across countries, it will also entail sunk costs of past investment. This will be especially the case for highly capital and knowledge-intensive industries. The exact impact on costs and profits is likely to be firm-specific and is difficult to assess. In principle, total costs would depend on the size of diversification or re-shoring, price differences between suppliers and any associated changes in transport costs.[17] More studies on the price effects of diversification and re/near-shoring, even at an aggregated level, are needed. The sunk cost argument makes a reshaping of supply chains unlikely in the medium to long term without substantial government support (Antràs, 2020; Baldwin and Freeman, 2022; McIvor and Bals, 2021; European Union, 2021).

Friend-shoring can involve additional costs. The impact of world trade dividing between two blocs could be significant, lowering global GDP by between 0.6% to 4.6% in the medium term (Javorcik et al., 2022). Moreover, homogeneity between friendly countries could eliminate many of the gains from comparative advantage and result in welfare loss.

The possibility to diversify and re/near-shore production is likely to differ significantly across products. Diversifying among products that require simple technologies, are characterised by small scale economies and are standardised is likely to be cheaper and easier than among products that are technology-intensive, require large economies of scale and are highly customised (Baldwin and Freeman, 2022). Economies of scale and resource constraints (labour, capital and technologies) could be also more of an obstacle for re/near-shoring rather than diversification, especially for mid-sized and small economies. Domestic economies and "friendly" countries could face limits to their ability to absorb investment imposed by infrastructural and institutional capacities, available labour force with appropriate skills and the technological base of the economy (Every and van Harn, 2022). Still, diversification may not be viable in sectors with high fixed costs because there would not be sufficient scale of production (Antràs, Fort and Tintelnot, 2017). Similarly, diversification can be difficult to achieve, and re/near-shoring be virtually

[15] The idea has come to prominence after a speech by the US Treasury Secretary Janet Yellen, where she identified objectives of friend-shoring as ensuring free but secure trade and preventing countries using their market position to cause economic disruption or exercise geopolitical leverage (Yellen, 2022). It has been subsequently evoked by Canadian and European politicians (Freeland, 2022; von der Leyen, 2022).

[16] For instance, the US CHIPS and Science Act takes a wide view of potential destinations, specifying a number of "countries of concern" (including the People's Republic of China, the Democratic People's Republic of Korea, the Russian Federation, the Islamic Republic of Iran) rather than seeking to explicitly identify countries considered friendly (Box 2.2). This can be contrasted with the narrower approach taken by parts of the Inflation Reduction Act (Box 2.2) which limits subsidies on electric vehicles to vehicles produced in North America built using a certain proportion of raw materials from countries the United States has a free trade agreement with. A broad approach to identify "friends" may initially limit the fragmentation of the world's trading system. However, reciprocal requirements from targeted countries (particularly around technology transfer and global investments) may eventually require countries or firms to align with one of the sides in the geopolitical divide.

[17] For instance, some estimates suggest that the cost of foreign companies' withdrawing from China could amount to a significant but not prohibitive cost of USD 1 trillion over five years (Supply Chain Connect, 2020).

impossible, for many natural resources that are characterised by high geographical concentration, stemming from natural monopolies (see above).

The feasibility of diversification and near-shoring will also depend on transport infrastructure. For instance, many Southeast Asian economies do not have ports as large and as efficient as ports in China, which could hinder shifting production from China to other Asia countries (Shih, 2020). Thus, without investment in transport infrastructure, considerable diversification and near-shoring would imply high transport costs (longer transport time) (Iakovou and White III, 2020).

Optimising inventories can help reduce some supply chain risks

Building redundancy by increasing inventories, especially of critical intermediate inputs and critical final products, has been long recognised as one of the ways to boost robustness of supply chains in some situations (Shih, 2020). Indeed, during the COVID-19 crisis, commentators noted a shift from "just-in-time" inventory management to the so-called "just-in-case" approach, driving warehouse take-up (Salomon, 2022). In mid-2021, a McKinsey survey of global supply-chain leaders showed that most manufacturers implemented actions to improve inventories rather than near-shore in response to the COVID-19 crisis (Alicke (2021); Figure 2.8). For most products, the cost of storage can be low compared with options to near or re-shore. However, for bulk commodities (including oil and gas), building storage capacity can be expensive and can take time.

Still, the viability of such solution is going to vary not only across sectors but also across products and firms within a given sector. For instance, within pharmaceuticals, stockpiling buffer reserves of perennial drugs with stable demand is indeed a viable option. However, this is not an option for drugs that expire quickly or for which future demand is difficult to predict (for instance due to uncertainties about future health crises and thus required drugs and equipment). Furthermore, while stockpiles can mitigate the impact of volatility in specific supply chains, they will be exhausted by severe or prolonged shocks and rely on stakeholders correctly identifying critical materials and components which could disrupt production and the probability and severity of shocks. The experience of countries during the COVID-19 pandemic illustrates the benefits and risks of seeking to manage supply chain disruption through stockpiling. While some countries had significant stocks of personal protective equipment for treating COVID-19 patients, other countries had significant medical stocks that were ill-suited to the needs of staff on COVID-19 wards (Feinmann, 2021). In addition, maintaining sizeable inventories can lead to waste and inefficiencies that may also discourage firms from investing in resilience.

What should be the role for governments?

The fundamental question about the case for and the nature of public involvement in reducing GVC risks remains unsettled. The literature mainly discusses measures at a firm level and not at a country or global level (Baldwin and Freeman, 2022). In principle, private firms have financial incentives to reduce risks of costly disruptions to production. Prolonged delays in delivery of intermediate inputs make production and sales of products difficult which can lead to financial and reputational losses.[18] Moreover, a company's resilience at the time when competitors struggle with resuming production after a negative shock helps it to gain market share and extra profits. However, financial incentives to reduce risks of disruptions are muted by investment needs to adapt supply chains and by the sunk costs of past investment. Private firms are also best placed to decide whether to focus on improving robustness (i.e. minimising exposures to risks) or on improving resilience (i.e. the ability to resume operations after a negative shock). The ideal strategy is likely to differ across sectors and firms (Miroudot, 2020).

Government intervention could be in principle justified on two grounds.

[18] McKinsey Global Institute estimated the expected loss from significant supply change disruptions to be 42% of one year's earnings before interest, taxes, depreciation and amortisation on average over a decade (Lund, 2020).

- First, when there is a misalignment of public and private interests. For instance, if firms do not account appropriately for social costs of disruptions to production, and ensuing unavailability of specific products, they may underinvest in resilience from the social point of view. In this case, public intervention to align private and societal incentives is justified. A special case of this problem is national security, when the unavailability of certain components or finished products may threaten the economic, health or military security of a country (see below). Thus, leaving the decisions on how best to secure the provision of such goods entirely to private companies could be undesirable. In these cases, the challenge for policymakers is to identify exposures and risks, and to come up with proportional measures to mitigate them. However, this can be difficult in practice.
- Second, public intervention could be motivated by a lack of appropriate information that results in underestimation of risks by private firms. This could reflect complexities of supply networks, costs in gathering and analysing data, and co-ordination failures that prevent firms from obtaining a global perspective for a specific product or a market. Government's help could involve measures to tackle externalities from information asymmetry but also initiatives to improve the understanding of risks (see below).

Thus, direct policy interventions in the global trading system may be justified if they are co-ordinated and targeted to address well-identified market failures. However, evidence on the presence of such market failures in the existing academic literature is limited, making the design of welfare-improving policy interventions difficult (D'Aguanno et al., 2021).

Which specific measures facilitate risk-reduction strategies?

Several specific measures can be taken, both by private companies and governments, to achieve the strategies discussed above. This section summarises them briefly.

Private companies have many ways to reduce risks to their supply chains

Supply chain management literature has long identified numerous measures that companies can undertake to reduce risks to their supply chains (Sáenz and Revilla, 2014; Kamalahmadi and Parast, 2016; Sá et al., 2020). They include designing the supply chain by considering the riskiness of locations and particular suppliers but also agility to resolve disruptions. It is also frequently recommended to boost the flexibility of manufacturing processes and to rely on standardised inputs from multiple suppliers. A good practice is to establish redundant production capabilities. In this respect, long-term purchasing commitments are a good way to incentivise capacity building and lowering prices by alternative suppliers (Shih, 2020). Finally, the literature advises optimising stockpiles.

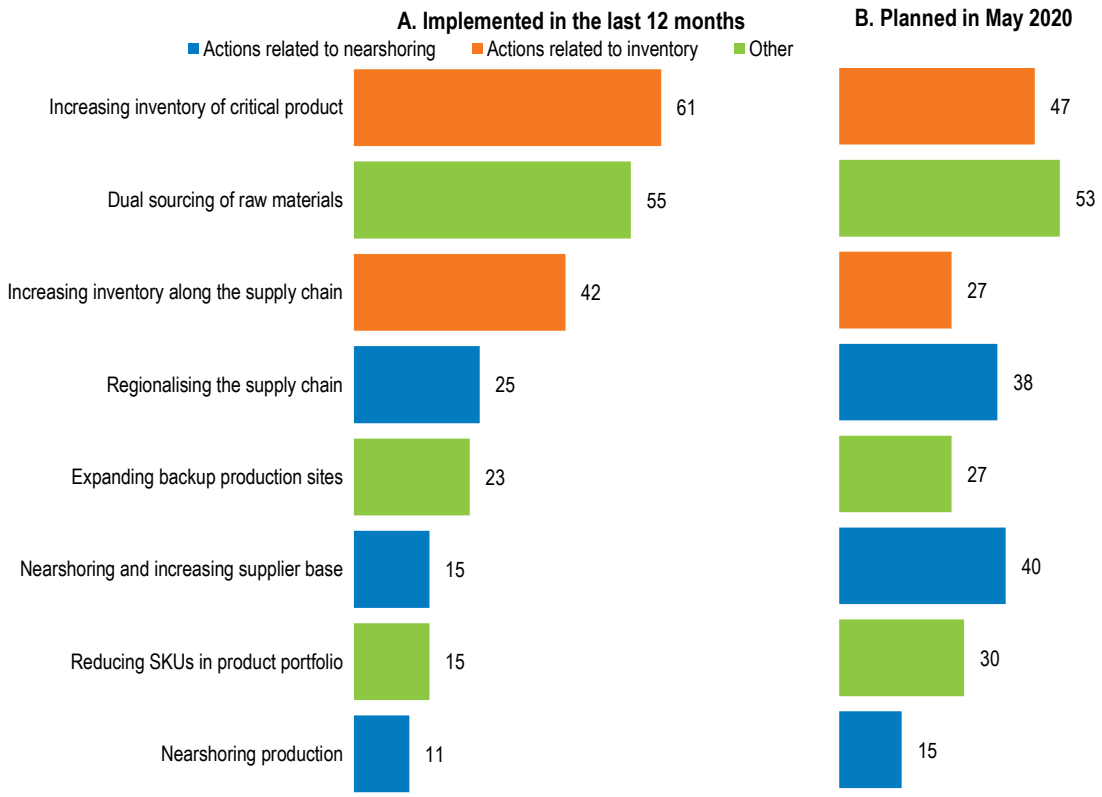
Private firms should strive to gather precise, extensive and timely information, including about warehousing, inventory and transportation (Kamalahmadi and Parast, 2016; Sá et al., 2020). Production processes could be classified as low, medium and high-risk based on criteria such as the impact on revenues if a certain source of supplies is lost, the time it would take a particular supplier's factory to recover from a disruption, and the availability of alternate sources (Shih, 2020). The success of such an endeavour would depend on co-operation of suppliers and customers. The main challenge with this strategy is that collecting and analysing data by firms is costly, especially for smaller firms. Moreover, some firms may not be willing to share data given market sensitive information.

Available, though relatively scant, evidence on improving resilience suggests that firms in recent years, and in particular after the COVID-19 crisis, have expressed a preference for improving their inventory management and for diversifying supplies rather than re/near-shoring production. Several business surveys have indicated that companies in advanced economies mostly increased stockpiles and shifted from just-in-time to just-in-case inventory management (Alicke, 2021 Asian Development Bank, 2021;

Nordström, Elfving and Nilsson, 2021; BCI, 2021; EBRD, 2022) (Figure 2.8).[19] Some companies also planned to diversify their suppliers, including from domestic sources. However, few companies considered re-shoring factories. This could be rationalised by the temporary nature of the COVID-19 shock, sunk costs and the desire to maintain proximity to large emerging markets, in particular China. Such outcomes are consistent with firm-level analysis of Italian multinationals in response to the COVID-19 shock (Di Stefano et al., 2022) and a modest tendency for re-shoring prior to the COVID-19 recession (De Backer et al., 2016). However, re-shoring could intensify with increasing geopolitical polarisation in the world economy and increased automation, and it may be a non-linear process (Every and van Harn, 2022).

Figure 2.8. Companies' intentions and implemented actions to boost supply-chain resilience

Percent of respondents to McKinsey survey of global supply-chain leaders



Source: McKinsey survey of global supply-chain leaders (May 4 – June 16, 2021, n = 71).

StatLink https://stat.link/60s7vd

[19] The Shanghai American Chamber of Commerce China Business Report 2022 reports that only 17% of companies surveyed considered moving operations from China in the next three years and, of these, only 19% planned re-shoring to the United States. Likewise, in response to significant disruption, firms surveyed by the Confederation of Swedish Enterprise from 2020 to 2022 increased their stock levels and sought to diversify suppliers rather than relocate to Europe or Sweden. A survey of businesses in 15 countries by the European Bank for Reconstruction and Development reports that the most common responses to supply chain instability was to increase stockpiles (55%) and to diversify suppliers (49%) (EBRD, 2022). Only 19% of firms re-shored production. This echoes a survey of German manufacturers, where increased stockpiles (68%) and diversifying suppliers were the most common responses (Aksoy et al., 2022).

Governments could also play a role

Improving monitoring of risks and stress-testing is key

Designing measures to improve resilience and robustness of supply chains should be based on a thorough cost-benefit analysis, requiring in-depth understanding of risks. As discussed above, several dimensions of GVC's exposures are not comprehensively measured yet. Thus, there is scope for improvement in this area. Governments could help to co-ordinate data collection, analyse them and distribute results. Several such initiatives have already been taken or are being planned (Box 2.2).

Governments can also collaborate with private firms to promote standards of conduct to reduce risks of supply chain disruptions (robustness) and minimise negative effects once such disruptions materialise (resilience) (OECD, 2021). Such collaboration could be built on the responsible business conduct framework, in line with the OECD Guidelines for Multinational Enterprises and OECD due diligence guidance (OECD, 2018).

Drawing on the experience in the financial sector after the global financial crisis, it has been suggested that governments could also play an active role in developing stress tests for essential supply chains (OECD, 2020; Simchi-Levi and Simchi-Levi, 2020; D'Aguanno et al., 2021). Such initiatives could in principle help increase the transparency of complex GVCs by improving the timeliness and granularity of data needed for monitoring vulnerabilities, and harmonising data. The results of such stress tests could be used for setting requirements for suppliers of essential goods to implement contingency plans in case of supply disruptions. The benefits of such an exercise could be strengthened by international co-operation, where multilateral organisation could play an active role.[20] However, given the considerable heterogeneity of sectors and firms and the large number of unsupervised manufacturing companies (compared with financial institutions), comprehensive stress-testing would not be realistic and could imply high compliance costs for companies. Thus, authorities could rather select a few key sectors or branches and focus on the largest producers. Moreover, it is not clear how such stress tests could be designed, what could be a meaningful and universal metric for assessing firm performance, and how to define shocks.

Governments can help reduce GVC risks but some measures can be costly and ineffective

A universal policy approach to reduce GVC risks is difficult to design given considerable heterogeneity across sectors and firms. In general, governments have three broad sets of direct measures to support risk-reducing strategies. They could be part of industrial and innovation policies. Most such policies focus on re/near/friend-shoring, with fewer measures aimed at diversification and adequate inventories. These measures vary in effectiveness and side effects. They should be tailored to specific problems for specific industries and products.

- *Financial incentives*: governments could encourage re-shoring by imposing tariffs on specific imported products (Dong and Kouvelis, 2020; Feng et al., 2022; Li et al., 2023); taxing profits from off-shore activities; and/or by providing subsidies or tax credits to support domestic production and diversification (Grossman, Helpman and Lhuillier, 2021; Evenett and Fritz, 2021; Xie et al., 2022). Financial incentives could also target domestic innovation and development of production capacity, indirectly encouraging re-shoring. Governments could opt for horizontal measures, such as carbon taxes and preferential tariff rates for near-shored products, affecting broader categories of goods and services (European Union, 2021).

[20] For instance, the Agricultural Market Information System was set up in response to huge gyrations in global food prices in 2006-11 period that partly stemmed from the lack of shared information about food stocks and production outlooks (OECD, 2021). The initiative brought together market analysts, international organisations and government experts from the major agricultural producers and traders. Its main goal is to gather timely, transparent information and analysis on markets, policies and stocks of the main staple food crops (maize, rice, wheat and soybeans).

- *Regulatory measures*: Governments could impose local content requirements (LCRs) to encourage re-shoring. Such measures require firms to use domestically-manufactured goods or domestically-supplied services in order to operate in an economy. There has been a substantial increase in the use of LCRs in recent years, as governments tried to achieve a variety of policy objectives, including employment, and industrial and technological development (OECD, 2019).[21] LCRs could be used as a condition for obtaining subsidies, like is the case of for the US Inflation Reduction Act (Box 2.2), or be part of government procurement policy. Governments could also oblige private companies to maintain pre-defined stocks of critical products, including of pharmaceuticals, oil and gas. Stockpiling requirements could involve financial compensation or be part of public procurement conditions (European Union, 2021).
- *Direct government control*: Governments can manage strategic stockpiles for economic and strategic purposes themselves. Many governments maintain stockpiles of critical supplies such as fuel and medical supplies.[22] Countries should strive to ensure that their national stockpiling strategy aligns with the requirements of their supply chains and that the contents of stockpiles are updated to reflect the demands of industry. In Japan, the Japan Organization for Metals and Energy Security oversees the National Rare Metal Stockpiling Project in collaboration with industry as a safeguard against interruption of supply. In March 2020, the government announced an intention to review how stockpile targets are set and to set them exclusively for government stockpiles, no longer including industry stockpiles (IEA, 2022). The United States also maintains the National Defense Stockpile with the stated mission to "decrease and preclude dependence upon foreign sources or single points of failure for strategic materials in times of national emergency." In March 2022, an agreement expanding the remit of the stockpile to include materials critical for clean energy technologies was signed (IEA, 2022).

Governments could continue using regional trade agreements (RTAs) to encourage near/friend-shoring. RTAs have been actively used in the past two decades and cover more than half of international trade (Lee, Mulabdic and Ruta, 2019; Mattoo, Rocha and Ruta, 2020; OECD, 2020). They involve preferential tariffs to partners within the trading block but could address also several frontier issues related to digital trade, anti-corruption, investment, environmental standards, state-owned enterprises and intellectual property rights. Thus, they could be effective not only in reducing trade costs but also in building closer economic co-operation based on similar rules and thus nourishing trade integration and national security. Granting preferences in government procurement and incentives programmes among allies could be another way to promote friend-shoring.[23]

[21] Since the global financial crisis, more than 340 localisation measures, including over 145 new local content requirements, have been put in place by governments largely to improve domestic employment and industrial performance (OECD, 2019).

[22] For instance, Australia's National Medical Stockpile, Canada's National Emergency Strategic Stockpile and US Strategic National Stockpile are strategic reserves of essential medical supplies and equipment. The United States maintains the Strategic Petroleum Reserve and the EU requires members states to stockpile a 90-day supply of oil.

[23] Friend-shoring could be also encouraged by extending government incentives to promote domestic production capacities in strategic sectors and granting preferences in government procurement to friendly countries. For instance, there have been calls for multilateralising the provisions of the US Inflation Reduction Act (Box 2.2) to US free trade partners (Noland, 2023).

Box 2.2. Selected public policy initiatives motivated by GVC risk-reducing objectives

Improving monitoring of GVC risks and stress-testing

There are still gaps in understanding of GVC risks and governments can plan an active role in filling in these gaps. Several governments initiatives to co-ordinate data collection and analyse them have already been taken or are being planned.

- The US government undertook risk reviews of supply chains with a particular emphasis on semiconductors, high-capacity batteries, critical minerals and strategic materials and pharmaceuticals and active pharmaceutical ingredients (The White House, 2021). These reviews identified goods and services needed for the supply chains to function; risks that could disrupt these supply chains; and the resilience of American manufacturing towards the risks identified. The reports also considered allied and partner actions and made recommendations on how supply chain resilience can be improved.
- The EU has also engaged in a review of "strategic dependencies", including six specific in-depth reviews,[1] as part of the 2021 update to the 2020 Industrial Strategy. Strategic trade dependencies have been identified through an initial bottom-up quantitative analysis of the EU's total trade flows to identify sectors where the European Union was reliant on a limited number of suppliers. This was followed by qualitative assessments of sectors and ecosystems that may be of strategic significance and the dependencies within these sectors that drive this exposure (European Commission, 2021). There are also calls in the European Union for establishing an early warning system to anticipate shortages of strategic inputs, by introducing regular information exchange obligations, in the context of the forthcoming EU Critical Raw Materials Act. The EU Chips Act establishes a monitoring and crisis response mechanism with respect to Europe's supply of semiconductors (see below).

Increasing resilience by diversifying domestic and international suppliers

Concerns over the resilience of supply of manufactured goods that are critical inputs for the economy due to high concentration of production abroad have led some governments to support domestic production.

- The United States introduced the US CHIPS and Science Act for the development of domestic semiconductors production capacity. The CHIPS and Science Act authorises over $52 billion over ten years (0.22% of annual GDP) in incentives to increase the production of semiconductors and the construction of fabrication facilities in the United States. These incentives include tax credits for investment in manufacturing, sectoral R&D funding and funding for education and skills (Cooper, 2022). Alongside the CHIPS and Science Act, the United States also passed the Inflation Reduction Act (IRA) to, among other goals, reduce carbon emissions in the transport sector by subsiding sales of electric vehicles. To support the development of secure supply chains for the United States' supply of electric vehicles, the vehicle, the vehicle's battery and the battery's critical minerals must meet thresholds for construction or sourcing in North American or from trusted trade partners to be eligible for the full suite of available subsidies (The White House, 2023).

- Likewise, the European Commission has proposed the European Chips Act. The proposal is based on a three-pillar structure: a "Chips for Europe" initiative which seeks to improve Europe's chips pipeline at all steps of the value chain; "security of supply" focussed on strategic manufacturing facilities; and monitoring and crisis response, which establishes a monitoring and crisis response mechanism with respect to Europe's supply of semiconductors. The act provides derogations to state aid rules for key facilities, provides €3.3 billion (0.02 % of GDP) in EU funds to relevant projects, and seeks to rationalise investment by member states. The European Commission intends to mobilise €43 billion (0.3% of GDP) in public and private funds through the act (Ragonnaud, 2022).
- The Republic of Korea launched its Materials, Parts, Equipment 2.0 Strategy in July 2020 to prepare the economy for shifts in global supply chains after the COVID-19 pandemic. The government committed to spending 1.5 trillion won over five years (0.08% of annual GDP) on R&D and offered direct support to firms to cover relocation costs, with additional support provided to firms that relocate outside the Seoul region and those that build smart factories (Szczepański, 2021).

Improving security of critical minerals

Several economies have drawn up or are planning strategies to improve their security of supply of critical materials.

- In the United States, these strategies generally aim at: developing recycling and reprocessing technologies and alternative technologies to limit the use of critical materials; expanding the production and processing capacities; and enhance international trade and co-operation regarding critical materials (U.S Department of Commerce, 2019).
- Similar objectives are likely to be part of the forthcoming EU Critical Raw Materials Act. The European Union has established the European Raw Materials Alliance which brings together a range of relevant stakeholders to attract investment into the supply chains, foster innovation and support recycling and the circular economy.
- Canada seeks to leverage its substantial reserves of minerals in a sustainable and responsible manner. The Canadian Minerals and Metals Plan focusses on promoting investment, and the Green Mining Innovation Initiative intends to accelerate the development of green mining technologies(IEA, 2021).

However, countries, frequently not in the OECD, have also implemented protectionist measures. The number of export restrictions on critical raw materials increased globally more than five-fold over the last decade (Kowalski and Legendre, 2023). Consequently, about 10% of the global value of exports of critical raw materials faced at least one export restriction measure in recent years. Such policies could have negative spillovers (Chen, Hu and Li, 2021).

1. These were raw materials, active pharmaceutical ingredients, li-on batteries, clean hydrogen, cloud and edge computing, and semi-conductors.

Friend-shoring may be ineffective. Strategies to encourage friend-shoring may be undermined by parallel policies to encourage re-shoring if partners perceive subsidies and tariff barriers as protectionist in intent and introduce corresponding measures (Echikson, 2022). Furthermore, commentary on friend-shoring elements of the US Inflation Reduction Act (Box 2.2) suggests that manufacturers would find it difficult to meet the requirements to benefit from tax credits and that the narrow list of eligible countries would limit their capacity to benefit from it (Harput, 2022).

Scant empirical evidence on the effectiveness of the government policy measures to encourage re-shoring and friend-shoring is mixed.

- Re-shoring policies pursued in the United States, the United Kingdom and Japan in recent years have been found to be only modestly effective (European Union, 2021). In particular, tariff policies are likely to have limited effectiveness for promoting re-shoring, especially if there is uncertainty about their duration and size. While some manufacturing jobs have been indeed re-shored and capital investment increased, off-shoring still continued and dominated the macroeconomic outcomes (De Backer et al., 2016).
- LCRs have a predominately negative impact on economic development and trade, even if they could help achieve short-term government's objective (OECD, 2019). They result in long-run inefficiencies not only in the affected sector but also in the rest of the economy (Stone, Messent and Flaig, 2015). These inefficiencies ultimately reduce job growth and opportunities to achieve economies of scale and to innovate, undermining objectives for imposing LCRs.

Similarly, changes in the regional value contents of car manufacturers following the adoption of the United States-Mexico-Canada Agreement (USMCA) did increase the proportion of imports of these products into the United States that came from Mexico and Canada (Hsu, Li and Wu, 2022). However, firms were much more likely to near-shore non-ICT elements of production. This aligns with the observation that ICT production is capital intensive and, therefore, less attractive for near-shoring.

The government measures discussed above, in principle, should be implemented if their costs are expected to be lower than their benefits in terms of higher resilience (OECD, 2020). However, due to the complexity of modern supply chains, it is very difficult for governments to fully evaluate policies aimed at building resilience and the distortions these policies create (Grossman, Helpman and Lhuillier, 2021).

The main concern about distortions relates to efficiency effects of policies aimed at reducing foreign exposures as they can impose significant welfare losses (Levine, 2012). As discussed above, replacing imports with domestic production could negatively affect prices, productivity and the variety of products available. Adverse economy-wide consequences of protectionist policies in specific sectors are likely to be the largest for the most central sectors in a given supply chain. This reflects the fact that many remaining sectors are dependent on inputs from them (Grassi and Sauvagnat, 2019). This is important as calls for government support are particularly strong in several of the central sectors, including semiconductors (Box 2.2). Increased policy interventions to reduce foreign dependencies could also raise business uncertainty, with negative implications for investment and employment. It is also possible that government measures could lead to overinvestment in resilience, resulting in lower levels of production. Such an outcome is particularly likely if governments assume that the private sector underinvests without sound evidence (Grossman, Helpman and Lhuillier, 2021).

Such concerns are equally present for policies driven by national security considerations as evaluating the economic costs and effectiveness of such policies is challenging. National security rhetoric has been increasingly influencing economic policy and in an increasing number of areas (Murphy and Topel, 2013; Heath, 2020).[24] National security has become more intertwined with international economics and foreign policy (Lind, 2019) and has been used as argument for industrial and protectionist policies to buttress state control, self-sufficiency and resilience. In principle, threats to national security can justify implementing measures to provide insurance against negative geopolitical events or acting to prevent such undesirable

[24] A strong economy and, in particular, manufacturing sector, has always been intertwined with national security as many goods and technologies can have both military and commercial uses. In recent decades, national security risks expanded substantially, moving from purely military considerations to areas such as natural disasters, cybersecurity, infectious diseases, climate change and international trade and investment. The increasing multipolarity of the world economy, the rise of state capitalism and growing concerns about resource scarcity have been among the key factors behind these developments (Thirlwell, 2010).

events (see above). However, in practice, risks of geopolitical events and the associated economic costs are difficult to evaluate, even if, *ex-post*, such costs may turn out very high.[25] Besides, some policy measures, especially if taken unilaterally, may prove ineffective in ensuring security objectives.[26] To minimise risks that such policies will be costly for taxpayers and consumers, objective and thorough evaluations are needed.

Protectionist policies could reduce international co-operation and thus hinder achievement of social and environmental objectives at a global scale. Trade and financial integration facilitate international co-operation. In contrast, if re-shoring and friend-shoring-oriented government policies result in an economically and geopolitically fragmented world, international co-operation in several areas would be affected negatively.

- It could be more difficult to make a co-ordinated response to climate change (Rajan, 2022). Achieving and enforcing international agreements on climate change mitigation policies is easier in an economically integrated world, with few barriers to trade and investment. Protectionist measures and geo-strategically motivated sanctions lead to geopolitical rivalries and mistrust. Moreover, deglobalisation could also hinder the development of technologies and production of goods needed to accelerate the decarbonisation process. Open globalisation could help to facilitate the reallocation of production in the future from the climate-hit places to those less affected by climate change.
- Inward-oriented policies could reduce knowledge spillovers and academic co-operation, with negative consequences for technological progress and productivity growth (Cerdeiro et al., 2021; Góes et al., 2022).[27] Countries closing themselves to international trade would likely hinder openness to ideas and people (Iakovou and White III, 2020). Consequently, they could become less attractive as innovation centres and as employers for an internationally mobile, talented workforce, to the benefit of other countries (Kato and Sparber, 2013; Glennon, 2020). This could be particularly consequential in advanced economies with rapidly ageing populations and thus with shrinking work force.
- Protectionist policies by one country or economic area could result in other countries adopting similar measures that could magnify welfare losses from a less integrated world economy. Proliferation of tit-for-tat policies could upend the international system of trade and investment that has been built over past decades. Moreover, there is a risk that demands for protectionist measures could increase with domestic companies becoming less competitive as a result of re-shoring policies (OECD, 2020).

Given the many possible side effects and risks of governmental policies, it would be good to subject such measures to comprehensive evaluation and consultations, involving international organisations, academic experts, regulators and industry representatives (European Union, 2021).

[25] For instance, the cuts in Russian gas supplies to Europe and the EU ban on imports into the European Union of Russian oil in the aftermath of Russia's war against Ukraine implied significant economic costs given the high dependence of Europe on imports of Russian gas and oil.

[26] The history of using export controls during the Cold War shows that uncoordinated efforts to limit access for geopolitical adversaries to technologies that are important for military uses were futile (Bown, 2023).

[27] A division of the global economy into two blocks could lead to losses, ranging from as little as 0.4% of GDP for some countries in a scenario of very limited decoupling to as much as 12% of GDP for the most affected countries under full technological decoupling (Góes et al., 2022). Multiple scenarios of technological decoupling simulated in a global dynamic macroeconomic model suggest that technological fragmentation can lead to losses of around 5% of GDP for many economies, but around 8.5% of GDP in the more severe scenarios for the most severely affected countries (Cerdeiro et al., 2021).

Bibliography

Acemoglu, D. and D. Autor (2011), Skills, Tasks and Technologies: Implications for Employment and Earnings, Elsevier, https://www.sciencedirect.com/science/article/pii/S0169721811024105.

Acemoglu, D. and P. Azar (2020), "Endogenous Production Networks", Econometrica, Vol. 88/1, https://doi.org/10.3982/ecta15899.

Acemoglu, D. et al. (2012), "The Network Origins of Aggregate Fluctuations", Econometrica, Vol. 80/5, https://doi.org/10.3982/ecta9623.

Aksoy, C. et al. (2022), Reactions to Supply Chain Disruptions: Evidence from German Firms, https://www.econpol.eu/publications/policy_brief_45.

Alicke, K. (2021), How COVID-19 is reshaping supply chains?, McKinsey & Company, https://www.mckinsey.com/capabilities/operations/our-insights/how-covid-19-is-reshaping-supply-chains.

Allianz SE (2021), The Suez canal ship is not the only thing clogging global trade, https://www.allianz.com/en/economic_research/publications/specials_fmo/2021_03_26_SupplyChainDisruption.html (accessed on 23 January 2023).

Altomonte, C., I. Colantone and L. Bonacorsi (2018), "Trade and Growth in the Age of Global Value Chains", SSRN Electronic Journal, https://doi.org/10.2139/ssrn.3295553.

Antràs, P. (2020), De-Globalisation? Global Value Chains in the Post-COVID-19 Age, National Bureau of Economic Research, Cambridge, MA, https://doi.org/10.3386/w28115.

Antràs, P., T. Fort and F. Tintelnot (2017), "The Margins of Global Sourcing: Theory and Evidence from US Firms", American Economic Review, Vol. 107/9, pp. 2514-2564, https://doi.org/10.1257/aer.20141685.

Ardelean, A., M. Leon-Ledesma and L. Puzzello (2022), "Growth Volatility and Trade: Market Diversification vs. Production Specialization", Discussion Papers, No. 2022-11, Monash Business School. Department of Economics.

Arriola, C. et al. (2020), "Efficiency and risks in global value chains in the context of COVID-19", OECD Economics Department Working Papers, No. 1637, OECD Publishing, Paris, https://doi.org/10.1787/3e4b7ecf-en

Asian Development Bank (2021), Global Value Chain Development Report 2021:, Asian Development Bank, Manila, Philippines, https://doi.org/10.22617/tcs210400-2.

Autor, D., D. Dorn and G. Hanson (2013), "The China Syndrome: Local Labor Market Effects of Import Competition in the United States", The American Economic Review, Vol. 103/6, pp. 2121-2168, http://www.jstor.org/stable/42920646.

Baldwin, R. (2022), The peak globalisation myth: Part 2 – Why the goods trade ratio declined, https://cepr.org/voxeu/columns/peak-globalisation-myth-part-2-why-goods-trade-ratio-declined (accessed on 4 January 2023).

Baldwin, R. and R. Freeman (2022), "Risks and Global Supply Chains: What We Know and What We Need to Know", Annual Review of Economics, Vol. 14/1, pp. 153-180, https://doi.org/10.1146/annurev-economics-051420-113737.

Baldwin, R., R. Freeman and A. Theodorakopoulos (2022), Horses for Courses: Measuring Foreign Supply Chain Exposure, National Bureau of Economic Research, Cambridge, MA, https://doi.org/10.3386/w30525.

BCI (2021), Supply Chain Resilience Report 2021, https://www.thebci.org/uploads/assets/e02a3e5f-82e5-4ff1-b8bc61de9657e9c8/BCI0007h-Supply-Chain-Resilience-ReportLow-Singles.pdf.

Bejan, M. (2011), "Trade Openness and Output Volatility", SSRN Electronic Journal, https://doi.org/10.2139/ssrn.965824.

Bonneau, C. and M. Nakaa (2020), Vulnerability of French and European imports, https://www.tresor.economie.gouv.fr/Articles/9ca1aa95-fd2a-4dec-9e76-b65a68c3fe29/files/e7566b5e-a5ae-4304-be42-917dd26651ff.

Borin, A., M. Mancini and D. Taglioni (2021), Measuring Exposure to Risk in Global Value Chains, http://www.worldbank.org/prwp.

Bown, C. (2023), The Return of Export Controls. A Risky Tactic That Requires Cooperation From Allies, https://www.foreignaffairs.com/united-states/return-export-controls.

Buch, C., J. Döpke and H. Strotmann (2021), "Does Trade Openness Increase Firm-Level Volatility?", SSRN Electronic Journal, https://doi.org/10.2139/ssrn.2785267.

Carvalho, V. et al. (2021), Supply chain disruptions: Evidence from the great east japan earthquake, https://doi.org/10.1093/qje/qjaa044.

Carvalho, V. and A. Tahbaz-Salehi (2019), Production Networks: A Primer, https://doi.org/10.1146/annurev-economics-080218-030212.

Caselli, F. et al. (2020), "Diversification Through Trade", Quarterly Journal of Economics, Vol. 135/1, https://doi.org/10.1093/qje/qjz028.

Cavallo, E. (2009), "Output Volatility and Openness to Trade: A Reassessment", Economía, Vol. 9/1, https://doi.org/10.1353/eco.0.0014.

Cerdeiro, D. et al. (2021), "Sizing Up the Effects of Technological Decoupling", IMF Working Papers, Vol. 2021/069, https://doi.org/10.5089/9781513572673.001.

Cheng, M. et al. (2015), Reaping the benefits from global value chains, International Monetary Fund, https://www.imf.org/external/pubs/ft/wp/2015/wp15204.pdf.

Chen, Z., Z. Hu and K. Li (2021), "The spillover effect of trade policy along the value Chain: Evidence from China's rare earth-related sectors", World Economy, Vol. 44/12, https://doi.org/10.1111/twec.13172.

Cingolani, I., L. Iapadre and L. Tajoli (2018), "International production networks and the world trade structure", International Economics, Vol. 153, https://doi.org/10.1016/j.inteco.2017.10.002.

Cooper, V. (2022), Explainer: The CHIPS and Science Act 2022, https://www.ussc.edu.au/analysis/explainer-the-chips-and-science-act-2022 (accessed on 16 January 2023).

Criscuolo, C. and J. Timmis (2018), "GVCS and centrality: Mapping key hubs, spokes and the periphery", OECD Productivity Working Papers, No. 12, OECD Publishing, Paris, https://doi.org/10.1787/d4a9bd6f-en.

D'Aguanno, L. et al. (2021), Global value chains, volatility and safe openness: is trade a double-edged sword?, Bank of England, https://www.bankofengland.co.uk/financial-stability-paper/2021/global-value-chains-volatility-and-safe-openness-is-trade-a-double-edged-sword.

De Backer, K. et al. (2016), "Reshoring: Myth or Reality?", OECD Science, Technology and Industry Policy Papers, No. 27, OECD Publishing, Paris, https://doi.org/10.1787/5jm56frbm38s-en.

Di Stefano, E. et al. (2022), "Reshoring and plant closures in Covid-19 times: Evidence from Italian MNEs", International Economics, Vol. 172, pp. 255-277, https://doi.org/10.1016/j.inteco.2022.09.009.

Dollar, D. and A. Kraay (2004), "Trade, Growth, and Poverty", The Economic Journal, Vol. 114/493, pp. F22-F49, https://doi.org/10.1111/j.0013-0133.2004.00186.x.

Dong, L. and P. Kouvelis (2020), "Impact of tariffs on global supply chain network configuration: Models, predictions, and future research", Manufacturing and Service Operations Management, Vol. 22/1, https://doi.org/10.1287/msom.2019.0802.

Durand, C. and W. Milberg (2019), "Intellectual monopoly in global value chains", Review of International Political Economy, Vol. 27/2, pp. 404-429, https://doi.org/10.1080/09692290.2019.1660703.

Easterly, W., R. Islam and J. Stiglitz (2001), Shaken and stirred: explaining growth volatility, *Annual World Bank conference on development economics*.

EBRD (2022), Global supply chains in turbulence, European Bank for Reconstruction and Development, https://2022.tr-ebrd.com/global-supply-chains-in-turbulence/.

Echikson, B. (2022), Made in America, Made in France: Protectionism Threatens the Atlantic Tech Alliance, https://cepa.org/article/made-in-america-made-in-france-protectionism-threatens-the-atlantic-tech-alliance/ (accessed on 3 January 2023).

Égert, B. (2017), "Regulation, institutions and productivity: New macroeconomic evidence from OECD countries", OECD Economics Department Working Papers, No. 1393, OECD Publishing, Paris, https://doi.org/10.1787/579ceba4-en.

Eppinger, P. et al. (2021), "Decoupling Global Value Chains", SSRN Electronic Journal, https://doi.org/10.2139/ssrn.3848341.

European Commission (2021), "Strategic Dependencies and Capacities", Commission Staff Working Document, SWD(2021) 352 final.

European Union (2021), Post Covid-19 value chains: options for reshoring production back to Europe in a globalised economy, Policy Department for External Relations, Directorate General for External Policies of the Union.

Evenett, S. and J. Fritz (2021), Subsidies and Market Access Towards an Inventory of Corporate Subsidies by China, the European Union and the United States, The 28th Global Trade Alert Report.

Every, M. and E. van Harn (2022), "Friendshoring: Who will benefit?", No. 417, SUERF, https://www.suerf.org/suer-policy-brief/52535/friendshoring-who-will-benefit.

Fajgelbaum, P. and A. Khandelwal (2016), "Measuring the unequal gains from trade", Quarterly Journal of Economics, Vol. 131/3, https://doi.org/10.1093/qje/qjw013.

Farrell, H. and A. Newman (2022), "Weak links in finance and supply chains are easily weaponized", Nature, Vol. 605/7909, pp. 219-222, https://doi.org/10.1038/d41586-022-01254-5.

Federal Ministry of Agriculture Regions and Tourism (2022), World Mining Data 2022, https://www.world-mining-data.info/wmd/downloads/PDF/WMD2022.pdf.

Feinmann, J. (2021), "What happened to our national emergency stockpiles?", BMJ, p. n2849, https://doi.org/10.1136/bmj.n2849.

Felbermayr, G. and S. Peterson (2020), Economic assessment of Carbon Leakage and Carbon Border Adjustment, https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/603501/EXPO_BRI(2020)603501_EN.pdf.

Feng, P. et al. (2022), "The impact of trade policy on global supply chain network equilibrium: A new perspective of product-market chain competition", Omega (United Kingdom), Vol. 109, https://doi.org/10.1016/j.omega.2022.102612.

Freeland, C. (2022), Remarks by the Deputy Prime Minister at the Brookings Institution in Washington, D.C., https://deputypm.canada.ca/en/news/speeches/2022/10/11/remarks-deputy-prime-minister-brookings-institution-washington-dc.

Giovanni, J. and A. Levchenko (2009), "Trade Openness and Volatility", Review of Economics and Statistics, Vol. 91/3, pp. 558-585, https://doi.org/10.1162/rest.91.3.558.

Glennon, B. (2020), How Do Restrictions on High-Skilled Immigration Affect Offshoring? Evidence from the H-1B Program, National Bureau of Economic Research, Cambridge, MA, https://doi.org/10.3386/w27538.

Góes, C. et al. (2022), “The Impact of Geopolitical Conflicts on Trade, Growth, and Innovation”, WTO Staff Working Papers ERSD-2022-9, World Trade Organization (WTO), Economic Research and Statistics Division.

Grassi, B. and J. Sauvagnat (2019), “Production networks and economic policy”, Oxford Review of Economic Policy, Vol. 35/4, pp. 638-677, https://doi.org/10.1093/oxrep/grz021.

Grossman, G., E. Helpman and H. Lhuillier (2021), “Supply Chain Resilience: Should Policy Promote Diversification or Reshoring?”, SSRN Electronic Journal, https://doi.org/10.2139/ssrn.3935518.

Haddad, M. et al. (2013), “Trade openness reduces growth volatility when countries are well diversified”, Canadian Journal of Economics, Vol. 46/2, https://doi.org/10.1111/caje.12031.

Haramboure, A., G. Lalanne and C. Schwellnus (2023), "Vulnerabilities in the semiconductor supply chain", OECD Science, Technology and Industry Working Papers, No. 2023/05, OECD Publishing, Paris, https://doi.org/10.1787/6bed616f-en.

Harput, H. (2022), “What Policy Initiatives Advance Friend-Shoring?”, Zeitgeist Series, No. 2, Global Trade Alert.

Heath, B. (2020), “The new national security challenge to the economic order”, Yale Law Journal, Vol. 129/4.

Heiland, I. et al. (2019), “Trade From Space: Shipping Networks and The Global Implications of Local Shocks”, CEPR Discussion Papers.

Heiland, I. and K. Ulltveit-Moe (2020), “An unintended crisis is sea transportation due to COVID-19 restrictions”, in COVID-19 and Trade Policy: Why Turning Inward Won’t Work.

Heimberger, P. (2020), “Does economic globalisation affect income inequality? A meta-analysis”, World Economy, Vol. 43/11, https://doi.org/10.1111/twec.13007.

Helpman, E. (2018), Globalization and Inequality, Harvard University Press.

Hsu, J., Z. Li and J. Wu (2022), “Keeping Your Friends Closer: Friend-shoring in Response to Regional Value Content Requirements”, SSRN Electronic Journal, https://doi.org/10.2139/ssrn.4246225.

Iakovou, E. and C. White III (2020), How to build more secure, resilient, next-gen U.S. supply chains, https://www.brookings.edu/techstream/how-to-build-more-secure-resilient-next-gen-u-s-supply-chains/.

IEA (2022), Global Supply Chains of EV Batteries, International Energy Agency, Paris, https://www.iea.org/reports/global-supply-chains-of-ev-batteries.

IEA (2022), International Resource Strategy - National stockpiling system, https://www.iea.org/policies/16639-international-resource-strategy-national-stockpiling-system (accessed on 11 January 2023).

IEA (2022), Securing Clean Energy Technology Supply Chains, International Energy Agency, Paris, https://www.iea.org/reports/securing-clean-energy-technology-supply-chains.

IEA (2022), Special Report on Solar PV Global Supply Chains, International Energy Agency, Paris, https://www.iea.org/reports/solar-pv-global-supply-chains.

IEA (2022), Strategic and Critical Materials Stock Piling Act, https://www.iea.org/policies/15534-strategic-and-critical-materials-stock-piling-act (accessed on 11 January 2023).

IEA (2021), The Role of Critical Minerals in Clean Energy Transitions, OECD Publishing, Paris, https://doi.org/10.1787/f262b91c-en.

Jaax, A., S. Miroudot and E. van Lieshout (2023), "Deglobalisation? The reorganisation of global value chains in a changing world", OECD Trade Policy Papers, No. 272, OECD Publishing, Paris, https://doi.org/10.1787/b15b74fe-en.

Jaravel, X. and E. Sager (2019), “What are the Price Effects of Trade? Evidence from the U.S. and Implications for Quantitative Trade Models”, Finance and Economics Discussion Series, Vol. 2019/068, pp. 1-110, https://doi.org/10.17016/FEDS.2019.068.

Javorcik, B. et al. (2022), “Economic Costs of Friend-Shoring”, European Bank for Reconstruction and Development, London.

Kamalahmadi, M. and M. Parast (2016), “A review of the literature on the principles of enterprise and supply chain resilience: Major findings and directions for future research”, International Journal of Production Economics, Vol. 171, https://doi.org/10.1016/j.ijpe.2015.10.023.

Kato, T. and C. Sparber (2013), “Quotas and quality: The effect of H-1B visa restrictions on the pool of prospective undergraduate students from abroad”, Review of Economics and Statistics, Vol. 95/1, https://doi.org/10.1162/REST_a_00245.

Kowalski, P. and C. Legendre (2023),), "Raw materials critical for the green transition: Production, international trade and export restrictions", OECD Trade Policy Papers, No. 269, OECD Publishing, Paris, https://doi.org/10.1787/c6bb598b-en.

Lee, W., A. Mulabdic and M. Ruta (2019), Third-Country Effects of Regional Trade Agreements: A Firm-Level Analysis, Journal of International Economics, Vol. 140, https://doi.org/10.1596/1813-9450-9064.

Levine, D. (2012), “Production chains”, Review of Economic Dynamics, Vol. 15/3, pp. 271-282, https://doi.org/10.1016/j.red.2012.01.003.

Lind, M. (2019), “The return of geo-economics”, National Interest, Vol. 2019/164, https://nationalinterest.org/feature/return-geoeconomics-87826.

Li, W. et al. (2023), “Outsourcing decision-making in global remanufacturing supply chains: The impact of tax and tariff regulations”, European Journal of Operational Research, Vol. 304/3, pp. 997-1010, https://doi.org/10.1016/j.ejor.2022.05.016.

Lund, S. (2020), Risk, resilience, and rebalancing in global value chains, McKinsey Global Institute, New York, https://www.mckinsey.com/capabilities/%20operations/our-insights/risk-resilience-and-rebalancing-in-global-value-chains.pdf (accessed on 21 December 2022).

Mattoo, A., N. Rocha and M. Ruta (2020), Handbook of Deep Trade Agreements, https://doi.org/10.1596/978-1-4648-1539-3.

McIvor, R. and L. Bals (2021), “A multi-theory framework for understanding the reshoring decision”, International Business Review, Vol. 30/6, p. 101827, https://doi.org/10.1016/j.ibusrev.2021.101827.

Meier, M. and E. Pinto (2020), “COVID-19 supply chain disruptions”, Covid Econ, Vol. 48/239.

Miroudot, S. (2020), “Resilience versus robustness in global value chains: Some policy implications”, in COVID-19 and Trade Policy: Why Turning Inward Won’t Work.

Mitra, S. (2020), Drivers and Benefits of Enhancing Participation in Global Value Chains: Lessons for India, Asian Development Bank, https://doi.org/10.22617/wps200430-2.

Murphy, K. and R. Topel (2013), Some basic economics of national security, American Economic Review, Vol. 103(3), May, pp. 508-11, https://doi.org/10.1257/aer.103.3.508.

Newbery, D. and J. Stiglitz (1984), “Pareto inferior trade”, Review of Economic Studies, Vol. 51/1, https://doi.org/10.2307/2297701.

Noland, M. (2023), A thoughtful vision of the future of globalization, https://www.piie.com/blogs/realtime-economics/thoughtful-vision-future-globalization.

Nordström, H., A. Elfving and E. Nilsson (2021), “Impact of the coronavirus pandemic on the international supply chain of Swedish firms and measures to reduce vulnerability. A survey in collaboration with the Confederation of Swedish Enterprise”, SSRN Electronic Journal, https://doi.org/10.2139/ssrn.3830346.

OECD (2022), OECD Economic Outlook, Volume 2022 Issue 1, OECD Publishing, Paris, https://doi.org/10.1787/62d0ca31-en.

OECD (2021), "Building resilience: New strategies for strengthening infrastructure resilience and maintenance", OECD Public Governance Policy Papers, No. 05, OECD Publishing, Paris, https://doi.org/10.1787/354aa2aa-en.

OECD (2021), Fostering Economic Resilience in A World of Open and Integrated Markets. Risks, Vulnerabilities and Areas for Policy Action, OECD Publishing, https://www.oecd.org/newsroom/OECD-G7-Report-Fostering-Economic-Resilience-in-a-World-of-Open-and-Integrated-Markets.pdf.

OECD (2020), Acquisition- and ownership-related policies to safeguard essential security interests Current and emerging trends, observed designs, and policy practice in 62 economies, OECD Publishing.

OECD (2020), "COVID-19 and global value chains: Policy options to build more resilient production networks", OECD Policy Responses to Coronavirus (COVID-19), OECD Publishing, Paris, https://doi.org/10.1787/04934ef4-en.

OECD (2020), Regional Trade Agreements, OECD Publishing, https://www.oecd.org/trade/topics/regional-trade-agreements/.

OECD (2019), Local Content Requirements, OECD Publishing.

OECD (2018), OECD Due Diligence Guidance for Responsible Business Conduct, OECD Publishing.

OECD (2017), "How to make trade work for all", OECD Publishing, Paris, https://doi.org/10.1787/eco_outlook-v2017-1-3-en.

OECD (2013), "The rise of global value chains", in Interconnected Economies: Benefiting from Global Value Chains, OECD Publishing, Paris, https://doi.org/10.1787/9789264189560-3-en.

Pierce, J. and P. Schott (2016), "The Surprisingly Swift Decline of US Manufacturing Employment", American Economic Review, Vol. 106/7, pp. 1632-1662, https://doi.org/10.1257/aer.20131578.

Ragonnaud, G. (2022), The EU chips act: Securing Europe's supply of semiconductors, European Parliamentary Research Service.

Rajan, R. (2022), Deglobalization Is a Climate Threat, https://www.project-syndicate.org/commentary/deglobalization-threatens-fight-against-climate-change-by-raghuram-rajan-2022-11.

Ritchie, H. (2023), The mineral monopoly: will low-carbon technology be controlled by a few countries?, https://hannahritchie.substack.com/p/mineral-energy-security (accessed on 23 January 2023).

Rodrik, D. (2021), "Why Does Globalization Fuel Populism? Economics, Culture, and the Rise of Right-Wing Populism", Annual Review of Economics, Vol. 13/1, pp. 133-170, https://doi.org/10.1146/annurev-economics-070220-032416.

Rodrik, D. (1998), "Has Globalization Gone Too Far?", Challenge, Vol. 41/2, pp. 81-94, http://www.jstor.org/stable/40721822.

Rodrik, D. (1998), "Why do more open economies have bigger governments?", Journal of Political Economy, Vol. 106/5, https://doi.org/10.1086/250038.

Sáenz, M. and E. Revilla (2014), "Creating more resilient supply chains", MIT Sloan Management Review, Vol. 55/4.

Salomon, O. (2022), Can nearshoring solve supply chain resilience?, Savills World Research, https://www.savills.com/impacts/market-trends/can-nearshoring-solve-supply-chain-resilience.html (accessed on 22 December 2022).

Sá, M. et al. (2020), "Supply chain resilience: the whole is not the sum of the parts", International Journal of Operations and Production Management, Vol. 40/1, https://doi.org/10.1108/IJOPM-09-2017-0510.

Sandkamp, A. (2022), "Reshoring by Decree? The Effects of Decoupling Europe from Global Value Chains", Intereconomics, Vol. 57/6, pp. 359-362, https://doi.org/10.1007/s10272-022-1087-9.

Schwellnus, C. et al. (2023), "Global value chain dependencies under the magnifying glass", OECD Science, Technology and Industry Policy Papers, No. 142, OECD Publishing, Paris, https://doi.org/10.1787/b2489065-en.

Shih, W. (2020), "Global Supply Chains in a Post-Pandemic World", Harvard Business Review, Vol. 98/5.

Shih, W. (2020), "Is it time to rethink globalized supply chains?", MIT Sloan Management Review, Vol. 61/4.

Simchi-Levi, D. and E. Simchi-Levi (2020), "We Need a Stress Test for Critical Supply Chains", Harvard Business Review Digital Articles, Vol. 28.

Stone, S., J. Messent and D. Flaig (2015), "Emerging Policy Issues: Localisation Barriers to Trade", OECD Trade Policy Papers, No. 180, OECD Publishing, Paris, https://doi.org/10.1787/5js1m6v5qd5j-en.

Supply Chain Connect (2020), How Much Will it Cost to Reshore the World's Supply Chains?, https://www.supplychainconnect.com/supply-chain/article/21139970/how-much-will-it-cost-to-reshore-the-worlds-supply-chains.

Szczepański, M. (2021), Resilience of global supply chains: Challenges and solutions, European Parliamentary Research Service.

The White House (2023), Building a Clean Energy Economy: A Guidebook to the Inflation Reduction Act's Investments in Clean Energy and Climate Action.

The White House (2022), Executive Order on America's Supply Chains: A Year of Action and Progress.

The White House (2021), Building Resilient Supply Chains, Revitalising American Manufacturing, and Fostering Broad-Based Growth: 100-Day Reviews under Executive Order 14017.

Thirlwell, M. (2010), "The Return of Geo-economics: Globalisation and National Security", Lowy Institute for International Policy.

Todo, Y., K. Nakajima and P. Matous (2015), "How do supply chain networks affect the resilience of firms to natural disasters? Evidence from the great east Japan Earthquake", Journal of Regional Science, Vol. 55/2, https://doi.org/10.1111/jors.12119.

U.S Department of Commerce (2019), A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals, https://www.commerce.gov/sites/default/files/2020-01/Critical_Minerals_Strategy_Final.pdf.

US Geological Survey (2022), 2022 List of Critical Minerals, https://www.usgs.gov/news/national-news-release/us-geological-survey-releases-2022-list-critical-minerals.

von der Leyen, U. (2022), 2022 State of the Union Address by President von der Leyen, https://ec.europa.eu/commission/presscorner/detail/en/speech_22_5493.

Wiedmann, T. and M. Lenzen (2018), Environmental and social footprints of international trade, https://doi.org/10.1038/s41561-018-0113-9.

WTO (2019), "Global value chains and employment in developing economies", in Global Value Chain Development Report 2019: Technological Innovation, Supply Chain Trade, and Workers in a Globalized World, The World Bank Group, WTO, OECD, Institute of Developing Economies and University of International Economics, https://doi.org/10.30875/503c185b-en.

Xie, L. et al. (2022), "Outsourcing or reshoring? A manufacturer's sourcing strategy in the presence of government subsidy", European Journal of Operational Research, https://doi.org/10.1016/j.ejor.2022.11.003.

Xing, Y. (2022), "China and global value chain restructuring", China Economic Journal, Vol. 15/3, pp. 310-329, https://doi.org/10.1080/17538963.2022.2117198.

Yellen, J. (2022), Special address by US Treasury Secretary Janet L. Yellen, https://www.atlanticcouncil.org/news/transcripts/transcript-us-treasury-secretary-janet-yellen-on-the-next-steps-for-russia-sanctions-and-friend-shoring-supply-chains/ (accessed on 9 January 2023).

3 Country notes

This chapter contains the detailed Going for Growth 2023 country notes for OECD and selected non-member economies. The country notes identify country-specific structural policy priorities to achieve a stronger, more resilient, equitable and sustainable growth going forward. The key structural challenges to be addressed are identified within the Going for Growth framework (Annex 1. A) by OECD Country Desk experts.

ARGENTINA

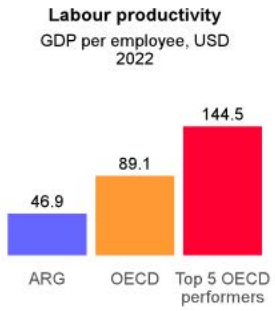
Performance gaps

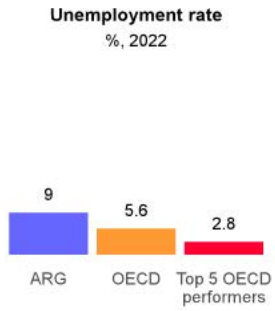
Recommendations

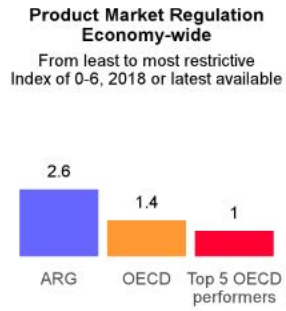
Product and labour markets functioning

- Productivity is low due to a lack of domestic and external competition in many markets. High trade barriers deprive the economy from the benefits of international competition. Product market regulation and administrative barriers restrict market entry and hamper competition.
- Argentina's corporate tax burden is among the highest in the region, and some business taxes are highly distortive.

- Lower trade barriers to reduce the cost of intermediate inputs and capital goods.
- Reduce domestic regulatory barriers to entrepreneurship and market entry, including at the level of provincial and local governments.
- Review business taxation, especially provincial taxes levied on firm turnover rather than income.



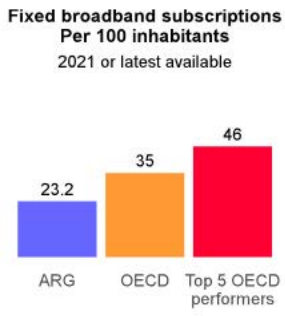


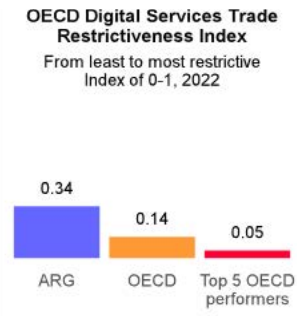


Digital transition

- Argentina has made efforts to enhance digital access and use for all. Internet users, active mobile broadband and fixed broadband subscriptions increased. The country has progressed in the digital transformation of government, but challenges remain in digital inclusion.
- Low student achievements suggest challenges in the quality of education, which hamper building up digital skills. Limited access to quality vocational training exacerbates skill shortages.

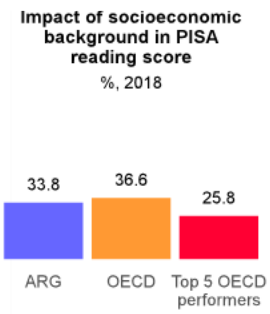
- Improve the quality of public education, including by strengthening teacher training and reducing school dropouts.
- Scale up active labour market programmes with training content, especially those helping to adapt digital skills to the needs of the private sector.
- Enhance the effectiveness of vocational education and training to reduce skill gaps in the labour market.





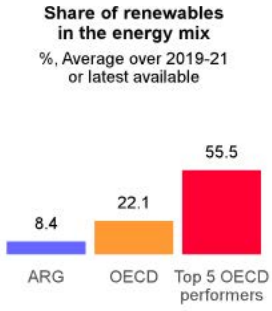
Inclusiveness, social protection, and ageing

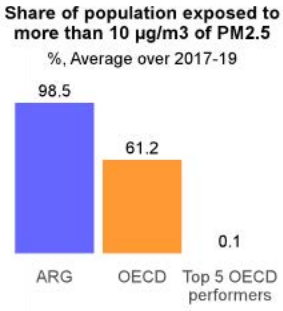
- Poverty is persistently high and extreme poverty has been pushed up by rising inflation. One third of the labour force has an informal job with hardly any social protection, while formal jobs are subject to rigid employment protection legislation and high non-wage labour costs.
- Social spending is biased towards largely regressive energy subsidies, despite the existence of effective cash transfer programmes that could be expanded.
- Quality shortcomings in public education reduce equal opportunities and hamper social mobility.
- Shift the focus of social spending from energy subsidies towards conditional cash transfers. Lower social security contributions for low-income workers to strengthen formal job creation.
- Extend the unemployment insurance scheme with individual accounts used in the construction sector economy-wide while reducing severance costs.
- Improve public spending efficiency in education by merging fragmented teacher training institutions and directing more funds to early childhood and vocational education.

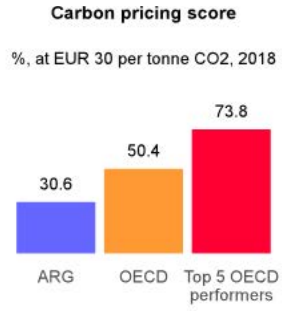


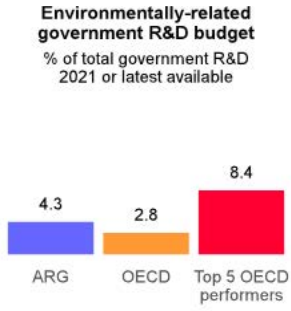
Climate transition

- GHG emissions and deforestation have declined, but more ambitious policies, especially in the development of renewable energy sources, are required. Fossil fuels remain prevalent in energy supply, accounting for 90% of the total.
- Expand renewable energy production and continue developing an automatic early warning system to halt deforestation.
- Implement measures to reduce air pollution, including taxing vehicles according to emissions.

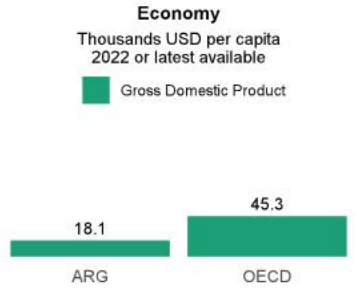


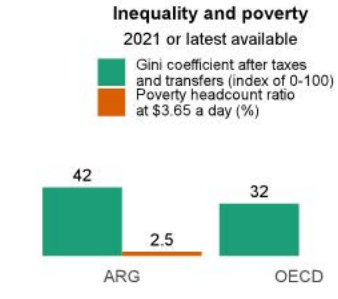


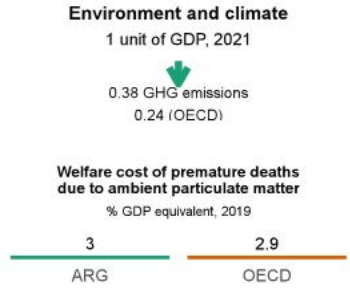




Overall performance







AUSTRALIA

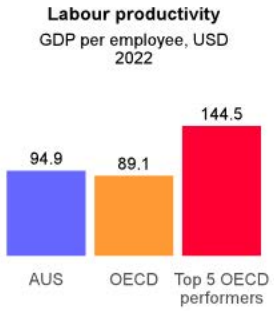
Performance gaps

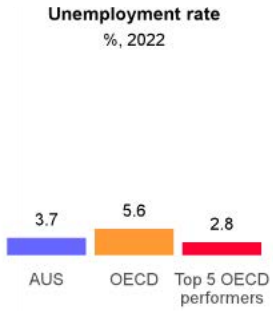
Recommendations

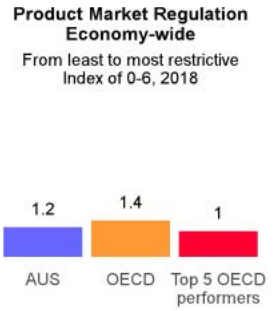
Product and labour markets functioning

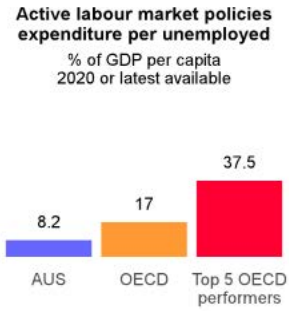
- There are signs of reduced competitive intensity in product markets, as well as falling labour mobility. Productivity growth has also slowed down. Moreover, about one fifth of Australian workers require a license to perform their work, which raises economic costs, including by slowing resource reallocation.

- Legislate automatic mutual recognition of occupational licenses in all states.
- Improve data collection on occupational license regimes across the country and consider avenues for further harmonisation.





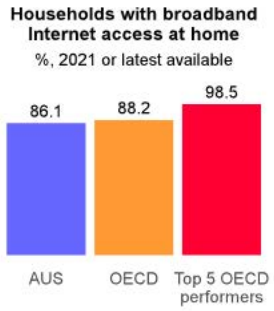


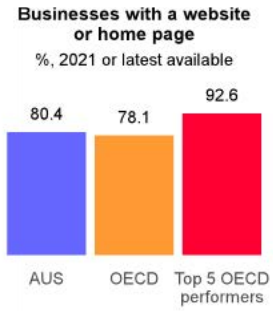


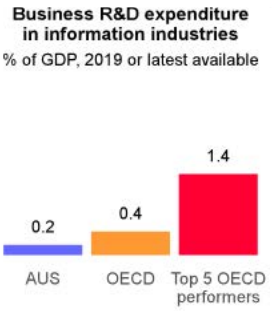
Digital transition

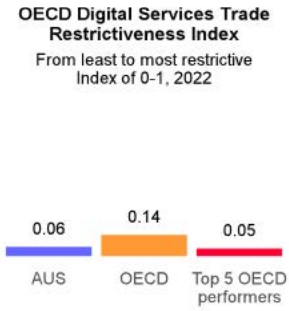
- Access to fast broadband is low compared with other developed countries, while increasing connectivity is key to developing Australia's digital economy.
- The take-up of digital technologies by Australian businesses can also be improved.

- Continue expanding access to fast broadband, including through further investment in the National Broadband Network.
- Expand the Consumer Data Right system to more sectors.



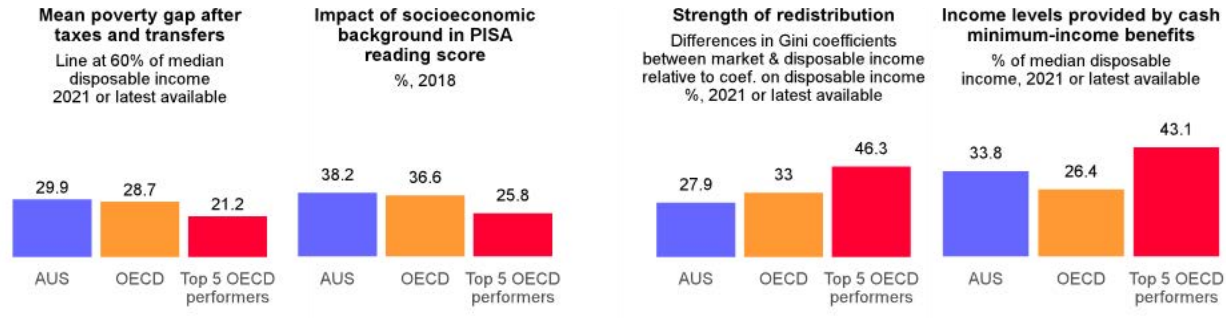






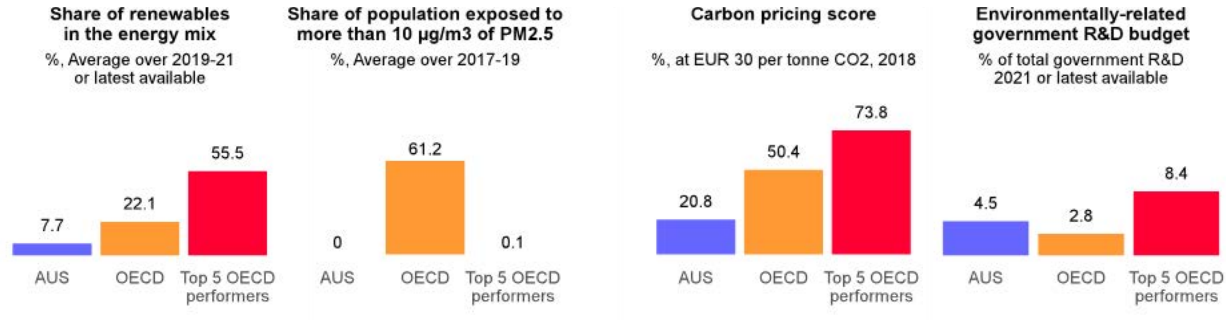
Inclusiveness, social protection, and ageing

- Unemployment benefits replacement rates remain among the lowest in the OECD and below the relative poverty line.
- Gaps in economic and wellbeing between Indigenous and non-Indigenous Australians remain large.
- Consider further increasing the unemployment benefit replacement rates.
- Embed the Productivity Commission Indigenous Evaluation Strategy in the policy design and evaluation process of all Australian Government agencies.

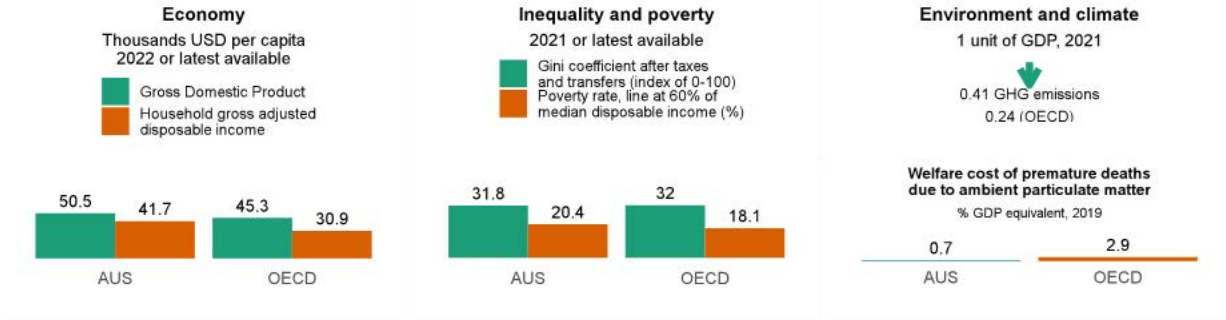


Climate transition

- Australia has pledged to reduce carbon emissions by 43% by 2030 from 2005 levels and to net zero by 2050. National carbon emissions need to decline on a much steeper trajectory if this goal is to be met.
- Develop a national, integrated Long-term Emissions Reduction Strategy with clear goals and corresponding policy settings to achieve climate targets.
- Consider expanding the Safeguard Mechanism, which limits industrial net emissions, to a broader set of economic sectors.



Overall performance



AUSTRIA

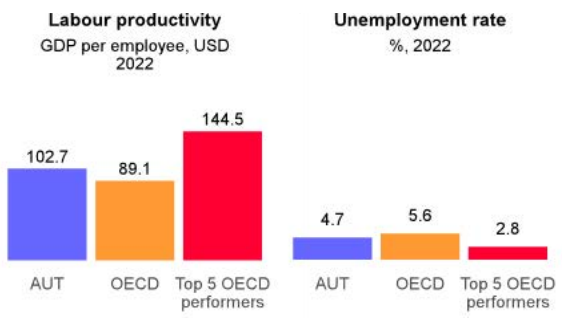
Performance gaps

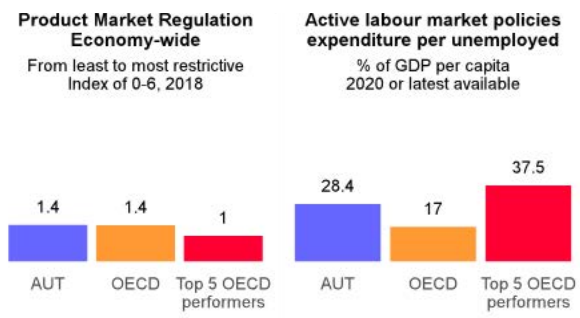
Recommendations

Product and labour markets functioning

- Many professional service sectors have long been sheltered from full competition by regulations, self-regulations and trade and investment protections.
- The share of R&D business in the high-tech sector is low and lags innovation leaders. Public support to R&D is provided mainly through tax incentives.

- Reduce regulatory barriers in entering market services without undermining their quality standards.
- Consider using direct R&D grants to support longer term, higher-risk research.

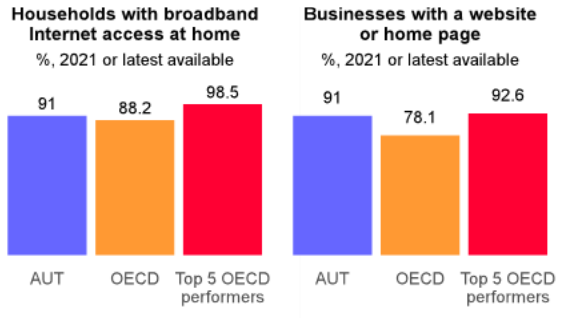


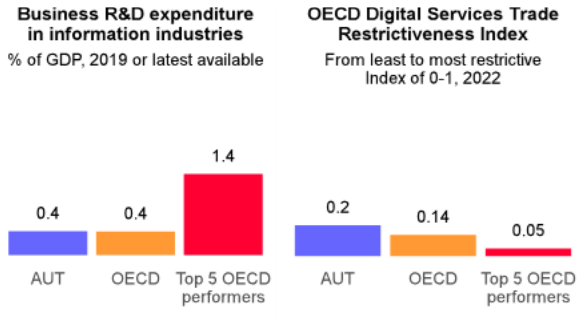


Digital transition

- Austria lags in digitalisation with respect to the top-performing European countries. Fixed broadband coverage, notably at higher speed tiers, is lower than in most other European countries.
- The relative low dynamism of the business sector, and in particular the limited supply of private risk capital, constrains the diffusion of digital technologies.

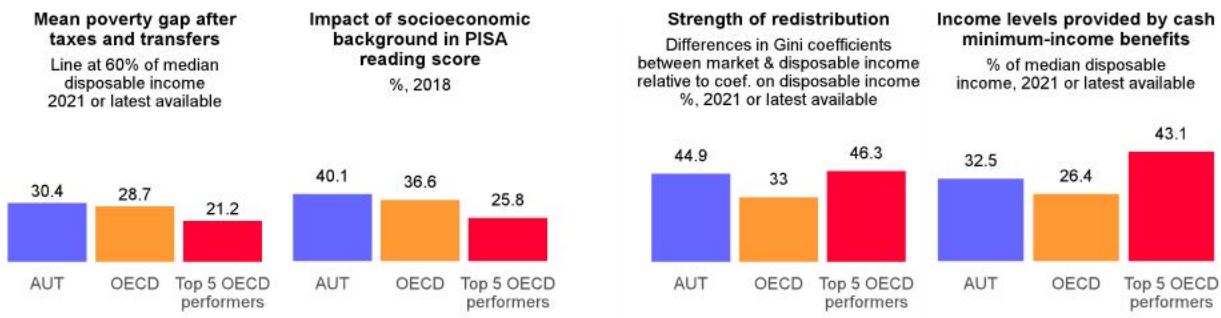
- Increase access to high-quality internet throughout the entire country and achieve the national and EU goal of gigabit connectivity for all households by 2030.
- Improve the effectiveness of start-up and growth financing instruments by avoiding complexity and improving conditions for institutional investors to invest in venture capital, for example by further improving the depth of Austrian capital markets.





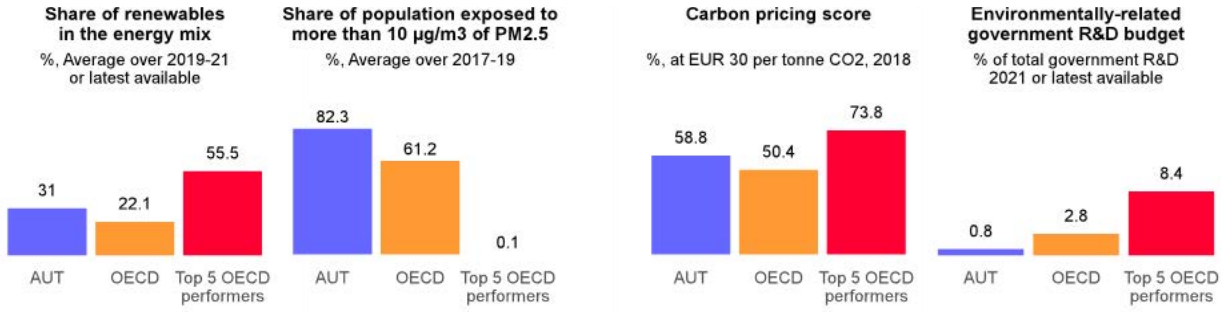
Inclusiveness, social protection, and ageing

- Ageing will reduce the labour force by 5% by 2040 and risks exacerbating the already acute labour shortages. Ageing will also put pressure on the financing of pensions, healthcare and long-term care.
- At the same time, female labour force participation is low, partly reflecting the lack of quality childcare services.
- Ensure the long-term sustainability of the pensions system e.g., by linking the retirement age to life expectancy.
- Reduce early retirement pathways by further reforming the access to disability pensions, improving prevention and rehabilitation measures, and enhancing incentives to continue working at an older age while ensuring good working conditions.
- Bolster the availability and quality of early childcare services throughout the entire territory, in particular in rural areas.

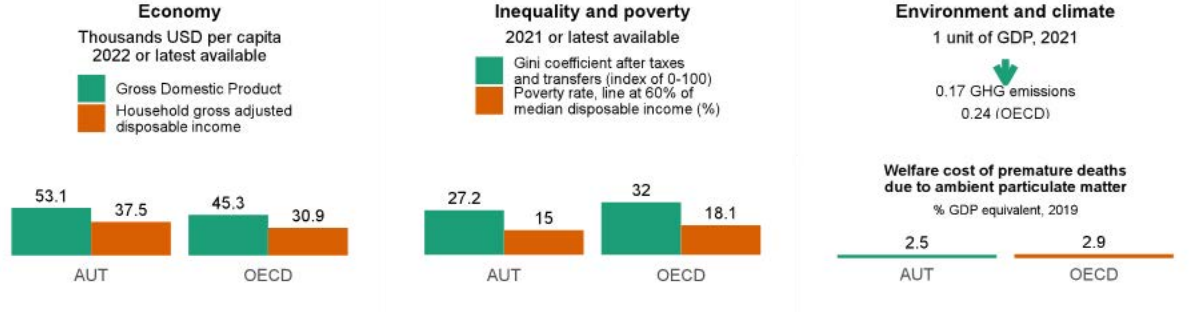


Climate transition

- The carbon intensity of the economy is declining too slowly against the ambitious 2040 climate neutrality goal. The eco-social tax reform 2022 is highly welcome but additional measures will be indispensable, as carbon prices and energy-related taxes will likely remain lower and more uneven than in peer countries, at least for a while.
- Design and implement complementary regulatory and emission saving investment schemes to align the trajectory of emissions with targets.
- Increase and harmonise further carbon prices after 2025 by integrating the largest possible share of emissions in the national and EU emission trading system.
- Eliminate the diesel/gasoline tax gap.



Overall performance



BELGIUM

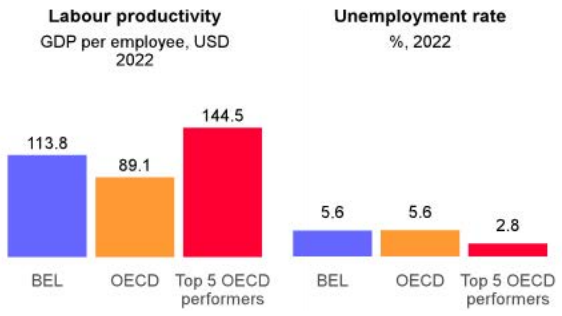
Performance gaps

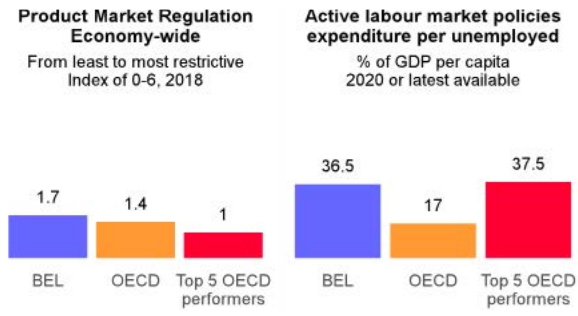
Recommendations

Product and labour markets functioning

- The wage-setting mechanism contributes to low wage inequality but risks hindering job reallocation, thereby lowering productivity growth.
- Automatic wage indexation preserves purchasing power but raises wages faster than in trading partners, weighing on competitiveness in the short run when inflation is high.

- Encourage the use of existing mechanisms within the framework of sector-level agreements to better align wages with productivity at the firm level.
- Make the wage indexation mechanisms more flexible, while ensuring coordination if future evaluations find they fail to take into account the business cycle.

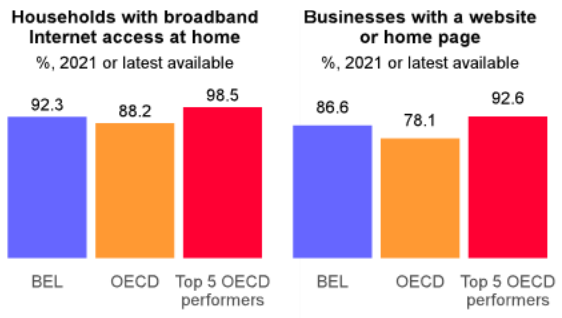


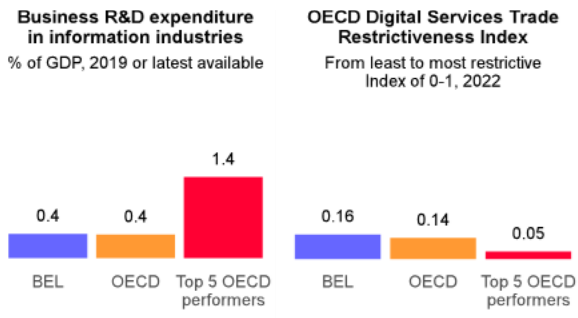


Digital transition

- Firms use digital technologies intensively, but the low share of fibre connections and delayed roll-out of 5G limit future adoption. High broadband prices and market concentration could reflect weak competition in the communication sector.
- There is scope to digitalise the public sector further.

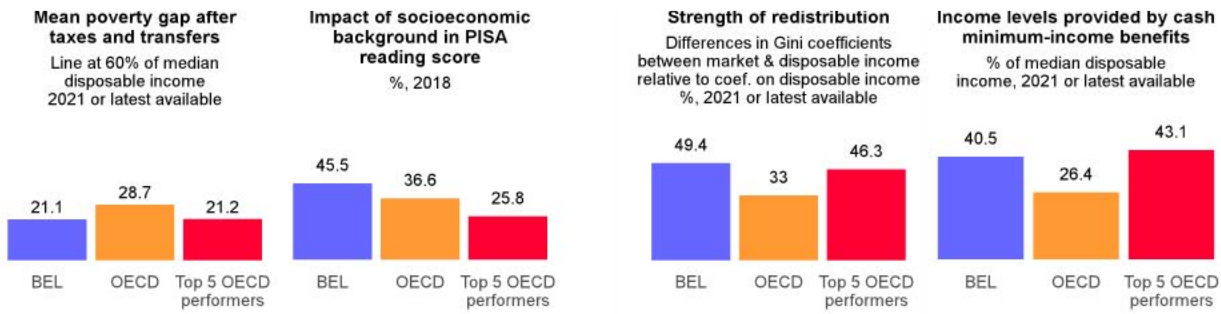
- Remove the barriers that can delay broadband network and 5G deployment, including strict limits on electromagnetic fields and slow delivery of permits.
- Facilitate consumer mobility across service providers.
- Prioritise providing the public sector with digital skills to better use and develop digital tools. Promote coherence of digital strategies across different levels of government.





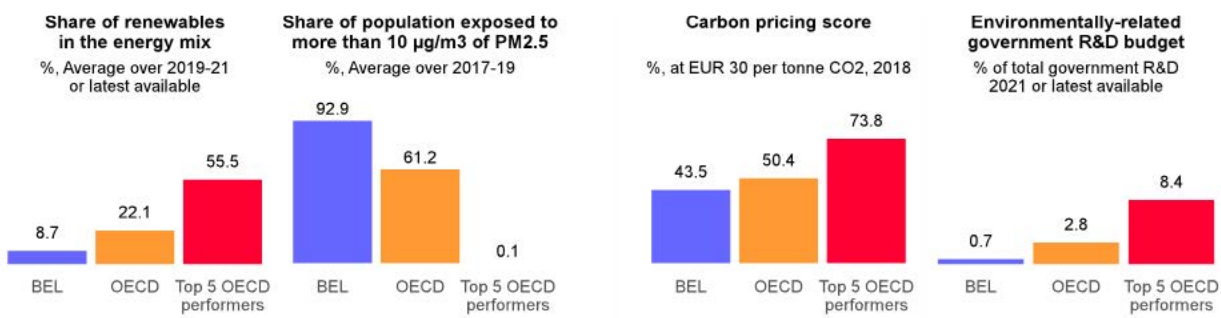
Inclusiveness, social protection, and ageing

- Belgian students' overall performance is on par with peer countries, but individuals' achievements strongly depend on their socio-economic backgrounds.
- Participation in lifelong learning is limited for the low educated, low-income groups and those with disabilities, accounting in part for low employment rates and labour mobility.
- Improve teachers' incentives to work in disadvantaged schools. Better link school funding with educational outcomes for disadvantaged students.
- Streamline lifelong learning programmes and prioritise vulnerable groups for face-to-face career guidance.

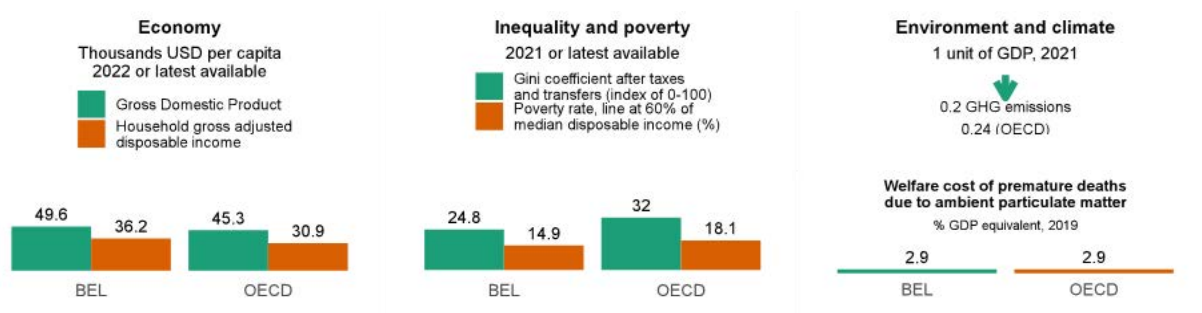


Climate transition

- Belgium makes no use of explicit carbon taxation beyond the EU Emissions Trading System. Fossil-fuel consumption is encouraged by moderate taxation and widespread subsidies.
- The coherence of regional and federal policies in the national energy and climate plan can be improved substantially.
- Introduce a carbon tax for sectors not subject to the EU Emission Trading Scheme and develop compensatory measures for vulnerable households.
- Present an integrated national overview of the federal and regional climate plans and define how efforts to reach the 2030 climate objectives should be shared.



Overall performance



BRAZIL

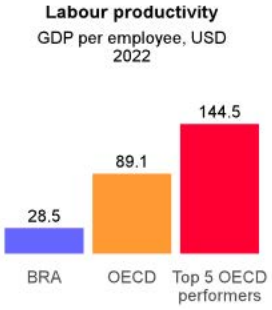
Performance gaps

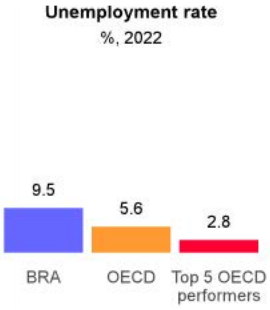
Recommendations

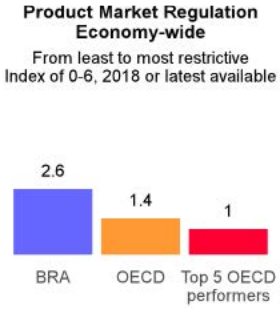
Product and labour markets functioning

- Trade barriers remain high and trade facilitation could make further progress. Competition by foreign companies is limited by high import tariffs in addition to non-tariff barriers, including local content requirements.
- Regulatory barriers to competition in six regulated professions including accountants, architects, civil engineers, real estate agents, lawyers, and notaries remain high. These barriers include constraints on the legal form that firms can take in these sectors and give professional associations ample powers in defining market access and price floors.
- The quality of education is low and vocational training underdeveloped.

- Reduce tariff and non-tariff barriers, starting with capital goods and intermediate inputs, and further digitalise and streamline trade formalities.
- Further limit the role of professional associations in setting prices and limiting the scope of entry in regulated professions.
- Perform a competition assessment to determine whether the regulatory constraints imposed on professionals are effectively necessary.
- Scale up resources for professional training courses to close skills gaps and improve integration into the labour market.



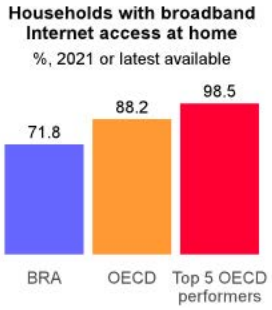


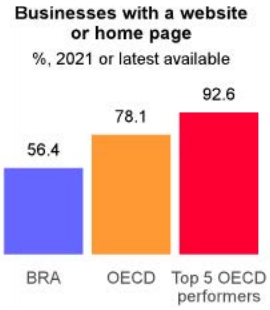


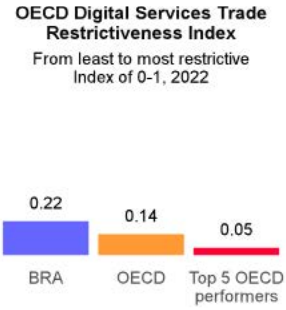
Digital transition

- Use of internet has increased to 80% of the population in 2020. E-commerce has also expanded during the pandemic, boosted by the introduction of the instant-payments system operated by the central bank. Nonetheless, access to fixed broadband remains limited to 17% of population.

- Boost public investment to better support coverage of broadband internet connections, including subsidising last-mile rollout.
- Continue the development of e-government services and the integration of subnational governments in the federal platform.

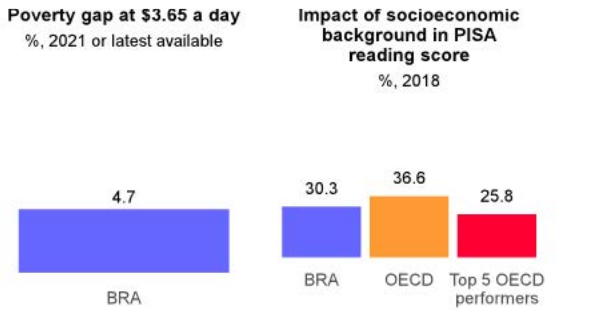






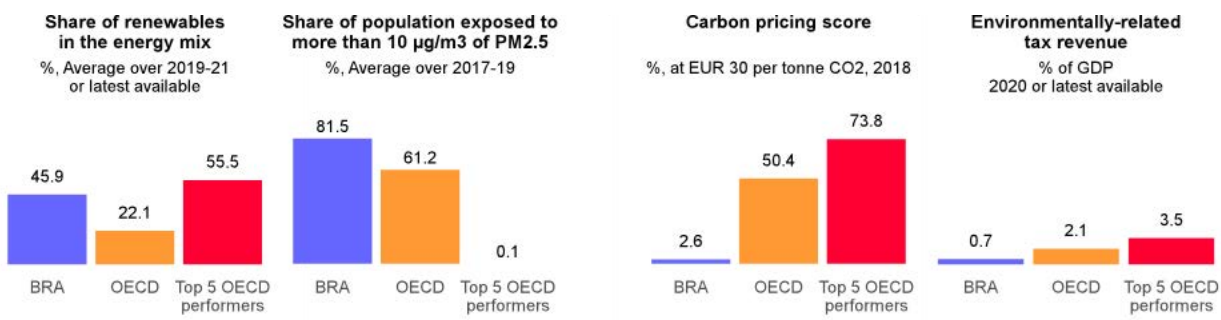
Inclusiveness, social protection, and ageing

- Despite the recent increase of the level of cash transfers and an extension of coverage, poverty remains high and inequality is far higher than in any OECD country.
- High labour market informality contributes to low and unstable incomes for many vulnerable workers with limited professional qualifications.
- Strengthen the focus of social spending on those benefits that effectively target low-income households.
- Further expand access to early-childhood education to improve equal opportunities and allow more mothers to seek gainful employment.
- Improve the quality of primary and secondary education to reduce the skills gap.

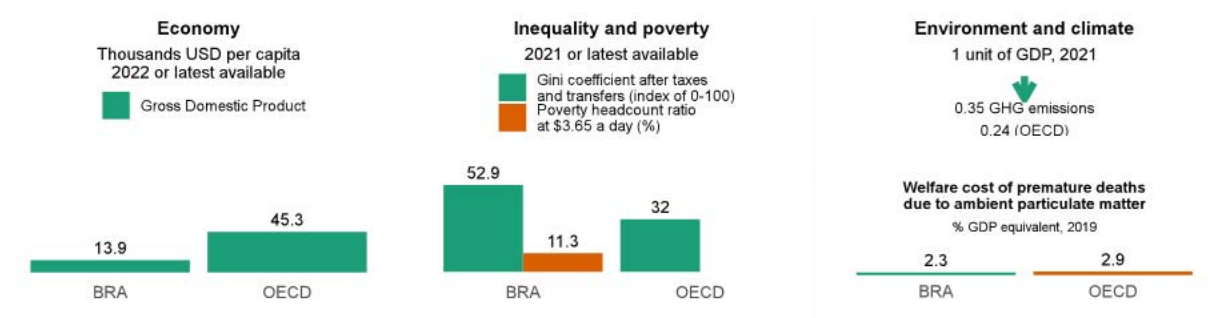


Climate transition

- Carbon dioxide emissions from fuel combustion are relatively low as around 45% of energy is sourced from renewables. However, deforestation has increased dramatically in the past three years, raising emissions and reducing the sequestration capacity of the forest.
- Better enforce the existing legal protection framework to combat illegal deforestation and ensure adequate staffing and budget of environmental enforcement agencies.
- Further diversify the sources of electricity by developing wind and solar sources to limit the dependence on hydroelectric energy.



Overall performance



BULGARIA

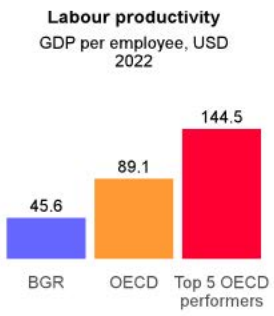
Performance gaps

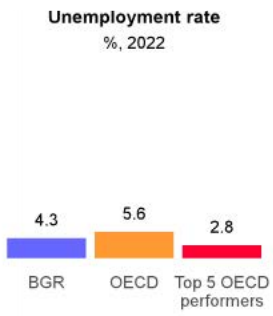
Recommendations

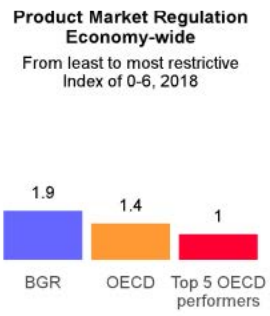
Markets functioning

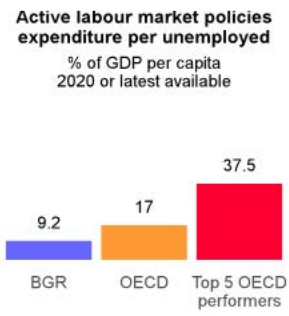
- Administrative burdens and corruption still damp business activity and impede competition.
- Strengthening labour productivity from currently low levels will become an increasingly pressing concern for the labour market given persistent labour shortages amid a shrinking workforce. Training and re-skilling will play an important role to prepare workers for the green and digital transitions.

- Introduce a simplified procedure for the liquidation of SMEs.
- Extend the authority of bodies to detect and investigate corruption to cover the entire economy.
- Increase transparency of the selection of all board members and managers of SOEs by strengthening the merit-based and competitive process.
- Intensify cooperation between local authorities and the private sector to extend workplace-based vocational training across the country.





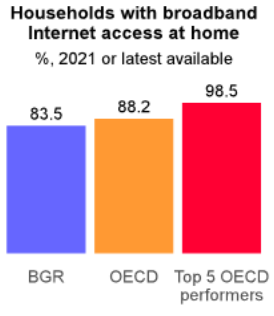




Digital transition

- The ICT sector is an important source of growth and value added with high labour productivity, but it is suffering from severe labour shortages. Attracting and qualifying more skilled workers is required, in addition to supporting SMEs to bridge the digital divide and master the ongoing transformation.

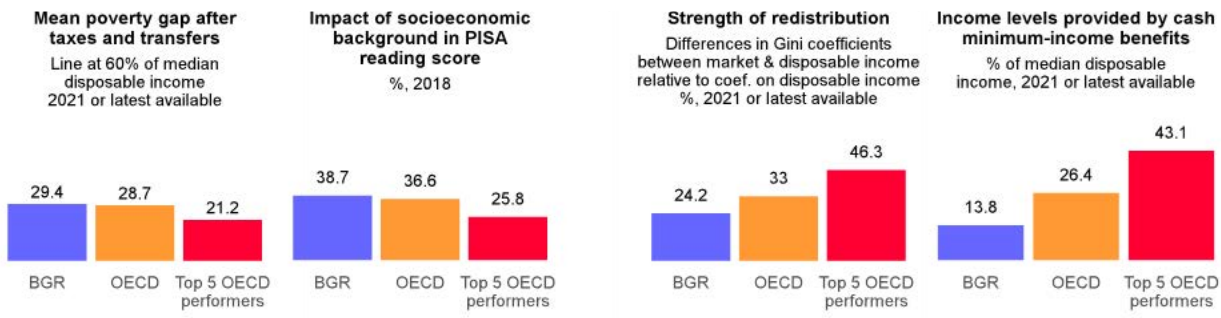
- Extend broadband penetration.
- Broaden support to non-high-tech firms that have difficulties accessing platforms and lack knowledge resources.
- Align adult training with employers' skill needs through skill assessments that enter official training curricula.



Inclusiveness, social protection, and ageing

- Bulgaria has one of the fastest ageing societies in the world, leading to growing spending needs for health and elderly care. This puts additional pressure on the social security system, already under pressure to provide adequate transfers and services to avoid poverty and support activation.

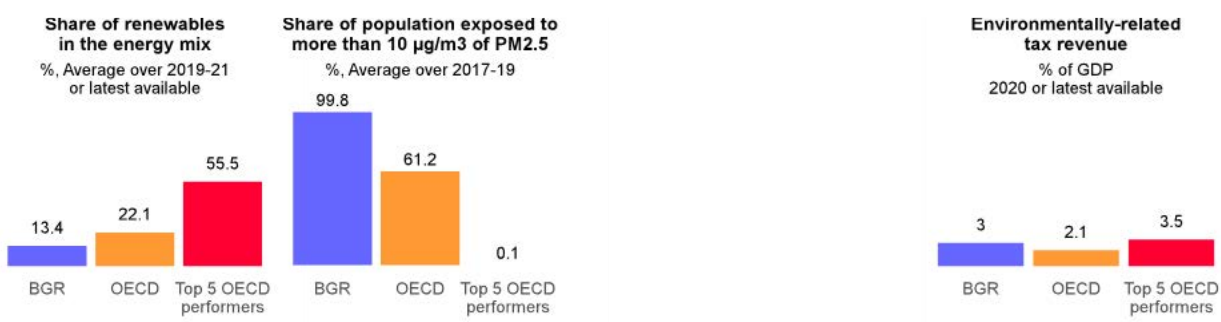
- Overhaul the social welfare system to provide better social support, stepping up existing efforts to gradually increase benefits to approach the poverty line, while improving activation.
- Increase incentives to register with the Employment Agency, including improved training and consider providing minimum (social) health coverage for people who register.
- Increase the number of returning former emigrants to enlarge the labour force by strengthening outreach to the Bulgarian diaspora.



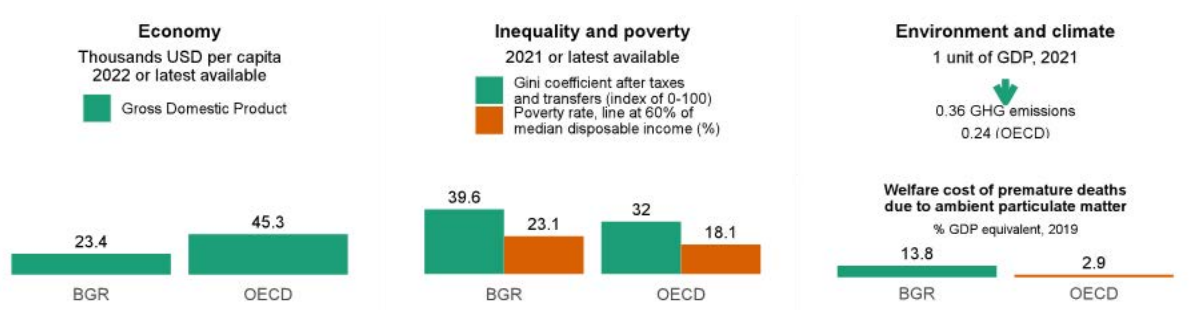
Climate change

- The Bulgarian economy is highly energy intensive. Investments in, and installations of, renewable energy sources need to increase, in particular solar and wind, where the country has high potential. The phasing out of coal, which is still a major energy source, will be challenging for some regions that strongly rely on coal mining.

- Accelerate the rolling out of renewables to better harness their potential and ensure the meeting of net zero commitments.
- Complete an overarching strategy for the climate transition with a roadmap and policies to achieve zero net emissions.
- Delink land ownership rights of the property where small-scale renewable energy generators are planned as long as a long-term lease is secured. Introduce a scheme where producers can sell any self-generated unused electricity to the supplier through the grid.



Overall performance



CANADA

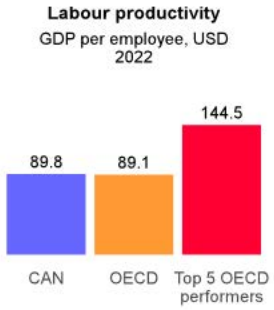
Performance gaps

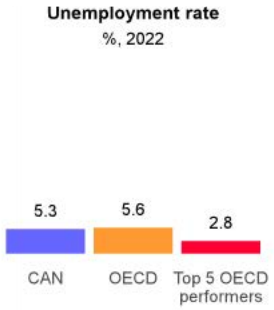
Recommendations

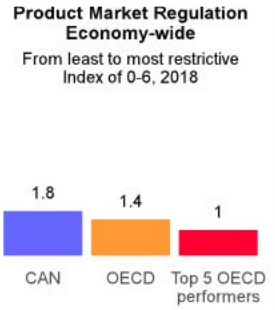
Product and labour markets functioning

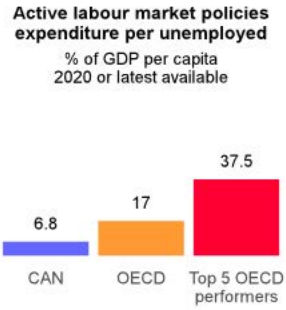
- Canada's productivity growth continues to underperform leading OECD countries. Differences in provincial regulation of markets for goods, services and labour obstruct internal trade and hinder business activity.
- Canada has lagged other OECD countries in adjusting competition laws for large producers of digital services. Tax breaks for small enterprises discourage high-performing firms from growing, weighing on productivity growth.

- Continue lowering internal barriers to trade, including through widening the scope of the Canadian Free Trade Agreement.
- Work on measures to prevent anti-competitive behavior by large digital enterprises.
- Remove tax subsidies for small firms, including by lowering the small firm tax-credit rate to that for large firms in the Scientific Research and Experimental Development Program.





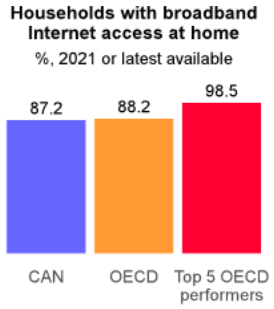


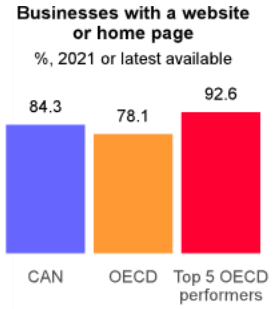


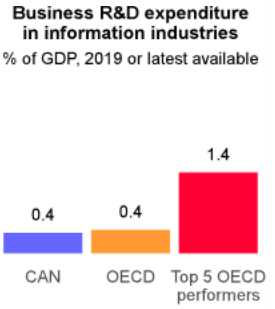
Digital transition

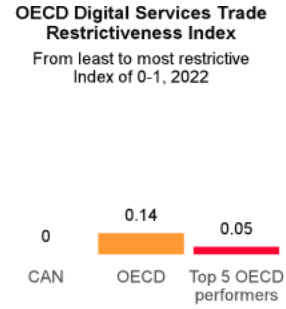
- Stronger competition among telecoms providers could reduce prices and improve network quality.
- Poor access to broadband internet in some communities impedes activity and opportunities outside Canada's cities.

- Widen market access for mobile virtual network operators and pare back foreign-ownership restrictions.
- Improve telecommunications services in rural and remote communities.



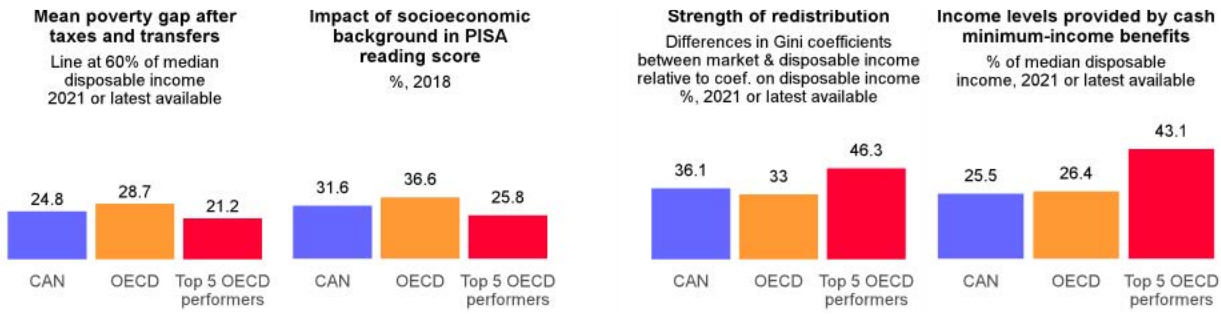






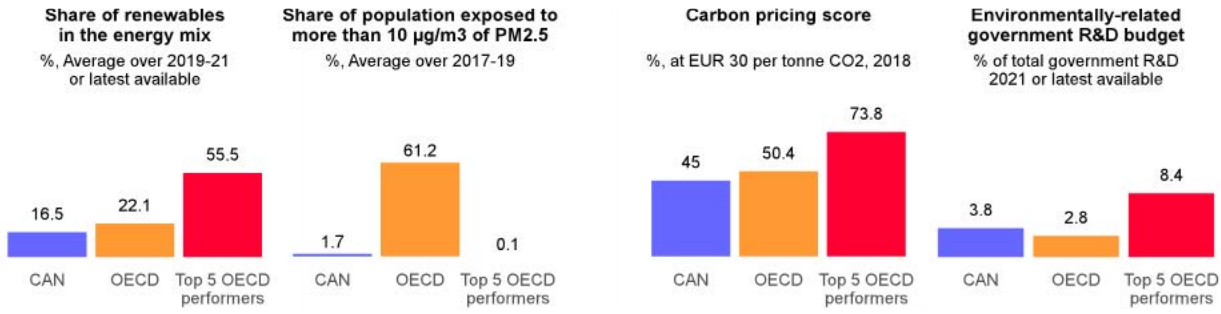
Inclusiveness, social protection, and ageing

- Inadequate access to affordable childcare impedes female labour force participation and gender equality.
- Canada has experienced large increases in housing prices in recent years, making it harder for many Canadians to buy homes, particularly in cities.
- Large socio-economic gaps remain between Indigenous people and the non-Indigenous population.
- Canada's public health-care system does not cover pharmaceutical drugs at the national level. High-priced medicines can further stretch the budgets of vulnerable low-income households.
- Monitor and, where necessary, support provinces' and territories' delivery of lower cost childcare following deals struck with the Federal government.
- As part of efforts to improve housing affordability, work with sub-national governments to lower barriers to supply of housing in urban areas.
- Enhance self-determination among Indigenous peoples including through capacity building in Indigenous governments.
- Follow through with planned negotiations for gradual adoption of universal drug coverage (Pharmacare).

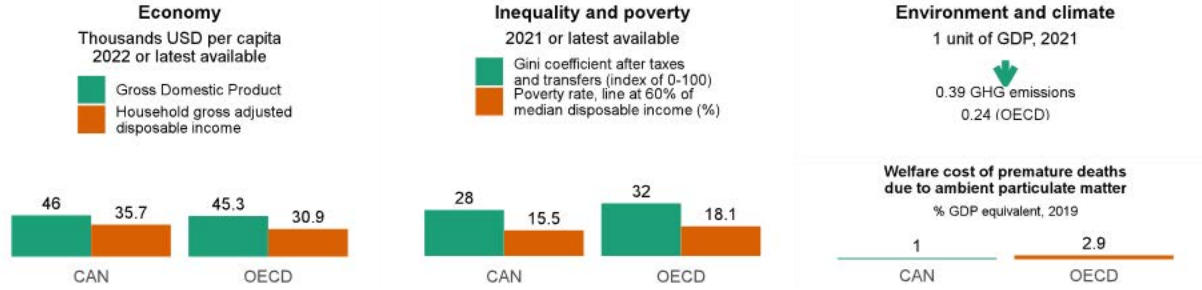


Climate transition

- Canada's economy generates more emissions per person than most OECD economies. Deep abatement will require a large shift to clean energy and more efficient energy use.
- Incentives are too weak in some provinces' carbon pricing schemes to ensure Canada hits its emissions targets. Exclusion of some emissions sources reduces the efficiency of the national carbon pricing framework.
- Electricity pricing policies in some provincial power markets encourage heavy energy use and reduce returns to investment in green energy.
- High take-up of zero emission vehicles is needed to drive down emissions from passenger transport.
- Proceed with planned carbon price rises and continued tightening of emissions benchmarks.
- Continue to improve methods for tracking methane emitted from oil and gas operations with a view to including methane in emissions pricing schemes.
- Encourage time-of-use pricing as a default option for residential customers in provincial electricity markets.
- Continue support for increased domestic power trade to boost competition, facilitate market-based pricing, and lower the cost of decarbonising electricity.
- Maintain support for EV charging infrastructure rollout while markets are still maturing.



Overall performance



CHILE

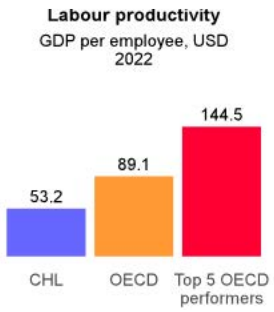
Performance gaps

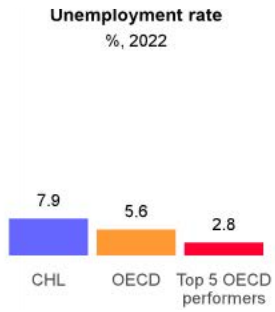
Recommendations

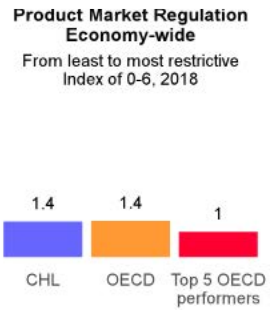
Product and labour markets functioning

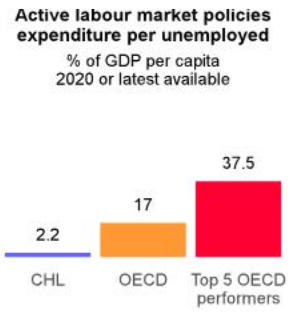
- Low competitive pressures in several sectors contribute to weaken productivity. Even though Chile's regulatory requirements on product markets are slightly less restrictive than the OECD average, lengthy and complex regulations and licensing procedures, particularly at the municipal level, hamper entrepreneurship and competition.

- Streamline and unify municipal licensing procedures and foster the digitalisation of relevant procedures.
- Ensure an adequate budget for the Competition Authority for the funding of market studies.





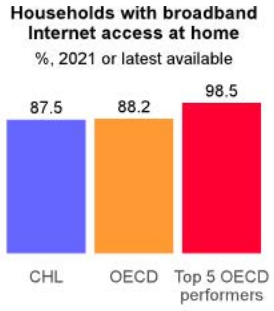


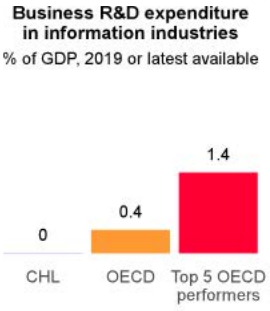


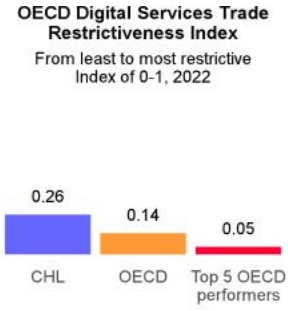
Digital transition

- High-speed fixed broadband penetration is low compared to the OECD average, with large disparities between rural and urban areas. Regulation on concessions in the communication sector is burdensome.
- SMEs lag in the adoption and use of digital tools, and in R&D and innovation expenditure.

- Lower entry barriers to the communication sector by replacing the existing regulation for concessions.
- Set provisions for passive communication infrastructure sharing and establish clear criteria regulating rights of way for deployment.
- Boost public support to SMEs through targeted programmes to facilitate the adoption of digital tools.



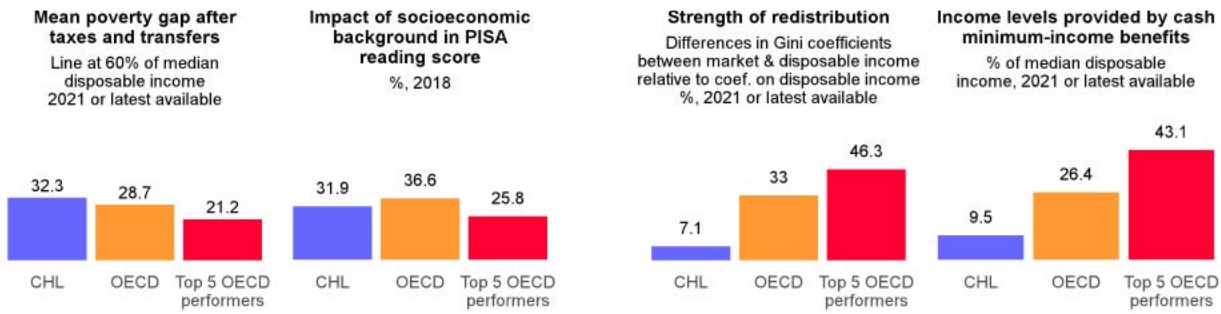




Inclusiveness, social protection, and ageing

- Many middle-income Chileans have inadequate old-age pension levels.
- Higher mandatory contributions raise the cost of formal job creation, driving many low-skilled workers into informality.
- There are gaps in social protection, particularly for informal workers, and income-support programmes are very fragmented.

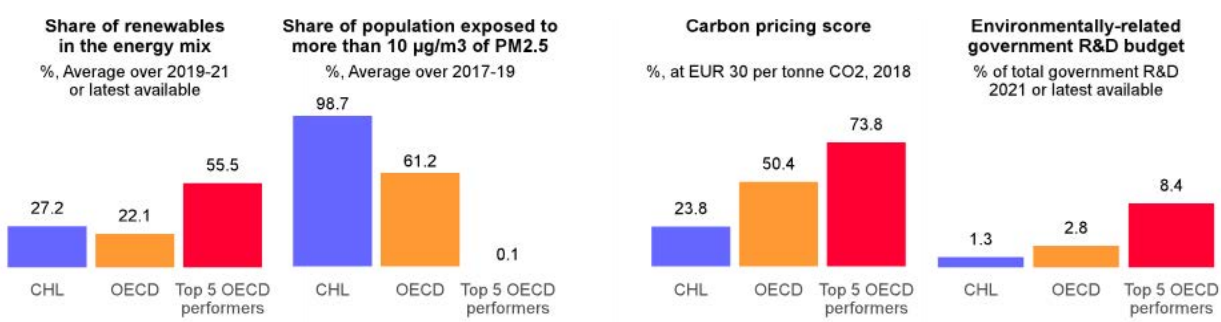
- Consider raising pension levels and applying a progressive contribution rate schedule, ensuring strong incentives for formal job creation.
- Establish a comprehensive strategy to foster formalization that includes lowering non-wage labour costs, improving skills, and strengthening the tax administration.
- Merge current cash transfer programmes into a single conditional guaranteed minimum-income scheme.



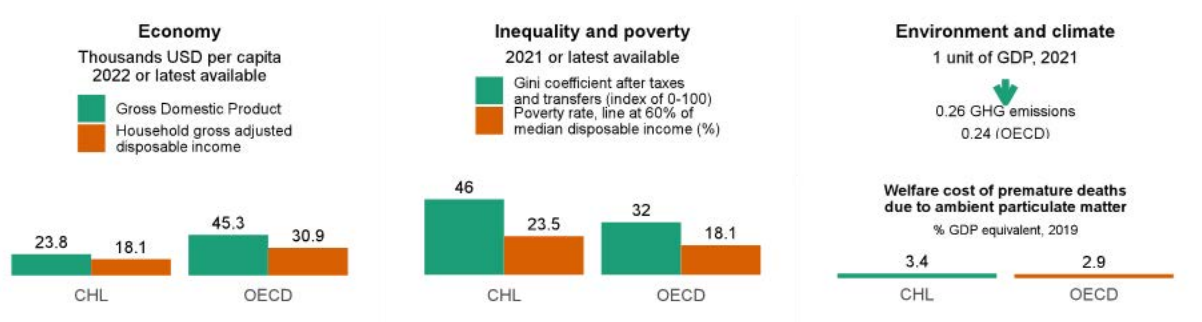
Climate transition

- Despite high potential for production of renewable energy, coal combustion is still a major source of electricity. The share of electricity generated from renewable sources is just 47%.
- The level of the carbon tax is low, does not promote renewable energy sources and hampers the development of an emission-trading scheme.

- Use carbon taxes and cap and trade systems to accelerate decarbonisation, while protecting the purchasing power of vulnerable households with policies like targeted cash transfers instead of price subsidies.
- Consider accelerating exemptions from the carbon tax for power plants that use renewable energy sources.



Overall performance



CHINA

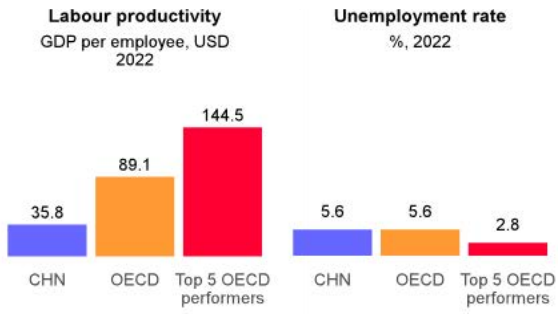
Performance gaps

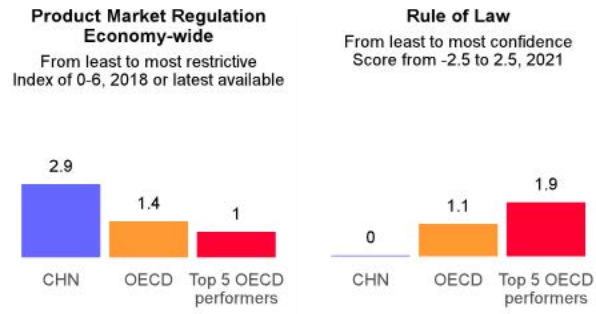
Recommendations

Product and labour markets functioning

- Local protectionism - mostly manifest in the form of administrative monopolies - inhibits fair competition across sectors and across regions.
- State-owned enterprises and other public entities benefit from implicit guarantees.

- Strengthen the rule of law and restrict the power of administrative departments to prevent the creation of administrative monopolies and dismantle existing ones by applying the Fair Competition Review mechanism rigorously.
- Gradually phase out implicit guarantees to SOEs and other public entities by not bailing them out upon their default.

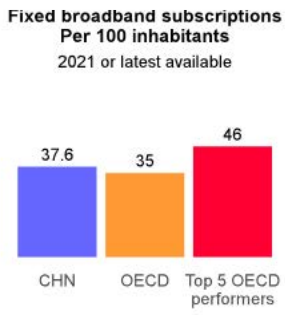


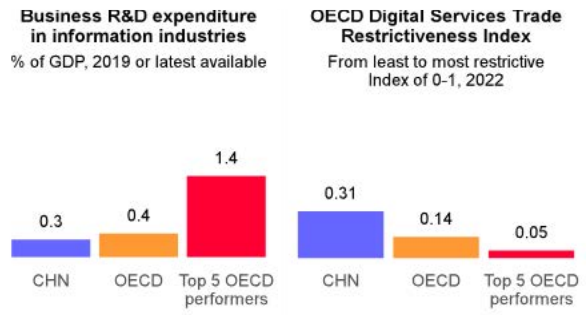


Digital transition

- China has leapfrogged and became a world leader in a number of digital services such as e-commerce, online payments and digital car hailing but the digital divide between coastal and inland regions as well as in skills is large.
- The greatest skill deficit is in computer programming among major skill categories.

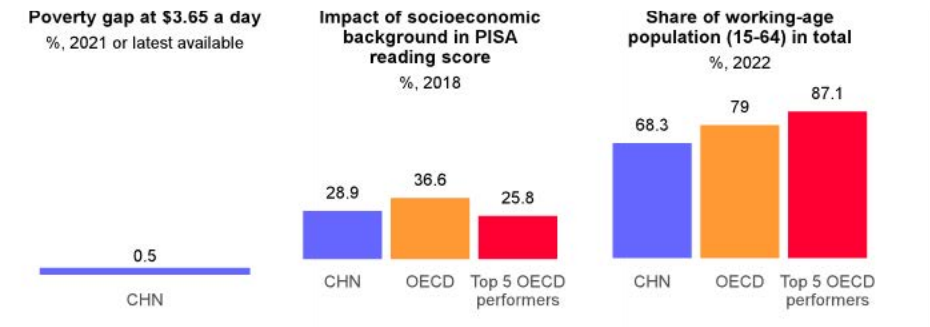
- Increase internet penetration and extend e-commerce and other services in inland and rural areas.
- Strengthen basic literacy, numeracy and computer programming skills starting from the primary level and in adult learning.





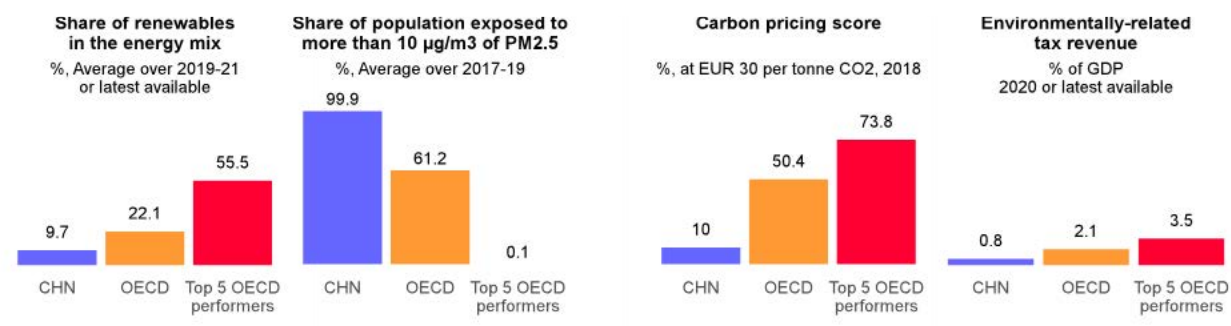
Inclusiveness, social protection, and ageing

- The working age population has been falling for a decade and the overall population has peaked.
- Pension coverage is incomplete, and the share of out-of-pocket health costs is high.
- Provide equal opportunities by ensuring a minimum quality of public services across the country and centralising such spending to ensure provision.
- Link the retirement age to life expectancy, unify pensions, make the system more redistributive and increase the coverage of reimbursed treatments.

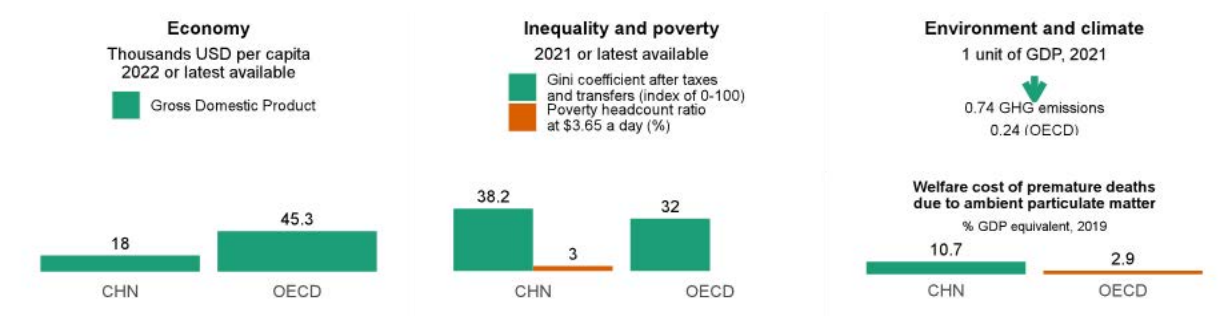


Climate transition

- Renewables prices have successfully been reduced and subsidies are being phased out, but extreme weather adversely impacts the green transition.
- Pollution keeps taking a heavy toll on human lives.
- Halt the construction of new coal-fired power plants, raise environmental taxes on fossil fuels and strengthen climate mitigation action.
- Allow renewables producers to sell the electricity they produce through the grid.



Overall performance



COLOMBIA

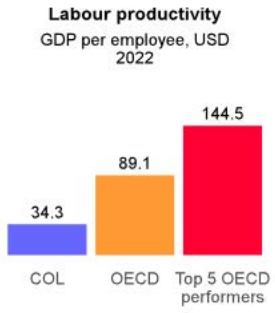
Performance gaps

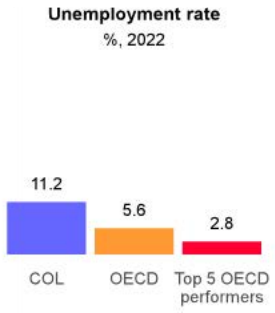
Recommendations

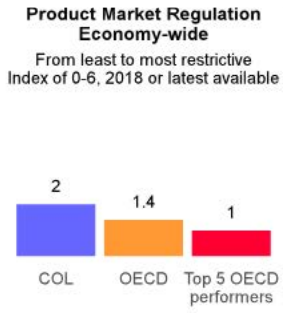
Product and labour markets functioning

- Productivity growth has fallen behind regional peers and competition is weak. Regulations in product markets, administrative barriers, and high business registration costs restrict market entry of formal firms and hamper competition.
- Low trade openness affords high protection to some domestic producers, often characterised by low productivity.
- Courts are slow to resolve civil disputes and enforce contracts.

- Reduce domestic regulatory barriers to entrepreneurship and market entry.
- Reduce tariff and non-tariff barriers to trade, starting with those items where current barriers are highest.
- Strengthen the performance of the judicial system by enhancing court automation and electronic case management tools and reducing adjournments.



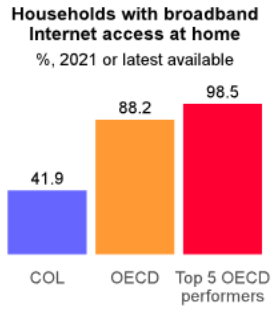


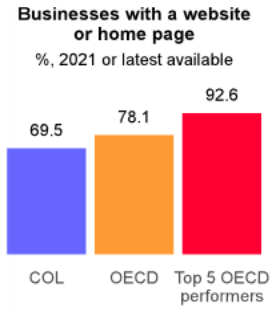


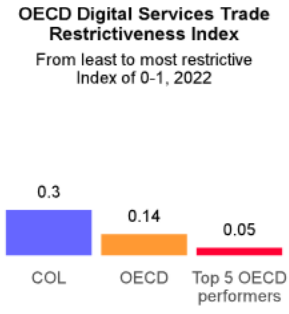
Digital transition

- Colombia has one of the lowest fixed and mobile broadband penetration rates in the OECD, with lower average speed and higher prices. Socio-economic divides in the use of digital tools are large.
- Digitalisation of the public sector and the strategic use of data for decision-making by authorities lags behind.

- Better target public funding for public internet centres in poor and remote communities.
- Ensure adoption of the recent Digital Government Policy to improve job matching, education choices, reduce compliance costs for firms, and speed up customs procedures.

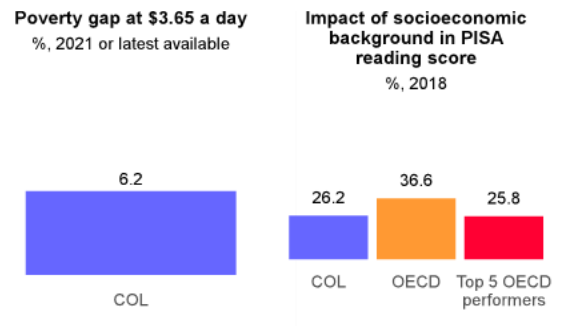






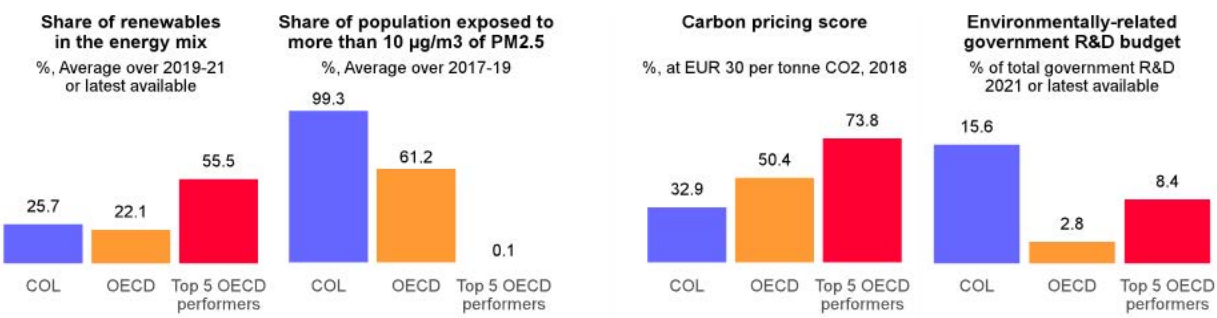
Inclusiveness, social protection, and ageing

- The pandemic has highlighted major gaps in social protection, leaving around 40% of the population in absolute poverty (according to the national definition). Income-support programmes are highly fragmented.
- Informality, which affects 60% of the workforce, precludes workers from access to social security benefits such as pensions, which disproportionally benefit the better off. High charges on formal labour sustains labour informality.
- Merge existing cash transfer schemes into a single cash benefit for poor households while maintaining conditionalities for households.
- Establish a comprehensive strategy to foster formalisation, including lower non-wage costs, stronger enforcement, and improvements in tax administration.
- Reduce the tax burden on formal labour income by gradually shifting the financing burden of social protection towards general taxation, particularly by broadening the base of the personal income tax.

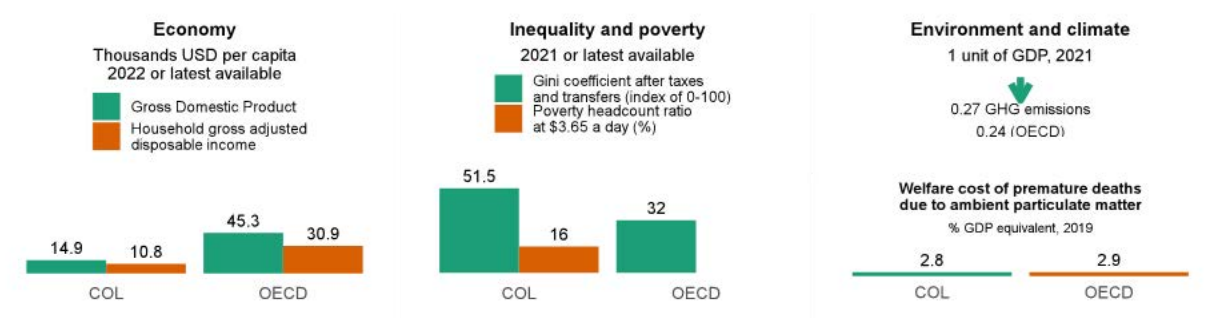


Climate transition

- Deforestation of the Amazon and other green areas has risen and reaching current objectives for reducing greenhouse gas emission will require stronger declines in deforestation.
- Cadastral information is outdated, land informality is high, and a patchy land registry encourages opportunistic deforestation.
- Increase resources dedicated to anti-deforestation enforcement activities to follow up on more cases of detected deforestation.
- Accelerate progress in expanding the land registry, especially into remote areas.



Overall performance



COSTA RICA

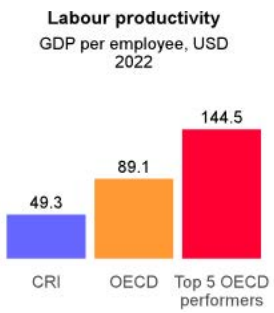
Performance gaps

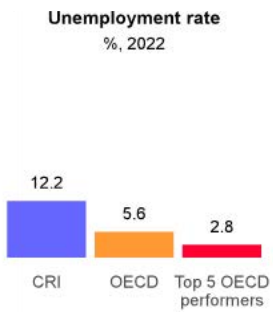
Recommendations

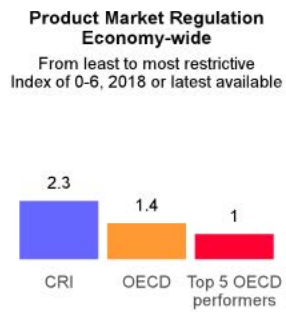
Product and labour markets functioning

- Regulations do not take into account their impact on competition. The national competition authority remains severely under resourced, which hinders its potential to improve regulations and open up key markets that would translate into lower prices for households and lower costs for firms.
- Female labour market participation is hampered by care responsibilities, particularly in low-income families as children from disadvantaged households have lower access to early education.
- The number of STEM graduates does not meet labour market demand. University funding mechanisms lack incentives for accountability and quality in education and research.

- Provide the national competition authority with the financing set in the law.
- Conduct regulatory impact assessments when developing new regulations.
- Expand the coverage of early education for children below four years, giving priority to low-income families and using co-payment mechanisms.
- Modify universities funding mechanisms by linking additional funding for public institutions to system-wide performance goals such as increasing STEM programmes and the number of graduates.



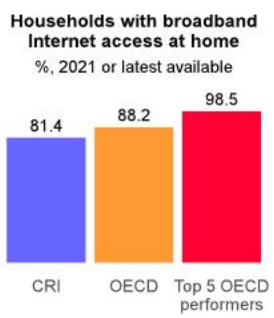


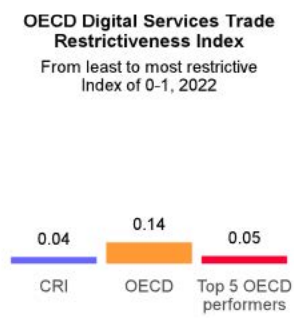


Digital transition

- Costa Rica has made progress in mobile internet connectivity but lags in fixed broadband penetration, whose subscriptions are expensive. Excessive regulation, especially at the municipal level, causes high regulatory barriers to e-communications, hindering infrastructure deployment. Costa Rica also lags in the deployment of its 5G network.

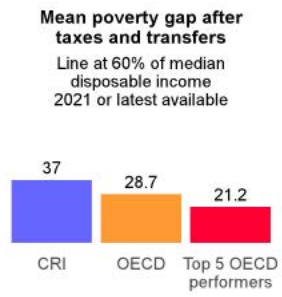
- Streamline and harmonise regulations to facilitate infrastructure deployment and lower entry barriers for new operators.
- License the 5G spectrum through a transparent concession process.

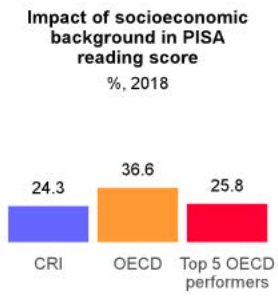




Inclusiveness, social protection, and ageing

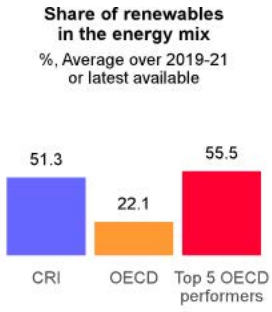
- The poverty rate has remained largely unchanged while inequality has trended up over the last 25 years. With unemployment rate above 10%, female labour force participation rate below the OECD average and informality affecting nearly half of employment, there is a need for reforms to improve education, training policies equality of opportunities and to reduce gender inequalities.
- Around 30% of individuals older than 65 have no pension and significant demographic changes ahead require reforms to buttress the pension system.
- Several social programmes also suffer from mistargeting.
- Link the statutory retirement age to increases in life expectancy to improve the sustainability of the pension system.
- Introduce a universal pension covering to reduce old-age poverty.
- Reduce the fragmentation of social programmes while improving targeting.
- Reduce social security charges for low-income workers. Eliminate payroll charges not allocated to finance social security.

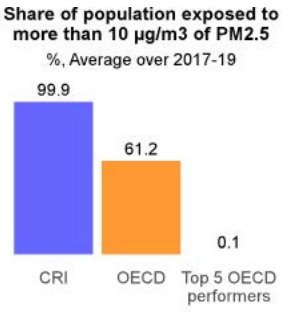


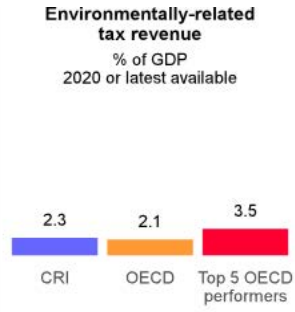


Climate transition

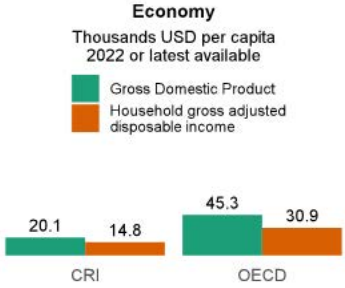
- The level of GHG emission in Costa Rica is low by international standards, but it is rising due to the increase of private vehicle use. With almost 100% of the country's electricity mix stemming from renewable sources, emissions from the transport should be reduced to achieve the goal of net-zero emissions by 2050.
- The funding of the Payment of Environmental Services scheme should be changed to continue to support reforestation.
- Align taxes on vehicles with their emissions to encourage a shift towards less polluting vehicles.
- Update toll fees to ensure they reflect the cost of road use and introduce congestion charges.
- Broaden the sources of financing of the Payment for Environmental Services scheme, currently based on fuel tax revenues and will fall overtime.
- Harmonise and gradually increase the carbon tax rate once high energy prices start falling, and channel part of the revenues towards low-income households.

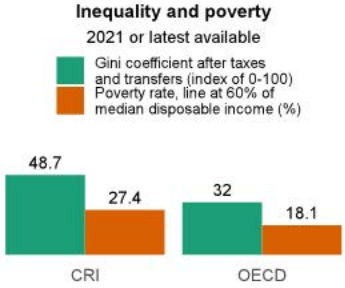


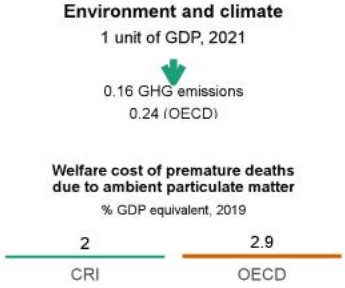




Overall performance







CROATIA

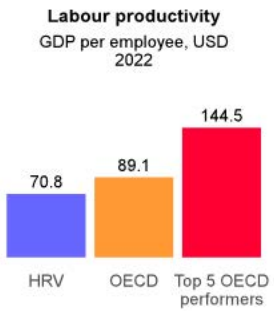
Performance gaps

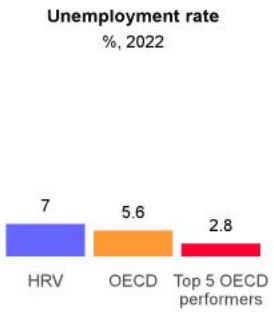
Recommendations

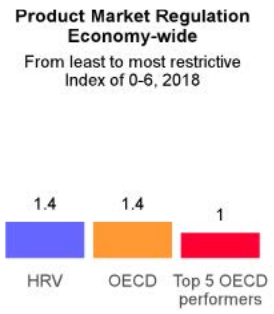
Product and labour markets functioning

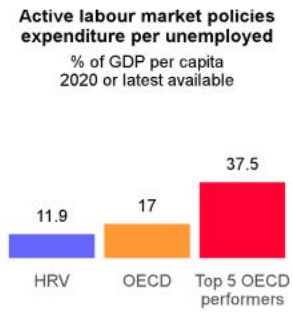
- Efforts are underway to lessen the considerable barriers from regulatory enforcement and the justice system to starting and operating a business. Reforms to the insolvency framework are improving its quality and recovery rates.
- The large role of state-owned enterprises in competitive sectors impedes innovation and market dynamism. Many of the expanding firms are not the most productive.

- Undertake reviews of existing regulations and enforcement approaches and align approaches across regions and levels of government.
- Review state asset holdings, to progressively divest assets that do not meet public service criteria and improve management oversight of those that are retained by the public sector.
- Promote dispute avoidance mechanisms tailored to business needs, such as out-of-court mediation or a Business Ombudsman, to help expedite the legal process and reduce the cost of disputes.





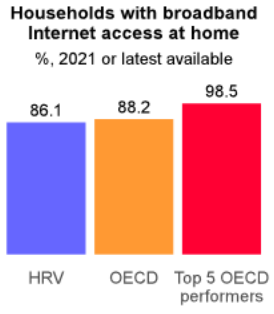


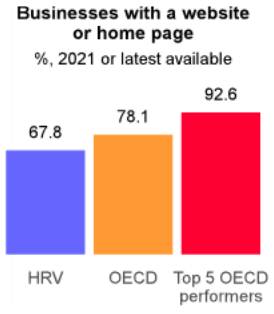


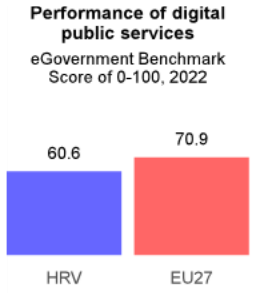
Digital transition

- Access to high-speed broadband lags other European countries, especially in remote areas or among more disadvantaged populations.
- Digitalisation of the public sector, from the core administration to services ranging from health care to the judiciary, is progressing but from a low base and is central to efforts to improve the public sector's effectiveness.
- Shortages of key digital and related skills are a barrier to digitalisation and firms' growth, and participation in training is low.

- Expand access to digital and foundation skills training, e.g., by developing individual accounts that finance education programmes. Provide additional resources to lower-skilled adults and other groups with weak labour market attachment.
- Pursue digitalisation of the public sector, prioritising developing platforms that support digitalisation across public bodies, while simplifying and reforming underlying work processes to align with the digitalised systems.
- Expand access to cost-effective and reliable high-speed internet infrastructure for all groups and regions.

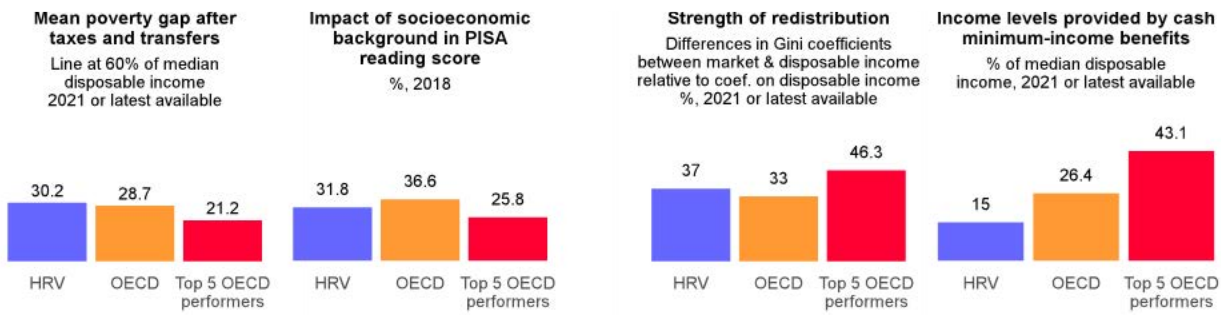






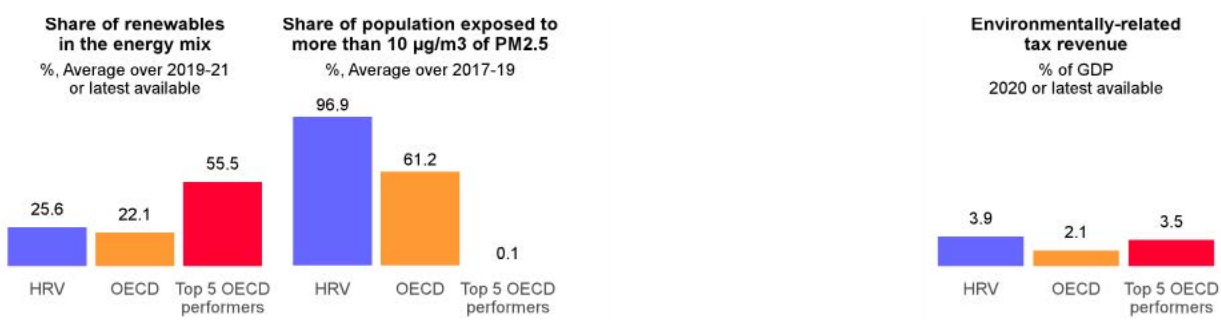
Inclusiveness, social protection, and ageing

- The population is projected to shrink by one-quarter over the next half-century, reflecting low fertility and net emigration. Yet the budgetary costs of ageing are relatively modest and projected to be stable. Income adequacy among the elderly may fall further, bringing risks of higher old-age poverty and endangering the financial sustainability of current retirement income policies.
- The COVID crisis highlighted some weaknesses in the health system, including access to quality care and inefficient management practices.
- Family policies, while substantial, do not encourage carers to work.
- Reform the pension system by linking retirement ages with life expectancy, and by introducing incentives for older workers to continue working and to build their future retirement incomes.
- Improve health system effectiveness by aligning financing with management responsibilities, and pooling procurement and other common management functions.
- Reform family policies to provide greater support to carers who work, reducing the loss in net income or career disruption from having children.

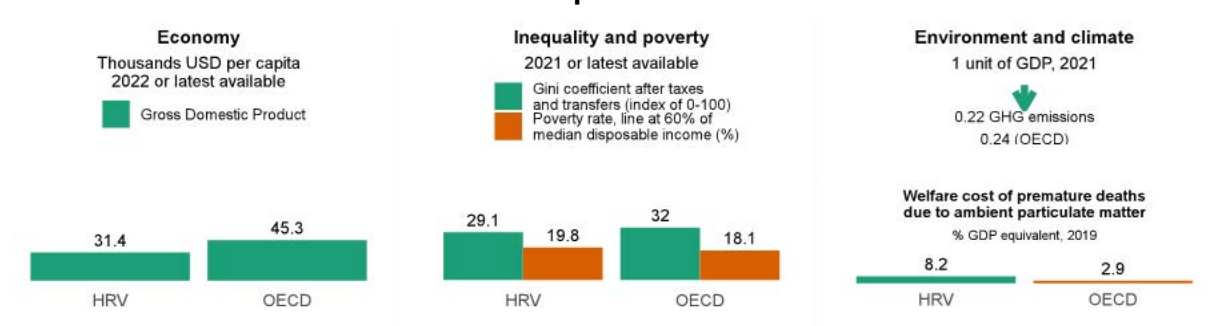


Climate transition

- Croatia is reducing its greenhouse gas emissions in line with its international commitments, but substantially more progress will be required. Emissions are high relative to output, despite services' large share of activity and the high share of electricity generated from renewable and nuclear sources. Climate change is bringing more frequent floods and hotter summers.
- Ensure that investments in building renovations and reconstruction, achieve high levels of energy efficiency.
- Pursue measures to raise the rail system's attractiveness and energy efficiency for passenger and freight transport.
- Improve the efficiency of water use by upgrading the fresh- and waste-water infrastructure, reducing leakages, and improving utilities' management and financial sustainability.



Overall performance



CZECH REPUBLIC

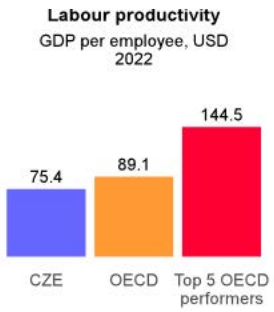
Performance gaps

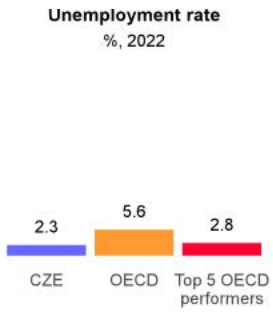
Recommendations

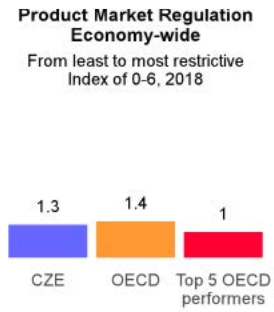
Product and labour markets functioning

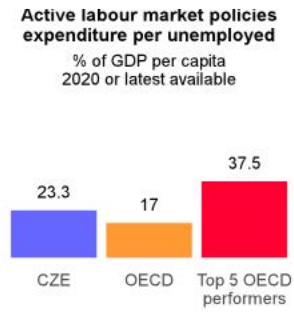
- Procedures to obtain construction permits and to start a business are cumbersome and lengthy, inhibiting the entrepreneurial drive and the green transition.

- Streamline permitting processes and regulations in construction and reduce the time and number of procedures for starting a business.





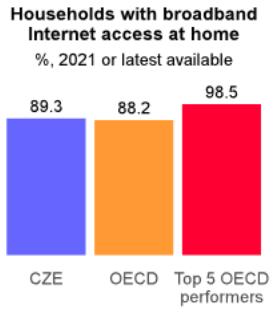


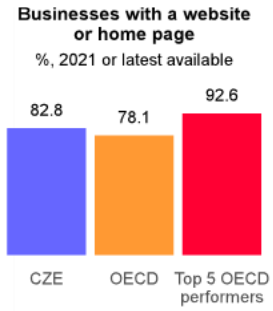


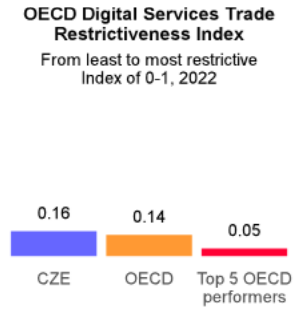
Digital transition

- Evidence points to high basic digital skills. Yet, the economy lacks information and communication technology specialists, with the share of female ICT specialists particularly low. Czech firms are slow to adopt more sophisticated technologies, lagging behind in using AI and big data, holding back their digital transformation.
- Coverage of very high-capacity networks is low, and access to internet broadband connection is unequal across regions and cities. Quality of public administration – at the local level in particular – could be strengthened by greater use of digital technologies and e-government.

- Strengthen specialised digital and IT skills by modernising education, including VET, and better adapting it to adult learning.
- Increase funding and capacity to boost investment in digital infrastructure and technologies.
- Continue rolling out of eGovernment and offer training to local public officials.

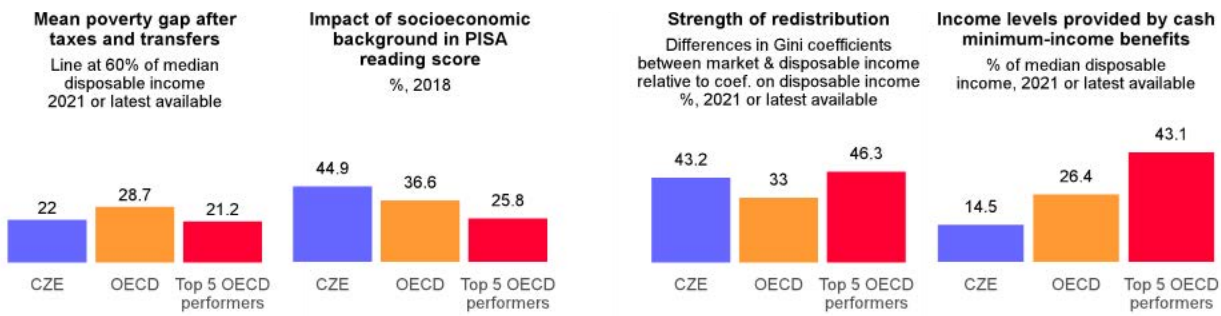






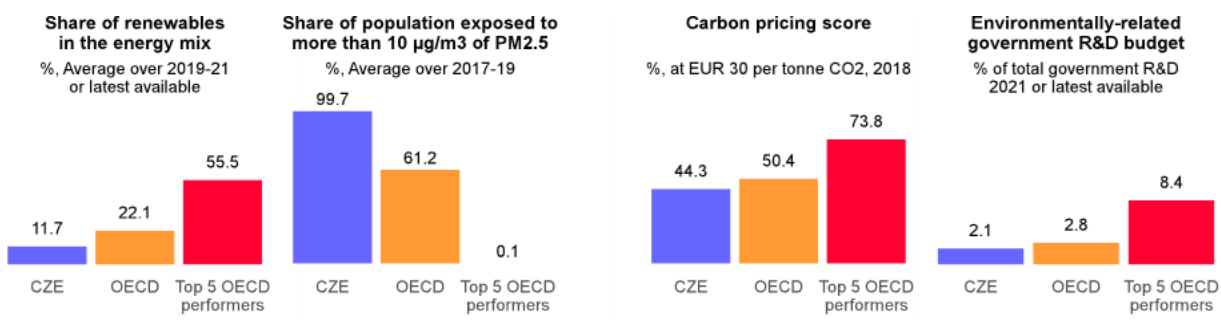
Inclusiveness, social protection, and ageing

- Population ageing will result in steep future rises in public spending. Yet, Czech workers retire too early. Early retirement is still possible from the age of 60 and employment rates fall sharply after this age.
- Childbirth has a large impact on labour market activity of mothers and the gender wage gap is sizable. Family cash benefits and tax breaks are generous while access to high-quality public childcare support is low, particularly for children under the age of three.
- Continue raising the retirement age and link it more tightly to increases in longevity. The minimum age of early retirement should also be increased.
- Keep expanding the supply of affordable and high-quality childcare facilities. Lower untargeted family cash benefits and gradually reduce the maximum duration of parental leave.

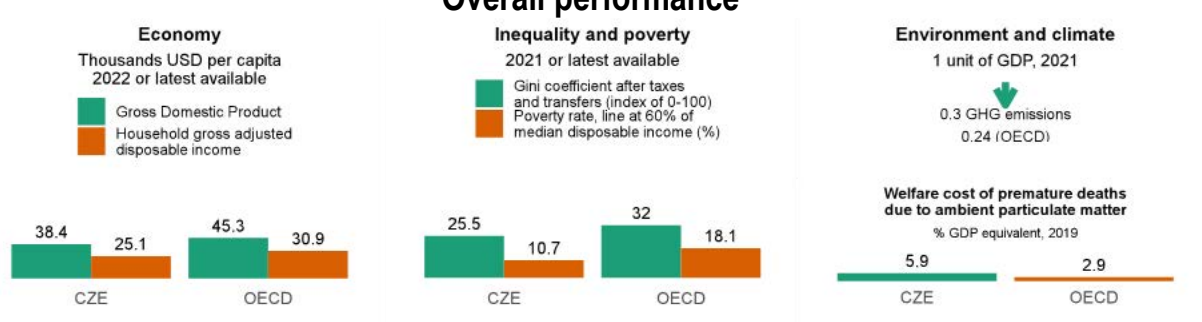


Climate transition

- Extensive use of coal for electricity production and heat generation contributes to high greenhouse gas emissions. Reliance on heavy industry coupled with older and poorly insulated dwellings make the Czech economy highly energy intensive.
- Current environmental policies are not stringent enough to effectively curb emissions. Effective carbon rates are among the lowest in the OECD. Tax exemptions are applied on various fuels, which decreases end-use prices and limits incentives to save energy or to switch to cleaner fuels.
- Scale up investment in renewable and low-emissions energy sources and boost energy efficiency, notably in the residential sector, including by drawing on the NextGenerationEU financing.
- Introduce an explicit carbon price (with a pre-announced price trajectory) to cover all emissions for sectors outside the EU's ETS.



Overall performance



DENMARK

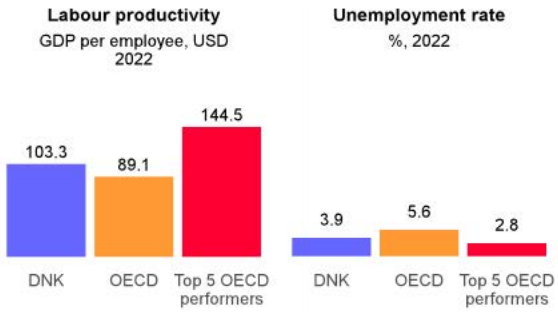
Performance gaps

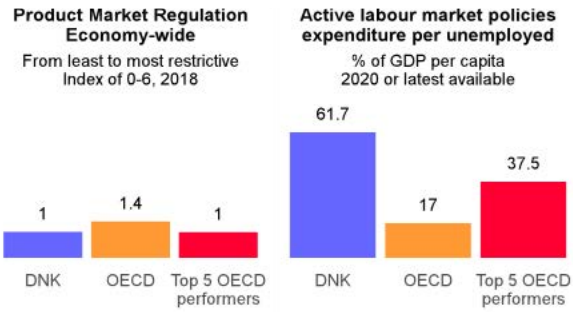
Recommendations

Product and labour markets functioning

- Rent regulation distorts and hampers growth in the private rental market, limiting mobility.
- Favourable tax treatment stimulates homeownership unduly. Low housing taxation reduces the overall efficiency of the tax system.

- Deregulate the rental market notably by easing special rent regulation for flats in buildings constructed before 1991.
- Shift the tax burden further away from labour and corporate incomes by raising the property and land tax rates and by reducing tax deductibility of interest expenses.

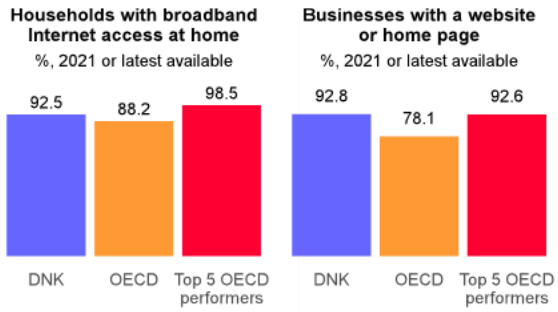


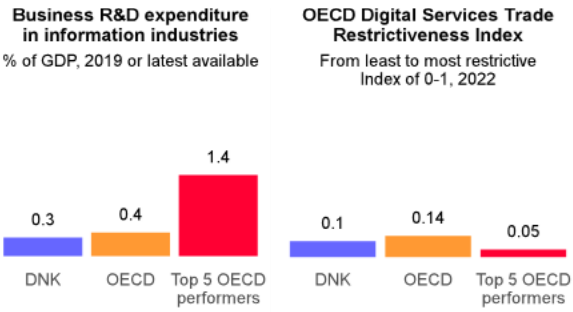


Digital transition

- Despite strong digital infrastructure provision, e-government and digital skills, modest investment in intangibles and labour shortages in ICT threaten the diffusion of productivity-boosting digital technologies. Investment is hampered by high top marginal tax rates on labour and capital income.

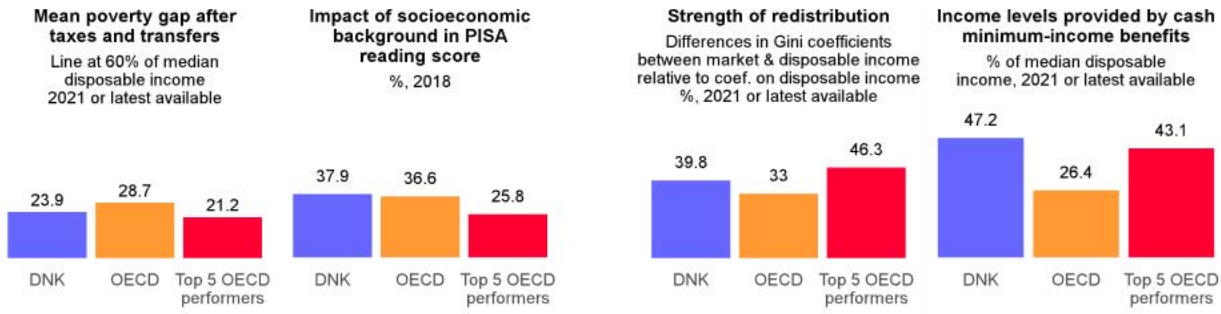
- Develop VET programmes that reflect future structural changes in the economy, such as digitalisation, and offer pathways to higher education.
- Reduce top marginal tax rates on labour and capital income.





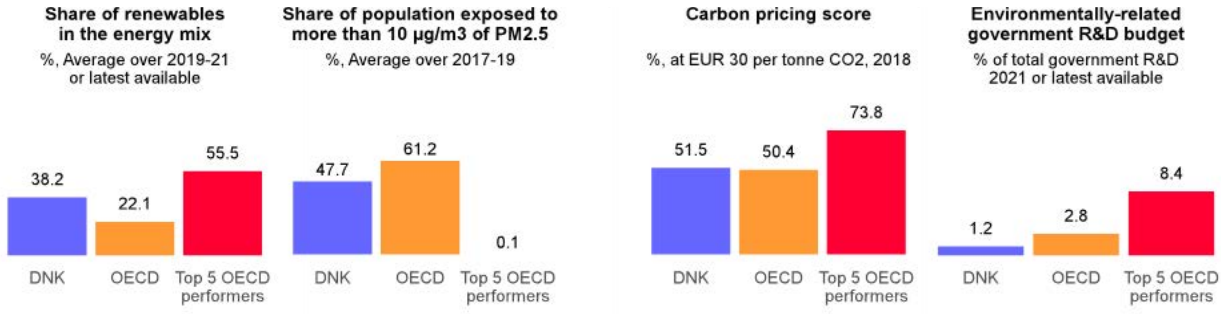
Inclusiveness, social protection, and ageing

- Social protection is strong and high-quality public services support social mobility. However, large gaps in employment rates and educational outcomes between foreign-born and natives persist. School segregation of immigrant students is high by OECD standards.
- Improve immigrant integration programmes by broadening the adoption of best practices across municipalities and extending the Integration Education Programme.
- Implement a broad integration strategy in the education system to address performance gaps.

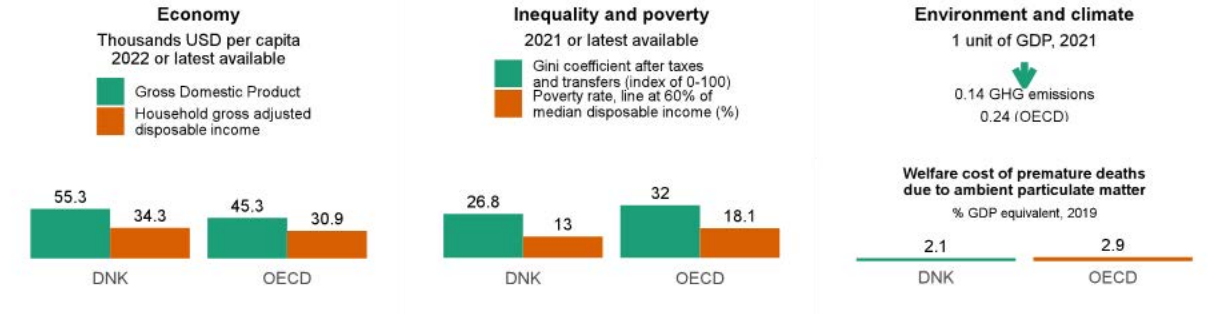


Climate transition

- Denmark has been a frontrunner in climate change mitigation policies and successfully reduced greenhouse gas emissions. However, achieving carbon neutrality as planned in a cost effective and inclusive way will require effective carbon pricing, while compensating for adverse distributional effects.
- Make emission pricing outside the EU Emissions Trading System more uniform by implementing a minimum price.
- Provide targeted support to those negatively affected by climate policy in a transparent manner, including via reduced taxation of renewable energy and means-tested transfers.



Overall performance



ESTONIA

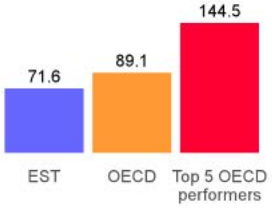
Performance gaps

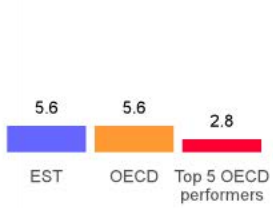
Recommendations

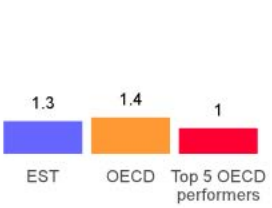
Product and labour markets functioning

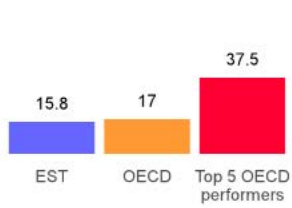
- Given the small size of the country, competition in some domestic sectors remains limited.
- Regulations for lawyers and notaries could allow for more competition in these services.
- Regulatory transparency could be increased through systematic rules on interactions between public and private officials including in the Parliament.

- Remove quantitative and territorial restrictions on notaries, allow inter-professional cooperation and advertising.
- Review regulations on voting right in law firms, allow setting up of business with other professionals.
- Strengthen accountability of the energy and rail regulators by requiring that they present annual report to the relevant parliamentary committees.
- Award public services contracts for rail transport through competitive tenders.
- Mandate disclosure of interest groups that are consulted in regulatory and legislative processes and cooling-off periods for members of legislative bodies, members of cabinet and appointed public officials leaving office.





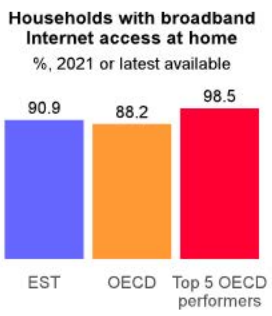


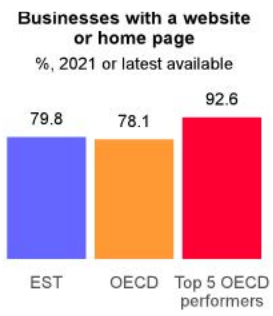


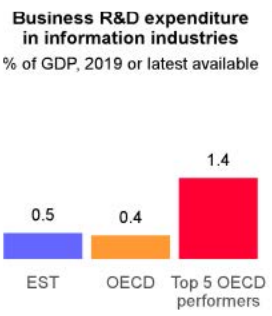
Digital transition

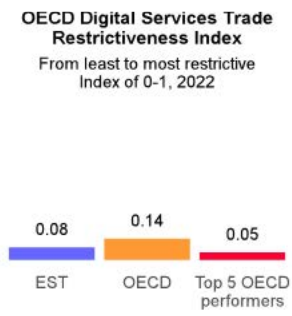
- Despite solid and secure digital infrastructure, world-leading e-government and high levels of trust among users of digital services, Estonian companies, in particular small ones, lag behind, hampering digital diffusion.

- Boost public investment to better support coverage for ultra-fast broadband, including subsidising last-mile rollout for smaller enterprises.
- Reduce red tape in the application process for digital diagnostics, to better identify digital needs of companies, and increase take-up rate.



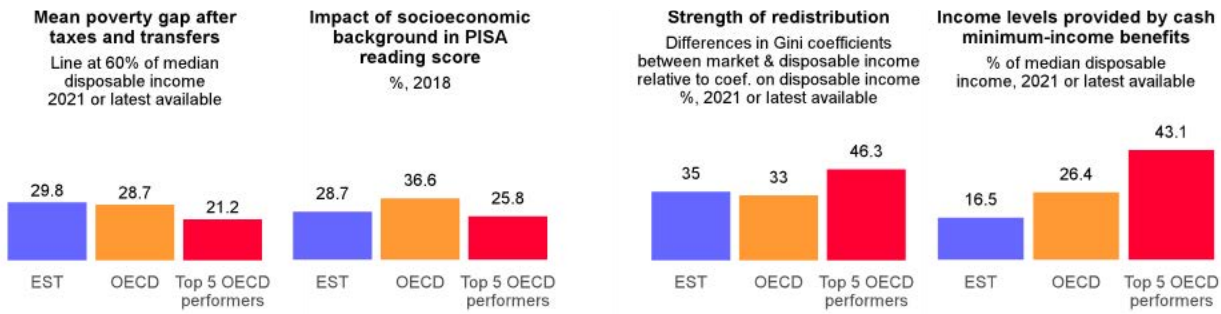






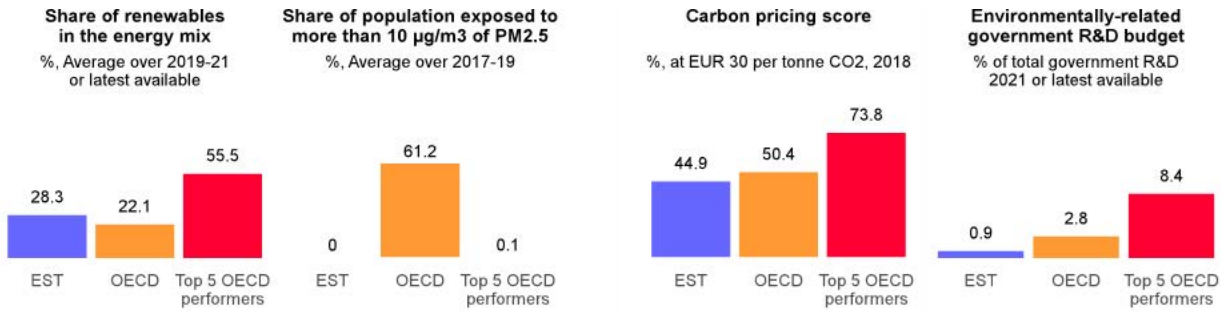
Inclusiveness, social protection, and ageing

- Poverty is a persistent challenge worsened now by elevated inflation. One out of ten workers live in a poor household. Reducing relative poverty to 15% by 2023, from one of the highest levels in Europe, necessitates further reforms.
- To cope with accelerating digital diffusion and the transition towards a climate-neutral economy, further ramping up of active labour market policies and training activities for the unemployed, those at risk of unemployment and displaced workers, is warranted.
- Reduce low-wage employees' social security contributions to support take-home pay.
- Tighten transfers targeting and use digital and data to raise take-up.
- Create in-work benefits to make work pay.
- Increase spending on active labour market policies.
- Further align job-search assistance and training with local labour market needs, notably where carbon-intensive activities are concentrated.
- Conduct ex-post evaluations of training using the government's strong digital capacities.

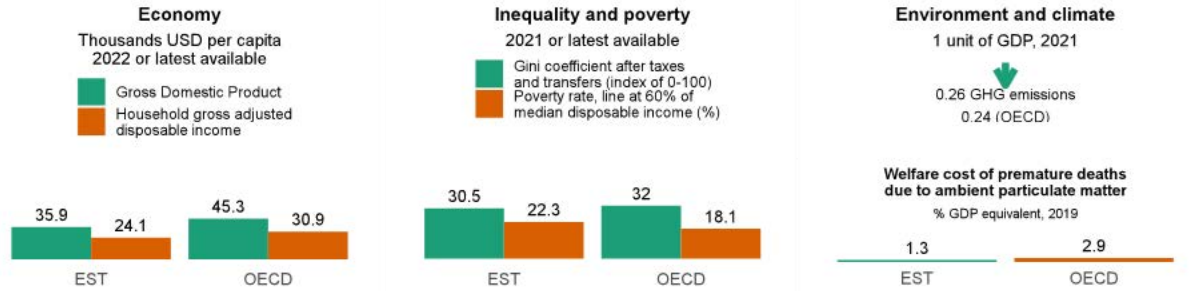


Climate transition

- High GHG emissions have declined substantially. However, the economy is still relatively carbon intensive and oil shale remain prevalent in energy supply. Highly concentrated in the north-eastern region of Estonia, the phasing-out of this industry will have significant economic and social impacts.
- To enhance energy security, expedite synchronisation of the electricity grid with European standards.
- Reduce oil shale output over time as planned but mitigate the social impact through a funded comprehensive and long-term development plan.
- Further encourage low-carbon technology innovation by expanding public R&D investment and increasing the share of funding on environment-related issues.



Overall performance



EUROPEAN UNION

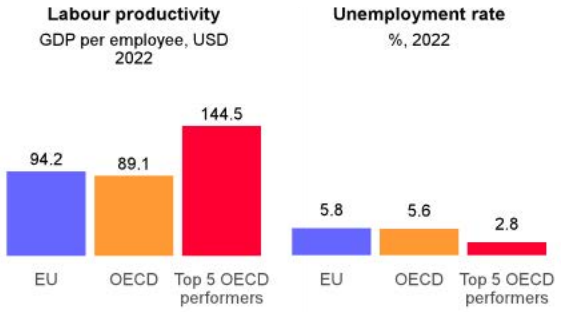
Performance gaps

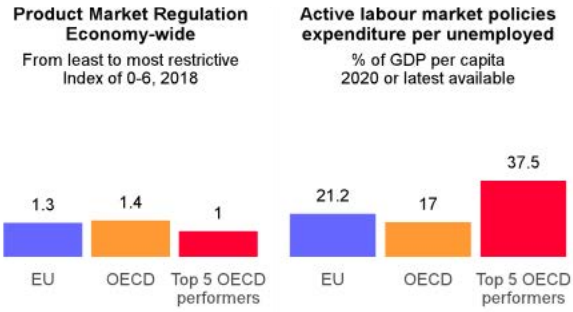
Recommendations

Product and labour markets functioning

- Resilient labour markets can help reduce large differences in business cycles across countries, which is threatening economic convergence and European cohesion. Countries that favour within-firm work flexibility in case of shocks and have a good training system for the unemployed enjoy more resilient employment in the face of shocks.
- Strengthening the single market for capital will reduce the reliance of European financial markets on banks. The European banking system is not yet fully integrated and deposits in euro area banks are vulnerable to shocks in individual countries, amplifying the risk of financial fragmentation.

- Encourage member states to reinforce job retention schemes to be used in case of a temporary shock, together with training.
- Rigorously assess the economic impact of the European instrument for temporary Support to mitigate Unemployment Risks in an Emergency (SURE) and Next Generation EU as they could provide valuable inputs to the debate on the completion of the Economic and Monetary Union.
- Complete the Banking Union by addressing all outstanding issues in a holistic manner and with the same level of ambition.

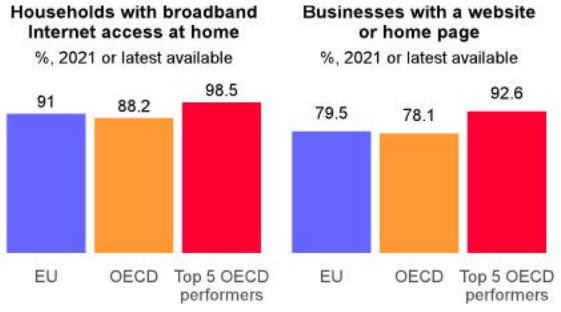


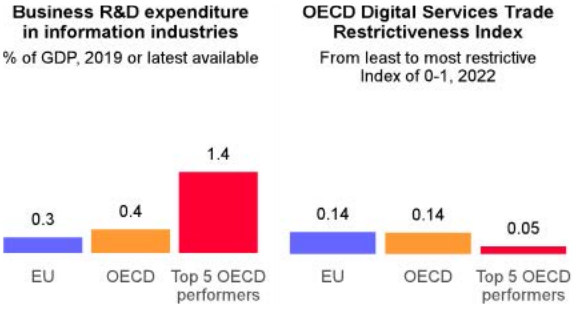


Digital transition

- Substantial investment, largely private, will be needed to reach the EU 2025 connectivity targets, which envisage much higher connection speeds than today, at least 100 Mbps for all households and 1000 Mbps for digitally intensive firms and main public institutions. Widespread use of digital technologies would also improve consumer choice and facilitate cross-border labour mobility.

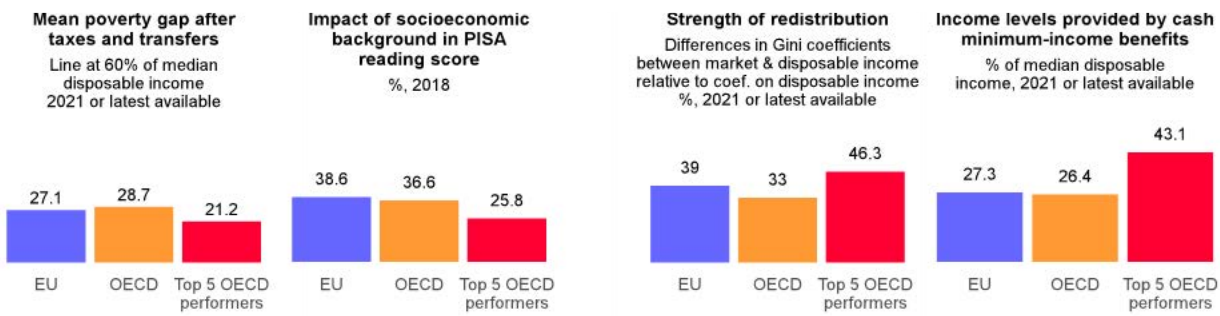
- Use digital tools to provide information on products, including on recycling and repair possibilities.
- Remove barriers to private investment for the climate and digital transitions by simplifying licensing procedures.
- Complete the implementation of the Electronic Exchange of Social Security Information.





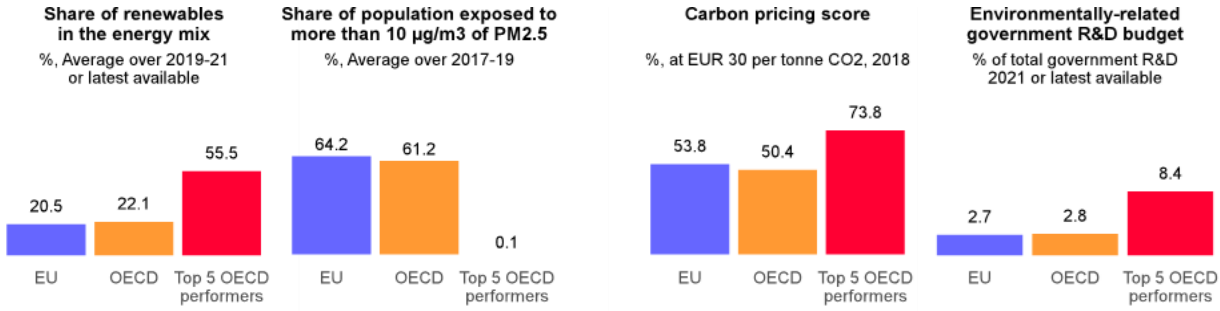
Inclusiveness, social protection, and ageing

- Higher cross-border labour mobility is needed to improve resilience and the matching of workers with job offers across countries. Moreover, EU budget support should be made more efficient to support regional convergence.
- Half of cohesion funding is spent through public procurement, but tendering procedures are often not competitive enough and projects are often selected on a first-come first-served basis.
- To favour job reallocation in case of a durable shock, encourage member states to enhance activation policies, including for workers under job retention schemes.
- Extend cross-border recognition of professional qualifications.
- Make public procurement more competitive and ensure compliance with transparency requirements.
- Further adopt competitive project selection procedures, emphasising regional growth objectives.

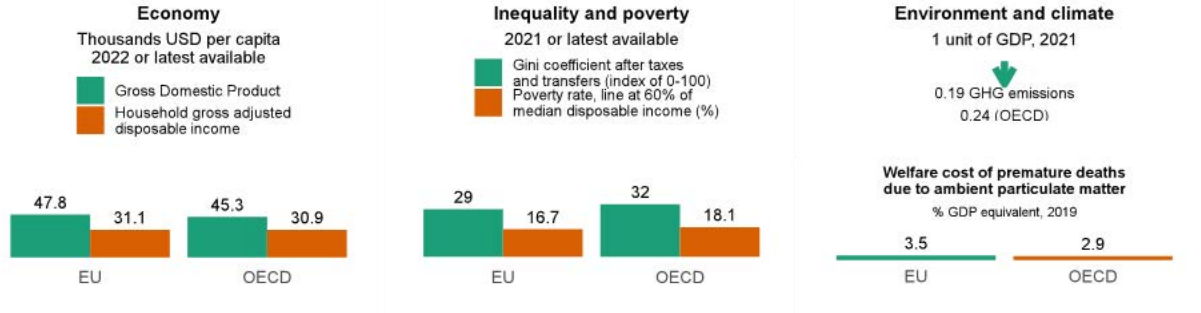


Climate transition

- Reducing EU net emissions of greenhouse gases to zero by 2050 implies electrifying most energy end use, generating most electricity from renewables, developing low-carbon fuels for sectors hard to electrify alongside carbon capture and storage, and increasing energy efficiency. Higher carbon pricing, stronger regulatory standards and more innovation are key to achieving climate neutrality. Moreover, bringing transport and buildings into an Emissions Trading System could spur emission abatement, accompanied by more demanding standards for energy efficiency and further assessment and disclosure of climate related risks.
- Increase the EU Emissions Trading System coverage, by for example including transport and buildings.
- Strengthen regulatory standards for energy efficiency.
- Require comprehensive disclosure of climate and environment-related risks by financial intermediaries and large non-financial firms.



Overall performance



FINLAND

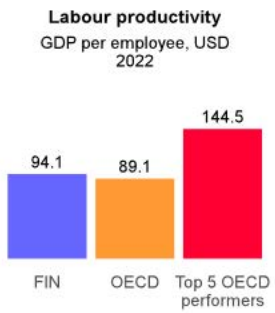
Performance gaps

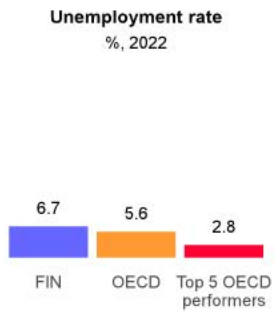
Recommendations

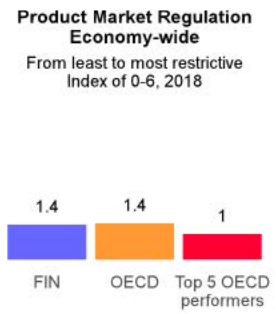
Product and labour markets functioning

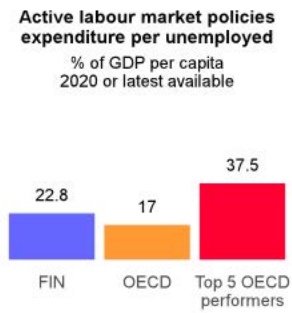
- Skills mismatches have increased over time and are greatest in non-cyclical (e.g. health) professions. Shortages of study places in higher education institutions reduce tertiary education attainment, contributing to skills shortages.
- Firms that are not members of the employer association that negotiated the sectoral wage agreement are by law forbidden from using the enterprise-bargaining flexibility clauses, weighing on employment and productivity.

- Increase tertiary study places and their funding while enhancing flexibility in their allocation across study fields to address structural skills shortages.
- Set broad framework conditions in sectoral wage agreements but allow for more flexibility in all firm-level contracts.





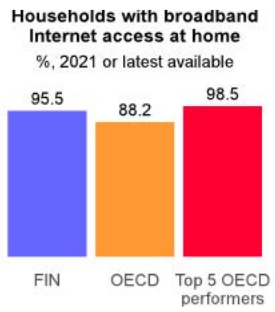


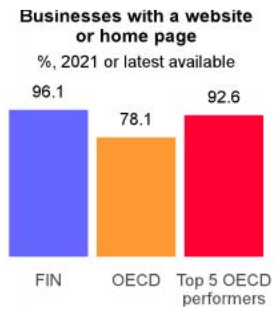


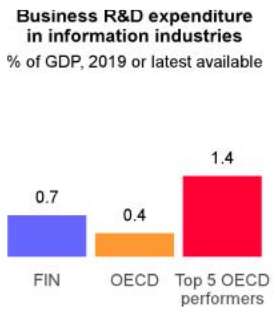
Digital transition

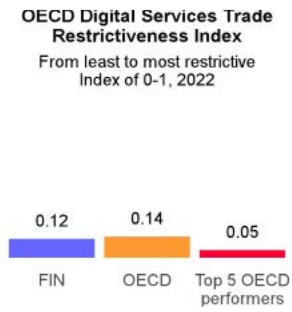
- Government use of digital technologies is held back by low use of data to drive decision making.
- ICT investment as a share of GDP is low, held back by shortages of skilled workers.

- Establish better data governance, access, sharing and re-use mechanisms to improve decision making and service delivery.
- Increase tertiary attainment, skilled work-based immigration and spending on training to equip displaced workers with needed skills.



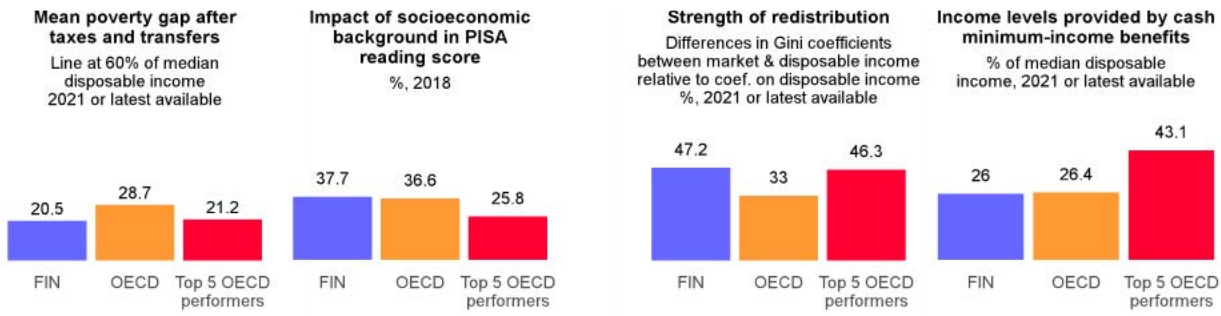






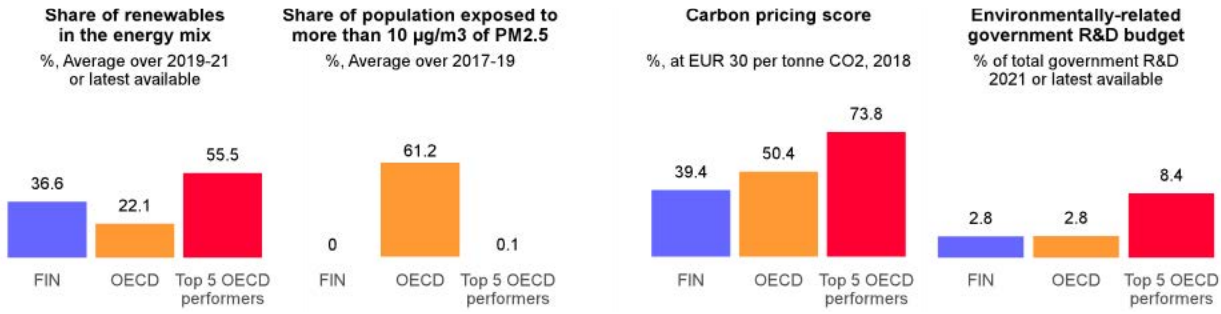
Inclusiveness, social protection, and ageing

- Incentives to improve efficiency in the healthcare and social-care reform appear to be too weak to encourage the new organisations responsible for delivering healthcare, and social-care services to implement measures that would lead to efficiency gains.
- The generous homecare allowance discourages work by mothers with young children, long absences from the labour force negatively affecting their career prospects and earnings mobility.
- Monitor the healthcare and social-care reform and strengthen incentives to improve efficiency if they prove to be too weak.
- Reduce the homecare allowance and increase formal care subsidies to increase incentives for mothers of young children to work.

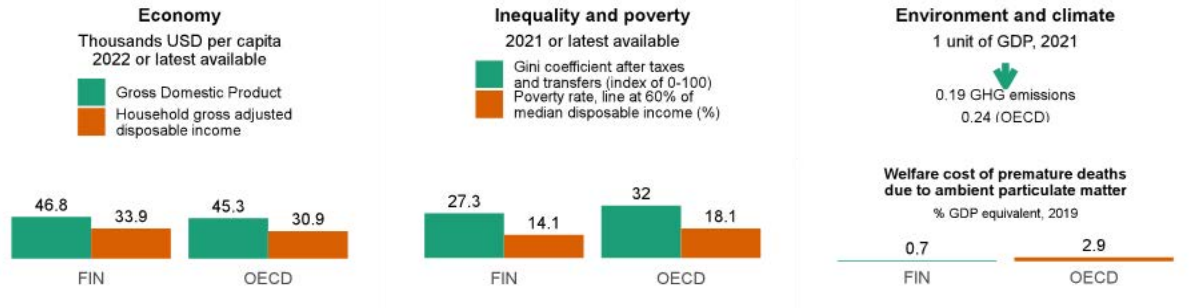


Climate transition

- The forestry and other land use net sink is not on track to meet Finland's share of the 2030 EU target for this sector and to achieve the net zero emissions target by 2035. The cultivation of peatlands emits 16% of total greenhouse gas (GHG) emissions.
- Heat production is subject to a much lower energy tax rate when using peat (12% of GHG emissions) than when using other fossil fuels.
- Additional measures are needed to reduce car dependency in cities.
- Create instruments to guide the cultivation of peatlands towards cultivation of wetted peatlands.
- Subject forestry to carbon pricing.
- Subject heat production using peat to the same tax regime as for other fossil fuels.
- Strengthen policies to reduce car dependency in cities, while focusing funding for low-carbon private cars in areas without public transport.



Overall performance



FRANCE

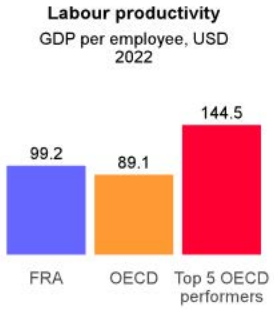
Performance gaps

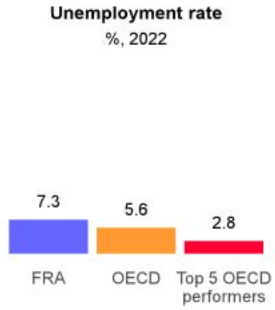
Recommendations

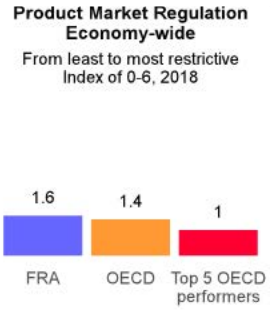
Product and labour markets functioning

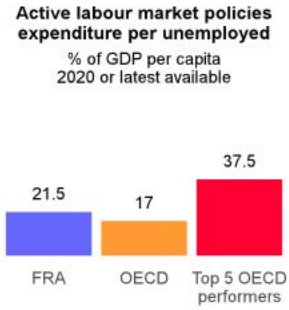
- The short supply of housing in fast-growing areas prevents greater housing mobility and employment, especially for young people.
- Tax expenditures are considerable and the effectiveness of some measures, such as tax exemptions for working overtime and household saving incentives, is weak.
- The quality of lifelong learning programmes is uneven, and the COVID-19 crisis halted the roll-out of quality labels for training bodies.

- Refocus the eligibility of housing-supply subsidies to the most densely populated areas.
- Allocate responsibilities of local infrastructure and urban planning to groups of municipalities to better address environmental and other spill overs.
- Streamline local government organisation by merging small municipalities.
- Reduce tax expenditure, in particular expenditure that does not benefit low-income households or measures that encourage excessive household savings.
- Ensure access to transparent information and effective monitoring of the quality of lifelong learning programmes, through strengthened counselling and regular evaluations of programme providers.





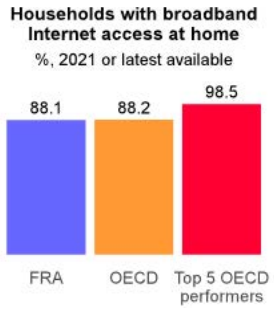


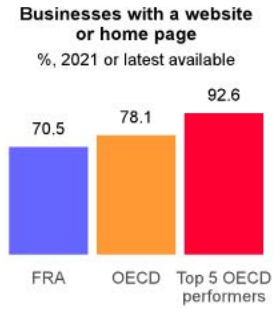


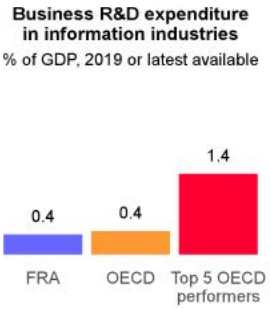
Digital transition

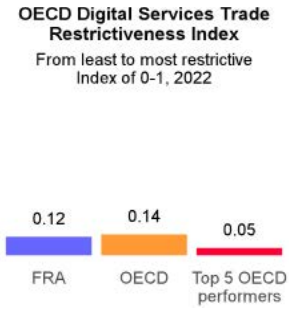
- Digital infrastructure, notably the roll-out of superfast broadband and the use of e-government procedures have improved, but the take-up of digital technologies by small businesses remains low.
- A lack of training among managers and employees, and poor knowledge of support mechanisms act as a barrier to the take-up of digital technologies.

- Provide financial support for training in digital technologies for small businesses.
- Establish local one-stop shops providing a range of activities to support human resources practices in small businesses.



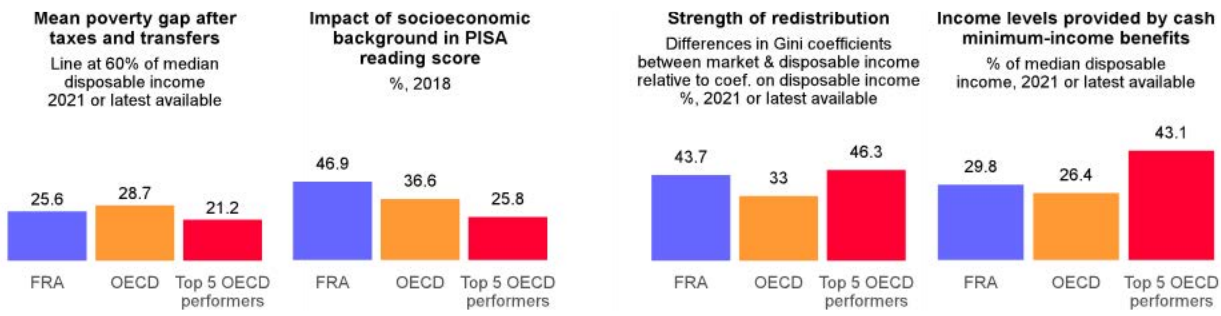






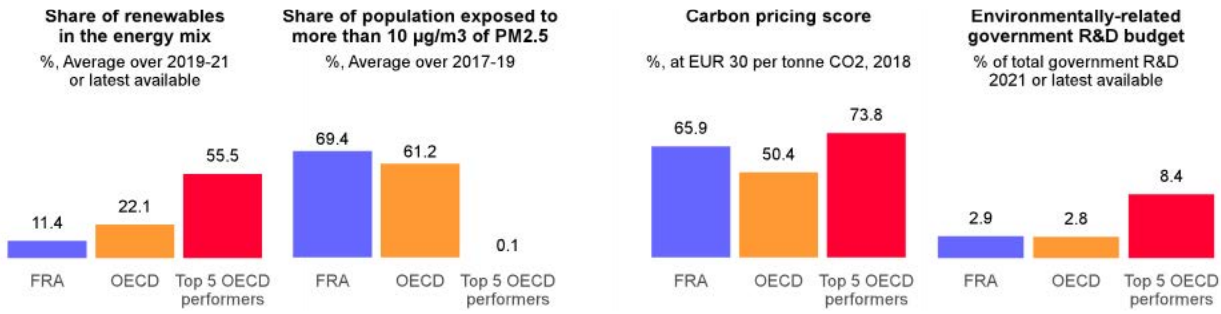
Inclusiveness, social protection, and ageing

- Despite progress over recent years, the employment rate remains relatively low. In particular, the effective age of exit from the labour market is low.
- Improving access to good-quality early childhood education and lifelong learning are also essential to reduce inequality in opportunities, disadvantaged households having less access to formal childcare arrangements.
- Encourage a rise in the effective labour-market exit age, notably by increasing the minimum retirement age in line with life expectancy.
- Speed up the development of additional childcare services for low-income households and in disadvantaged neighbourhoods.
- Continue to reduce class size in disadvantaged neighbourhoods and promote innovative practices in teacher training to meet the different needs of pupils.

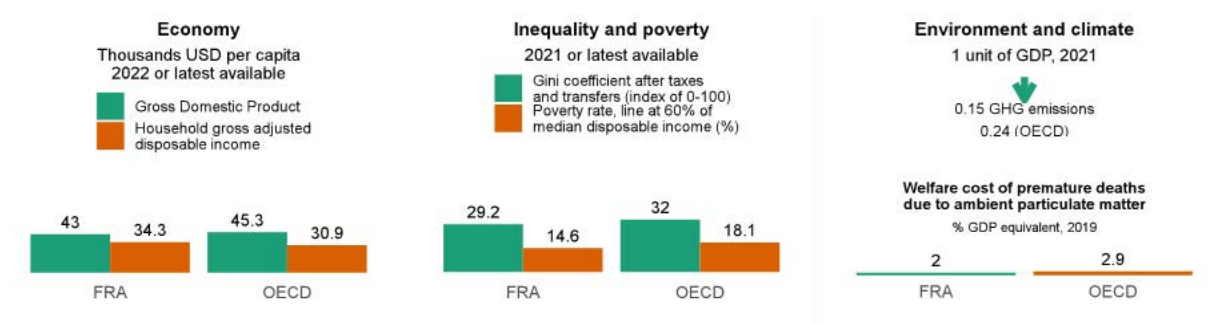


Climate transition

- France's level of emissions is low. Yet, the pace of emission cuts must accelerate to reach its target of carbon neutrality by 2050. Carbon prices remain uneven across sectors.
- Some support schemes for building renovations do not encourage efficient energy renovations.
- Land take continues to increase.
- Progressively align carbon prices across sectors while resuming the gradual upward trend of the carbon component of energy taxes.
- Condition support schemes for building renovations on achieving minimum energy-efficiency standards and tighten controls on major projects to ensure energy-efficiency gains.
- Reform the planning tax to integrate a "bonus-malus" scheme to discourage land take and encourage densification.



Overall performance



GERMANY

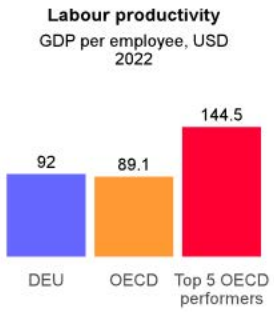
Performance gaps

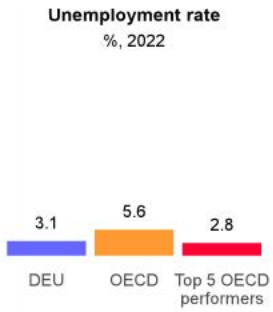
Recommendations

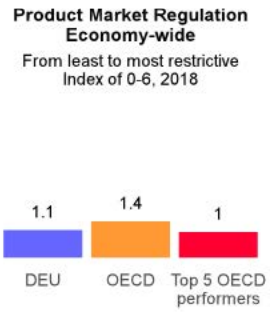
Product and labour markets functioning

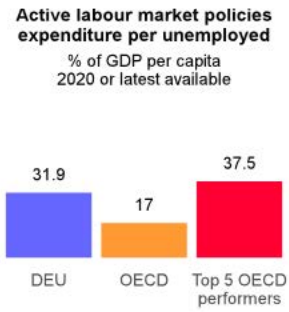
- Infrastructure investment has moderately increased in recent years. However, weak municipal infrastructure investments, lengthy planning and approval procedures, remain key challenges.
- Market entry and competition is hampered by a high administrative burden and strict occupational entry regulations.
- Skilled labour shortages weigh on the productivity of firms and risk to hinder investments in green and digital infrastructure.
- Venture capital investment as a share of GDP is low, and the banking sector has difficulties in providing credit to young and innovative firms.

- Bolster local infrastructure planning capacity through inter-municipal cooperation, training and expanding staffing in key roles.
- Reduce administrative burdens and improve stakeholder engagement in regulatory policymaking.
- Liberalise labour market entry conditions, prioritising sectors subject to supply constraints.
- Expand Active Labour Market Programmes, focusing on vocational education and training and basic education for adults.
- Improve the effectiveness of start-up and growth financing instruments as well as conditions for institutional investors to invest in venture capital.





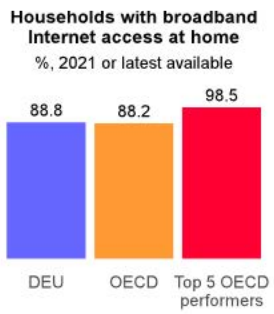


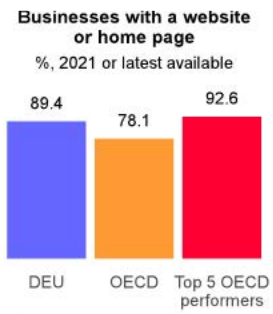


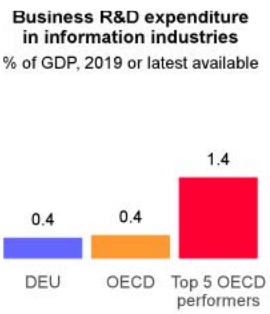
Digital transition

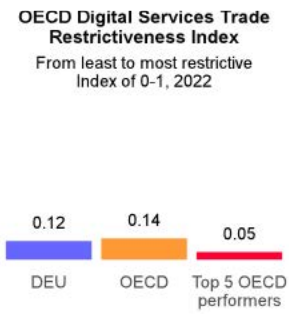
- Germany is a world leader in technology and engineering, but lags on digital transformation. Access to high-speed broadband and mobile data connections lags behind, particularly in rural areas.
- Firms' investments in knowledge-based capital are low, contributing to weak adoption of key ICT tools, especially in SMEs.
- The lack of mandatory common standards on design and interlinkage of data and IT tools across levels of government hinders the digitalization of public services. ICT infrastructure in schools is weak.

- Ensure that incentives for investment in physical capital do not discourage spending on digital services, and better support the digital transformation of SMEs.
- Set mandatory common IT standards and encourage the harmonization of administrative procedures and joint software development across levels of government.
- Raise public investments in school infrastructure and improve ICT training for teachers.



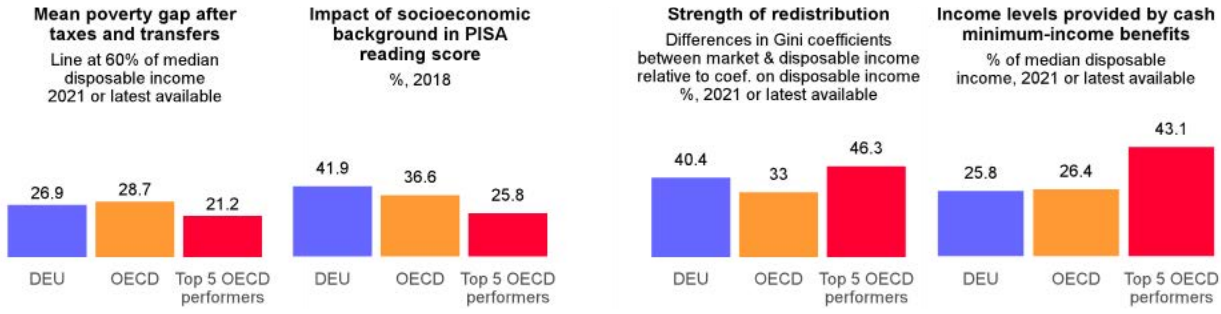






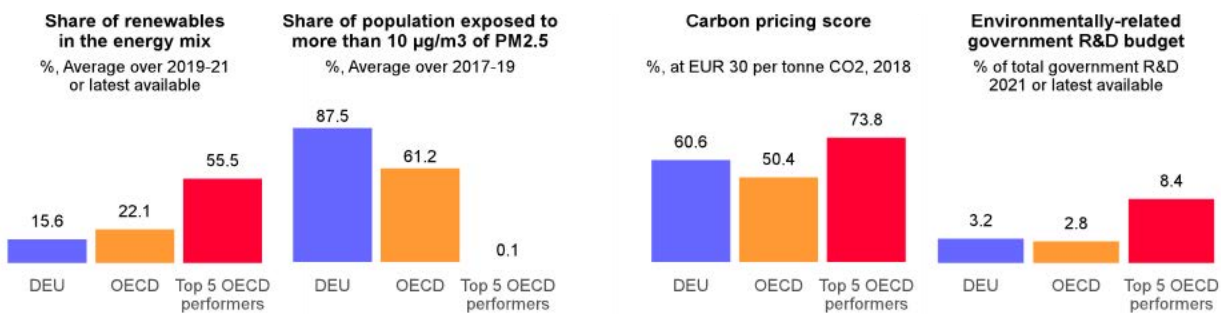
Inclusiveness, social protection, and ageing

- Rapid population ageing will reduce fiscal space and exacerbate labour shortages. Many elderly and low-skilled workers encounter difficulties to updating their skills.
- Many women work part-time and are overqualified for their jobs.
- Inequality in education outcomes is among the highest across OECD countries. Teacher shortages are high. Access to childcare and early-childhood education is limited due to informal and decentralised application procedures.
- Improve adult learning opportunities and facilitate participation of low-skilled individuals by better recognition of prior-learning and workplace outreach.
- Reform the current joint income taxation rules for couples to raise labour supply incentives of second earners.
- Further expand access to early-childhood education by centralising application procedures within municipalities.
- Raise the quality of basic education by using frequent performance evaluations to better target support and improve teaching quality.

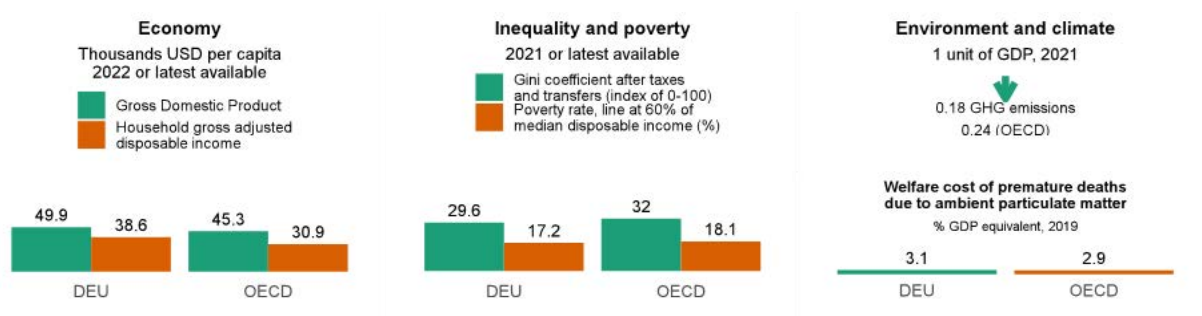


Climate transition

- Germany set an ambitious target of reaching climate neutrality in 2045, which requires tripling the speed of emission reductions. Emission pricing can effectively help to reduce emissions, but price levels are too low, unpredictable and unharmonised.
- Income support measures to households affected by higher carbon prices are not well targeted due to weak data and IT infrastructure.
- The energy crisis has emphasised the need for accelerating the expansion of renewable energy supply. Electricity generation from renewables is less stable over time, but price signals do not contribute to better match demand and supply.
- Set an emissions cap for all sectors not covered by the EU ETS, in line with national emission reduction targets, and phase out fossil fuel subsidies and tax expenditures.
- Allow for accessing, linking and analysing administrative datasets across levels of government to better target support, while ensuring adequate data protection and confidentiality standards.
- Streamline and facilitate permitting procedures for solar and wind capacity installations.
- Introduce time-variable grid charges.



Overall performance



GREECE

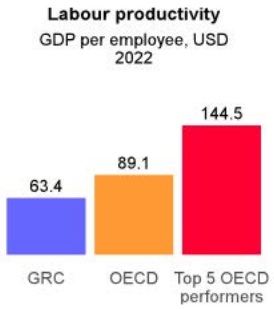
Performance gaps

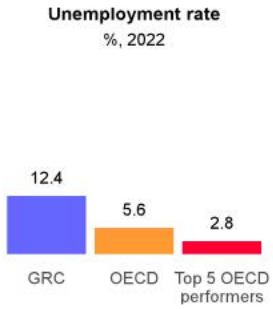
Recommendations

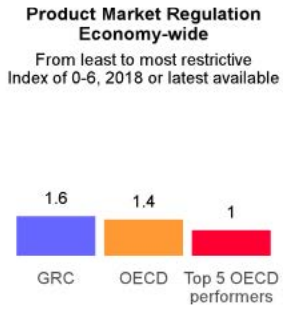
Product and labour markets functioning

- Ongoing reforms are working to improve the business environment, but challenges remain, especially in the responsiveness of the justice system.
- Greece's economy is dominated by small firms with low productivity and limited growth potential, dragging overall productivity. Price competition remains low in many markets, while regulatory burdens to operate in some key sectors and to re-develop land impede new entrants. Non-performing loans, weigh on the banking sector's capacity to fund investment.
- Workers change jobs less often than in most OECD countries, yet the green and digital transitions will require many workers and firms to adapt their activities.

- Improve the legal system's effectiveness by simplifying administrative processes and communicating benefits of alternative dispute resolution mechanisms.
- Lower entry barriers, prioritising professional services, and simplify land zoning rules.
- Increase participation in quality active labour market policies and training, including across all sectors and regions affected by the green economy transition.



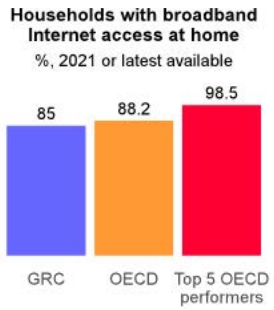


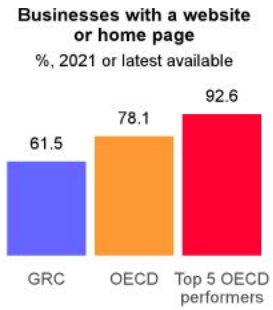


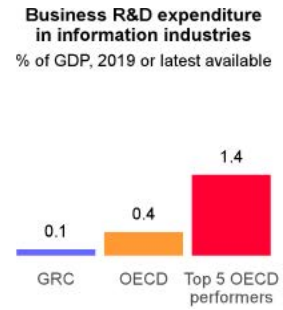
Digital transition

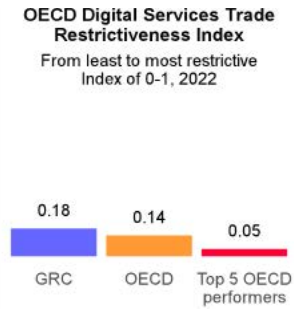
- Public services are digitalising rapidly but progress in the private sector is slower due to weak investment in equipment, software, training and organisation, especially among the many small firms.

- Pursue digitalisation and administrative simplification across the public sector, focusing on reforming public procurement and work processes to develop skills and operate in digitalised environments.
- Implement Greece's Recovery and Resilience Plan 2.0, which includes several investments and other policy measures to improve digital infrastructure and support digitalization of firms.



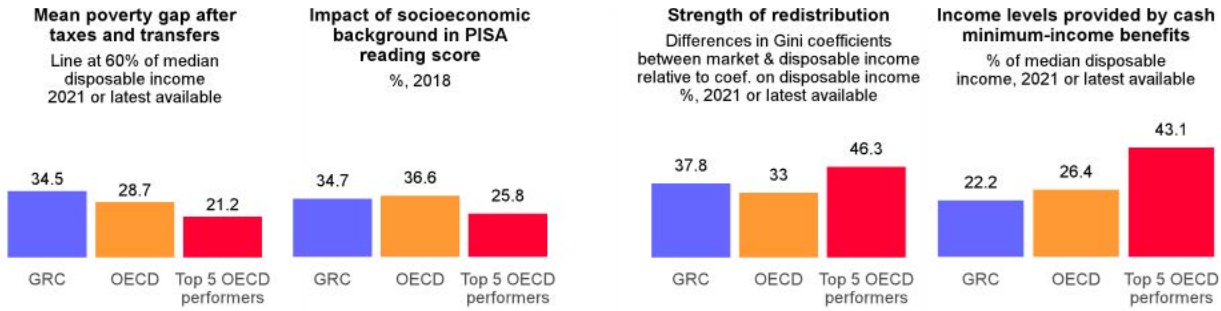






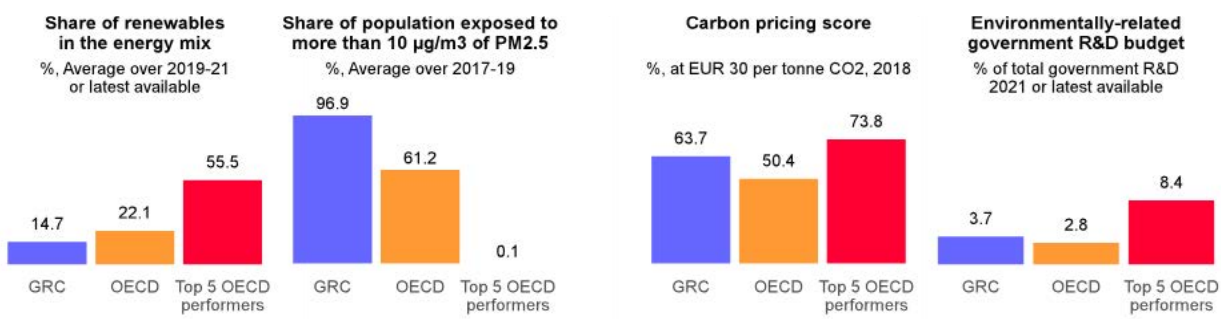
Inclusiveness, social protection, and ageing

- Poverty, especially among the young and those out of work, is high.
- Inequality is mostly reduced through pensions. Transfers reduce poverty by less and do not address barriers to enter work.
- Family policy reforms are improving the support to caregivers but still lag behind many OECD countries. Employment rates, particularly for women and the young, remain low.
- Taper the withdrawal of social benefits more gradually for those entering work and introduce in-work benefits for low-wage workers.
- Promote women's participation in paid employment by encouraging the provision of more flexible work arrangements.
- Improve incentives to hire young workers with limited experience, by waving employers' social security contributions for new hires.

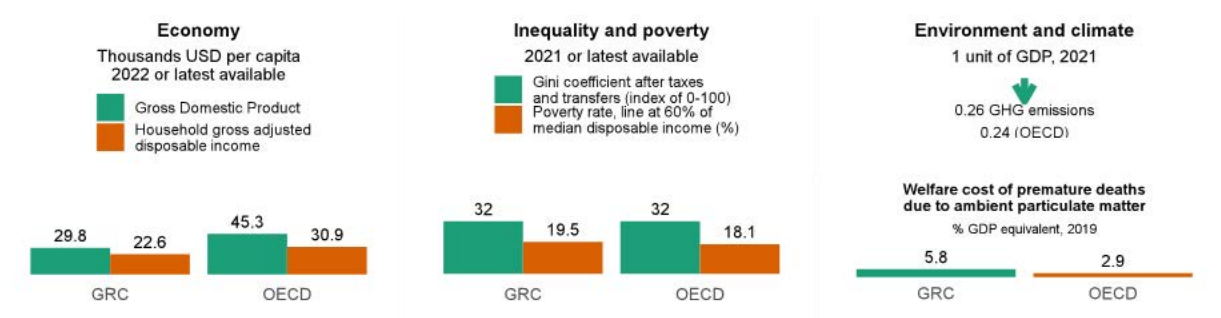


Climate transition

- GHG emissions have declined but further progress is required. Greece's economy is more carbon intensive than most OECD economies. Large investments are needed to shift to renewable sources and adapt energy use, which the Greece 2.0 Recovery and Resilience plan takes steps to implement.
- Carbon prices are high on average but fragmented across fuel uses.
- Improving the energy efficiency of older housing will help contain energy consumption, cut emissions and reduce energy poverty.
- Once energy market prices stabilise, gradually raise prices for emissions not covered by the EU emission trading scheme to a floor that is consistent with reaching net zero.
- Mandate a timeline of tightening minimum energy efficiency standards, to be applied to all existing buildings by 2050.
- Substantially upscale support for renovations, by using greater private financing through interest-subsidised loans that can be repaid via energy savings.



Overall performance



HUNGARY

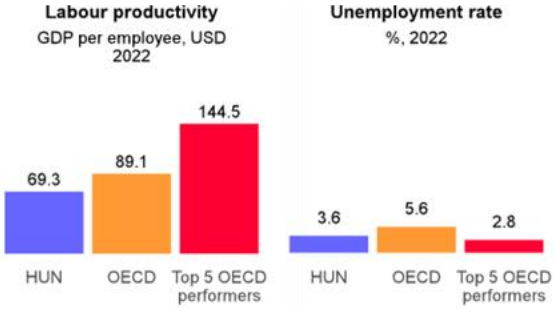
Performance gaps

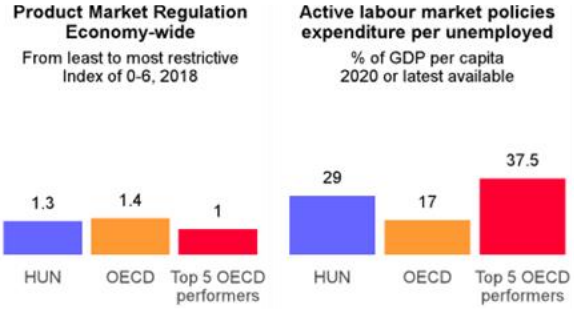
Recommendations

Product and labour markets functioning

- Productivity differences are large between capital-rich and investment intensive foreign owned companies that compete on world markets, and domestic capital poor and low-productivity firms, with low investments focusing on home markets and few connections to international supply chains.
- The pro-competitive regulatory framework is little used. The competition authority is not sufficiently active in sectors with high risk of collusion.
- Firm entries and exits are consistently low, pointing to weak competition. This has allowed low-productivity firms to maintain disproportionally large market shares.

- Reduce turnover-based sectoral taxes that hinder entry and expansion of productive firms.
- Enhance anti-corruption oversight to ensure better use of public resources.
- Increase funding for the competition authority to adequately enforce regulations and for retaining highly specialised experts. Revise sector specific exemptions from competition scrutiny on grounds of national strategic interest.
- Reform costly and lengthy insolvency procedures.

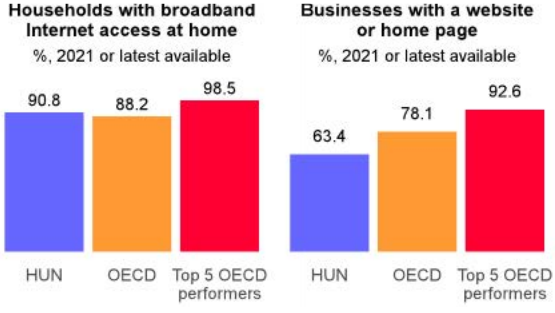


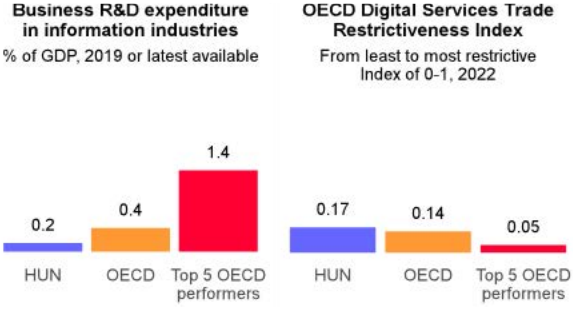


Digital transition

- Low digitalisation reflects lagging adaptation of digital technologies in smaller firms and by the public sector.
- Overall business adaption of high-speed broadband is also less than elsewhere. Digital preparedness is low, hindering the implementation of new technologies and the integration into international supply chains.
- Mobile internet prices are also high, hampering mobile broadband usage.

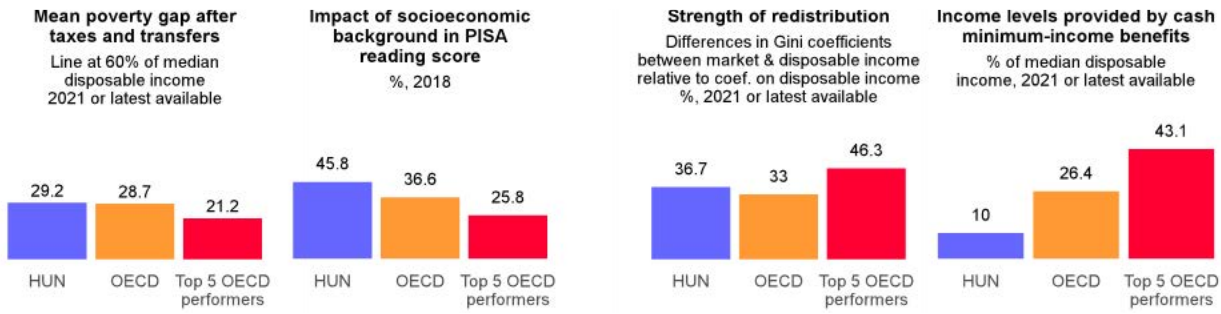
- Prioritise the adaption of digital technologies in the public sector to lead digital transformation in other parts of the economy.
- Reduce high mobile internet prices, which impede mobile broadband usage.
- Phase out taxes on phone call minutes and text messages.





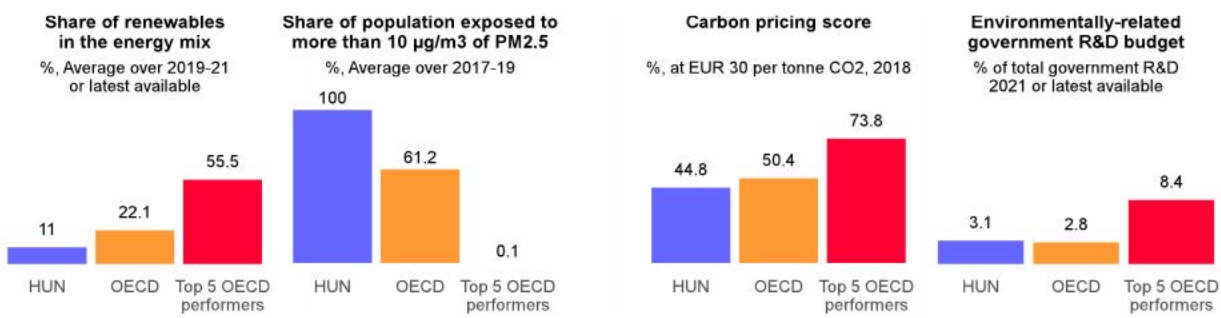
Inclusiveness, social protection, and ageing

- Employment among young mothers is low due to limited availability of early school places and childcare facilities.
- Local train networks are underdeveloped, and local roads are poorly maintained, hampering labour market inclusion and adding to regional economic disparities.
- The pension system has a large variation in benefits and entails a high risk of old-age poverty.
- Expand the availability of affordable, high-quality childcare.
- Increase investment in local train networks. Expand funding for maintenance of secondary and tertiary roads.
- Introduce a basic state pension as well as flexible retirement schemes for those beyond retirement age, to allow a combination or work and pension entitlements as an alternative to full retirement.

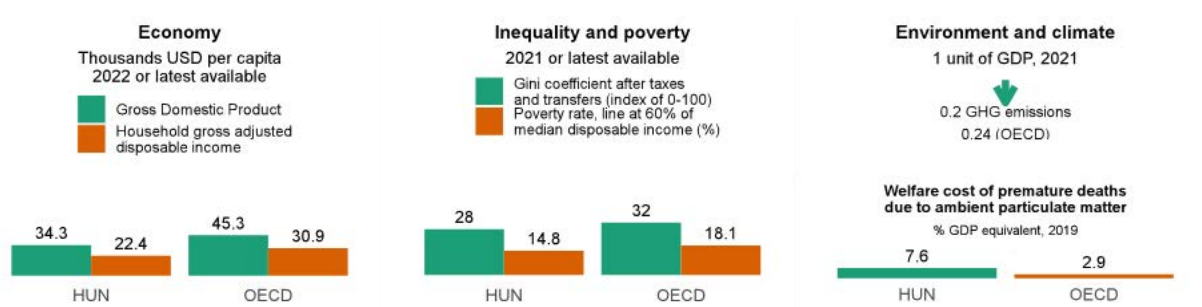


Climate transition

- Additional policies are needed to align with the EU's new and more ambitious target of a 55% reduction in GHG emissions by 2030.
- A combination of subsidies and varying tax rates in energy results in relatively low effective tax rates on CO2 and high abatement costs.
- Adjust taxation and subsidies on polluting activities to be more directly in line with their environmental damages, and follow the polluter pays principle to promote more sustainable economic growth.
- Enhance programs to improve energy and thermal efficiency of the housing stock. In line with the EU energy performance directive.



Overall performance



ICELAND

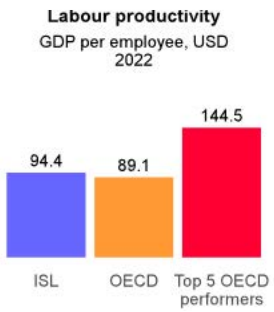
Performance gaps

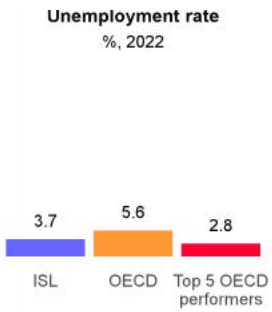
Recommendations

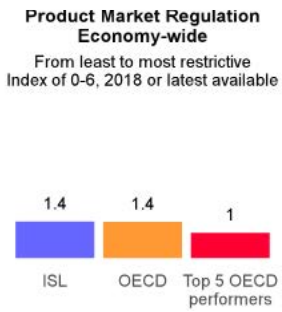
Product and labour markets functioning

- Barriers to entry are high for both domestic and foreign firms, hampering sound competition.
- Considerable administrative burdens for new companies protect incumbents and restrict the entry and growth of innovative start-ups.
- Regulation of professional and personal services is also relatively restrictive. Many activities require multiple professional designations, compounding the burden on professional entrants, especially in tourism and construction.

- Reform the regulatory framework in the tourism and construction sectors to facilitate entry of new and innovative firms.
- Ease or remove stringent occupational licensing to facilitate access to professions.
- Increase openness by easing restrictions on foreign-owned companies, public procurement, and auditing.



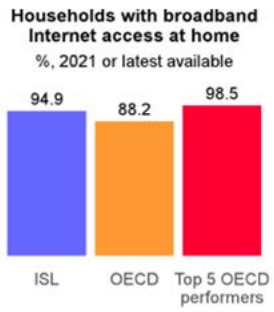


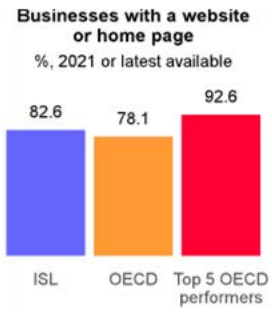


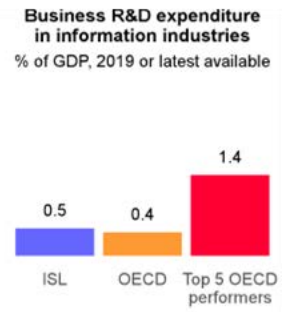
Digital transition

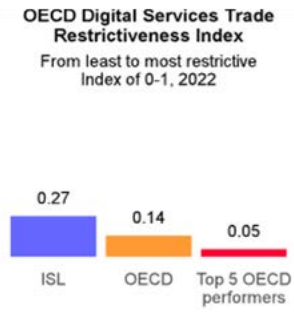
- Iceland has an excellent digital infrastructure, with the fibre network ranking at the top of European countries. However, digital uptake of firms, especially small ones, often remains weak, partly because the education system provides relatively few digital skills.
- The scope of digital government lags the OECD.

- Foster digital skills by broadening education programmes at the secondary and tertiary level, particularly in vocational education and training.
- Strengthen collaboration between research and businesses, including specific programmes that connect smaller firms with researchers.



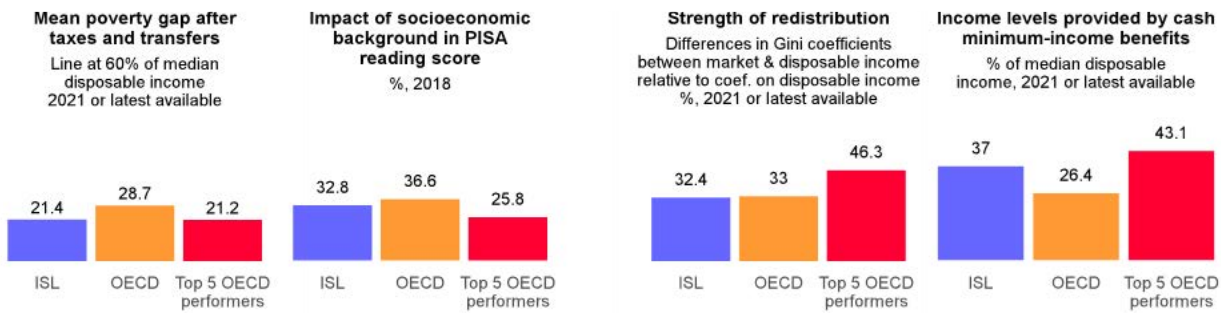






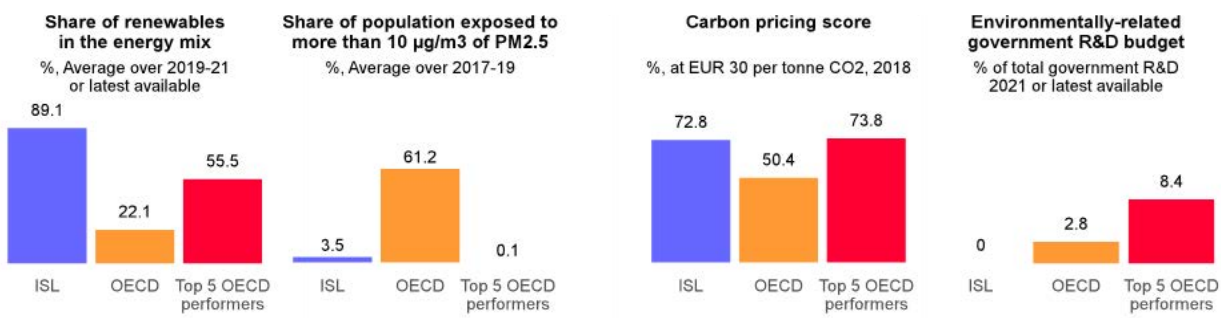
Inclusiveness, social protection, and ageing

- Iceland has the most equal income distribution in the OECD thanks to highly equal wages and a well-targeted tax and social benefit system. However, marginal tax rates for low- and middle-income earners are high. The large difference in working hours between men and women brings about a considerable gender wage gap.
- Spending on disability is high.
- Reduce high marginal tax rates on second earners, often women, for instance by moving towards a universal child benefit.
- Continue the reform of the disability benefit system, putting emphasis on returning to and remaining in work.

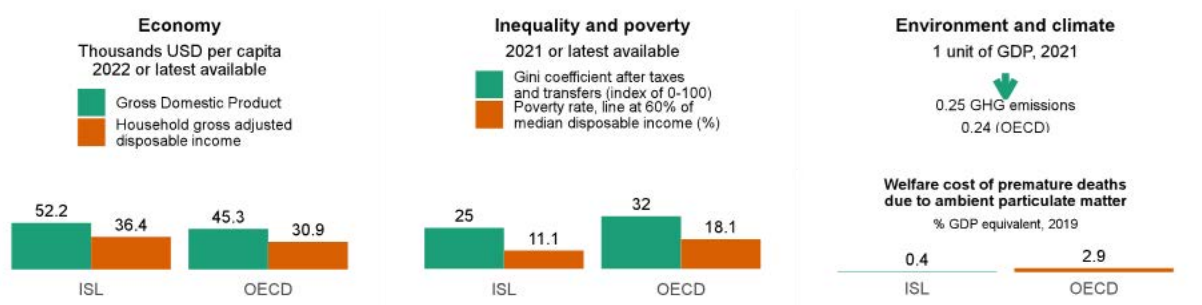


Climate transition

- Although Iceland relies far more on renewable energy than any other OECD country, greenhouse gas emissions are above average and hardly declining. Carbon pricing is above the OECD average, but geothermal energy generation and agriculture are exempt. Investment in research and development and in low-carbon infrastructure is relatively weak.
- Submit all sectors outside the European emission trading system to carbon pricing, considering interactions between carbon taxes and emissions trading.
- Step up spending on low-carbon transport infrastructure, energy transition and digital transformation.



Overall performance



INDIA

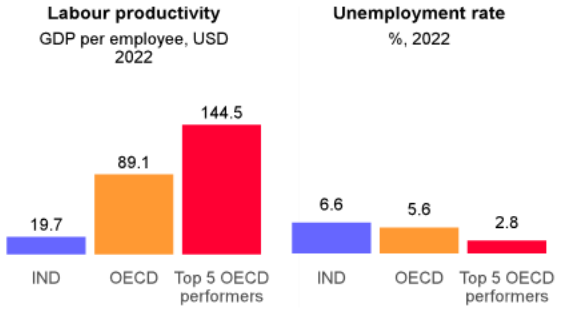
Performance gaps

Recommendations

Product and labour markets functioning

- Recent reforms reduce government participation in the finance sectors, allowing greater foreign participation in insurance, as well as defence, petroleum and natural gas, and telecoms. However, in the last few years private conglomerates have increased their role in the economy, with negative consequences for competition.
- Despite the reduction in non-performing loans and the creation of an asset reconstruction company (so-called 'bad bank'), resolution procedures remain slow.

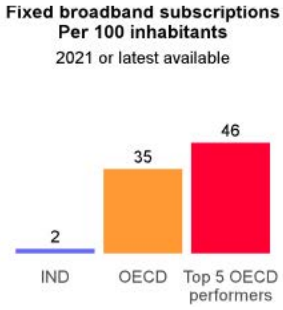
- Enhance resilience in the financial sector by accelerating the Insolvency and Bankruptcy Code process, managing nonperforming assets, and providing appropriate government's supervision.
- Further promote structure reforms in the financial sector by reducing government ownership of banks and insurance companies.
- Further liberalise FDI by removing remaining restrictions and simplify the government approval system.
- Promote the creation of quality jobs by modernising labour regulations and skill development programmes.

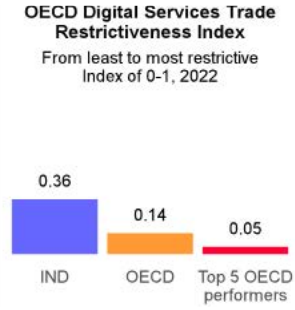


Digital transition

- Despite high mobile telephony penetration and the success of public policies promoting digitalisation of government services finance, education, and health, as well as delivery of social services, large digital divides persist by location, gender, age, income and wealth, and firm size.

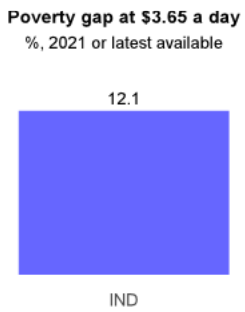
- Enhance access to affordable and secure high-speed broadband networks and service in rural areas and for micro, small and medium enterprises (MSMEs), and poor households.
- Boost digital literacy and skills development through education and training, including among women and marginalised groups.





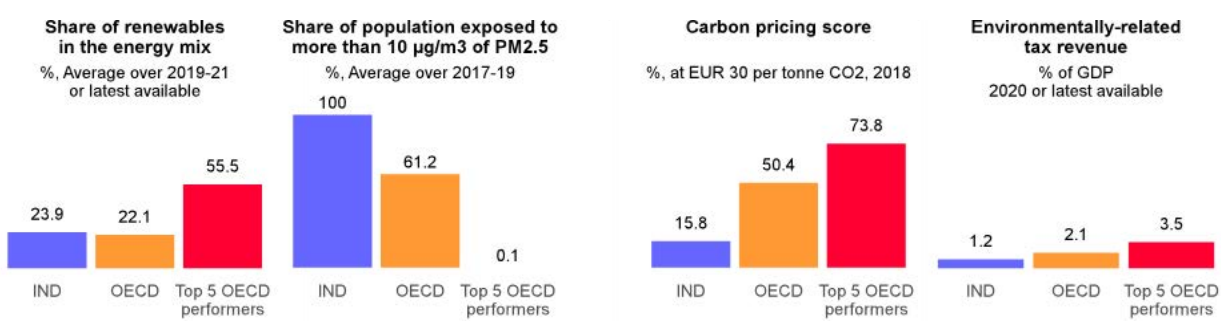
Inclusiveness, social protection, and ageing

- Both monetary and multidimensional poverty rates have declined, at least before the pandemic. Inequality of opportunities and social protection remains a challenge, with migrant workers and women (notably widowers) being particularly vulnerable due to poor competencies and skills. The 2022 Right to Education Act introduced the obligation to provide free and compulsory education for all children from age 6 to 14, but actual coverage is lower and quality is lagging behind.
- Enhance social mobility by widening access to social services and infrastructure, especially ensuring equal access to high quality education to all children at least from 6 to 14 for the successful implementation.

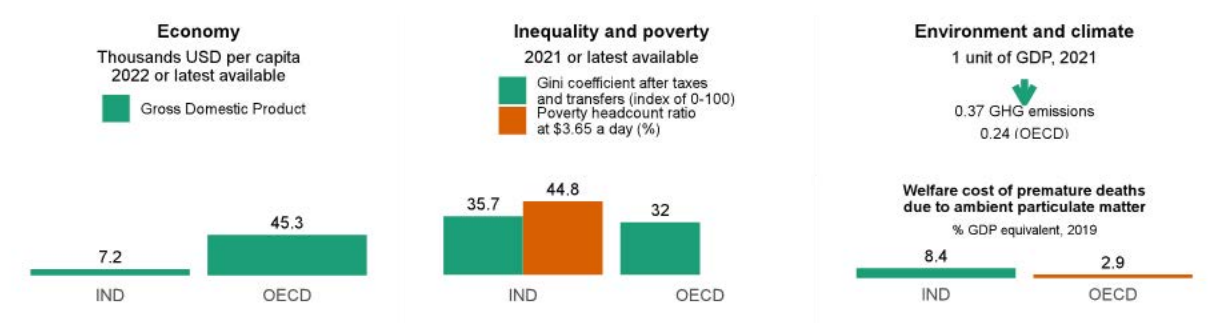


Climate transition

- India has committed to reduce greenhouse gas emissions and increase the share of renewable energy. Nonetheless, the energy mix is still highly dependent on fossil fuels and coal, the import bill has increased, and energy efficiency is low.
- Air pollution, extreme weather episodes, and droughts are becoming increasingly problematic.
- Further increase the share of renewable energy by facilitating long-term investment in clean energy development projects.
- Improve the performance of state-owned distribution companies (DISCOMs), so as to reduce the risks faced by private firms entering the renewable energy market to sell to DISCOMs.
- Incentivise private sectors to adopt more energy efficient and less carbon-intensive measures through carbon pricing, subsidies, technology dissemination, training, and capacity building.
- Provide additional government's support to shift household cooking fuels from biomass-based to less-carbon intensive sources.



Overall performance



INDONESIA

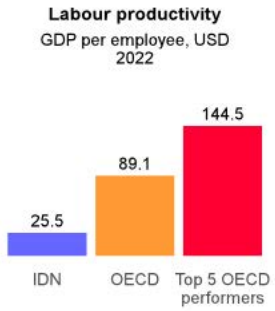
Performance gaps

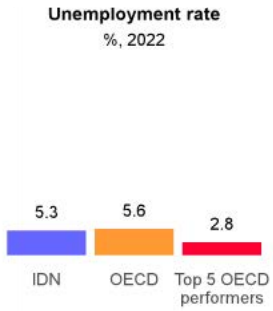
Recommendations

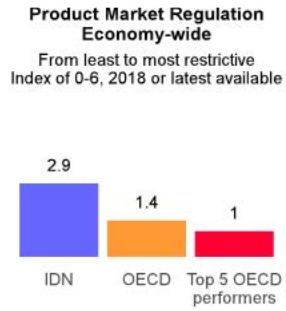
Product and labour markets functioning

- Barriers to private sector investment and productivity, including competition exemptions for state-owned enterprises (SOEs), are far more severe than in comparable countries, making Indonesian firms less productive, less innovative, and less integrated into global value chains.
- High logistics costs and inefficient border practices hamper exports and sap economic resilience. Recent trade and investment reforms have reduced the distance to the OECD average in terms of restrictiveness, but further progress is warranted.

- Remove remaining private and foreign investment restrictions.
- Improve the trade environment (policies and physical infrastructure) and devote more resources to trade facilitation.
- Reduce state-owned enterprises' wide-ranging privileges and accelerate privatisation and governance reform.



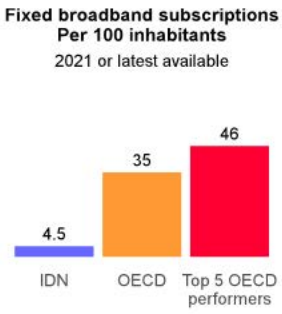


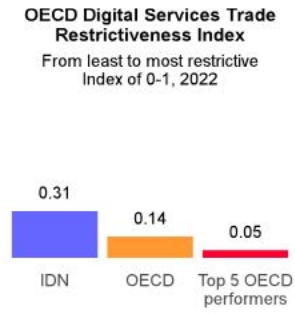


Digital transition

- Despite high mobile telephone penetration rates and a promising start-up ecosystem, Indonesia lags behind its peers in the quality and range of digital services.

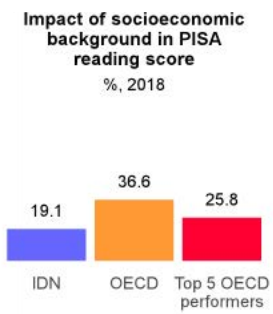
- Remove barriers to competition in the ICT sector, notably by introducing number portability and establishing an independent telecom regulator.
- Develop a comprehensive strategy that addresses mobile internet needs, cloud technology, the internet-of-things, and big data analytics, jointly with infrastructure investments.





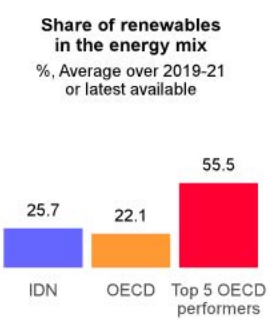
Inclusiveness, social protection, and ageing

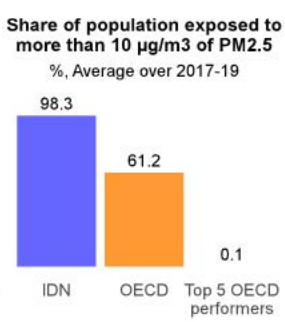
- Despite declining poverty rates and improving well-being results, at least before COVID-19, resilience to economic, social, climate, or health-related shocks is insufficient. Making growth more inclusive will depend on widening access to health, education, and vocational training, as well as public infrastructure such as water and sanitation.
- Gender gaps are more severe than in peer economies in particular for female labour participation, remuneration and advancement.
- The Village Fund has positively impacted on some health and well-being outcomes (e.g., stunting cases), but the increase in funding and expanded responsibilities did not immediately translate into different investments and spending patterns.
- Improve regulatory coherence and consistency, reduce the administrative burden on village governments and enable larger, village-wide projects.
- Make social assistance schemes more effective and efficient, in particular by mainstreaming gender-specific criteria.
- Invest in rural infrastructures, in particular water supply and sanitation, which has strong poverty reduction effects via health, nutrition and stunting.
- Improve the quality of spending and investments of Village Funds through greater inclusion and participatory poverty mapping.

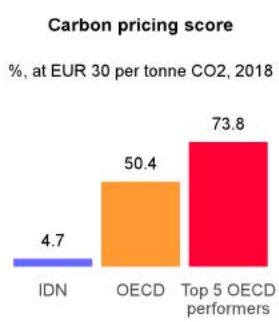


Climate transition

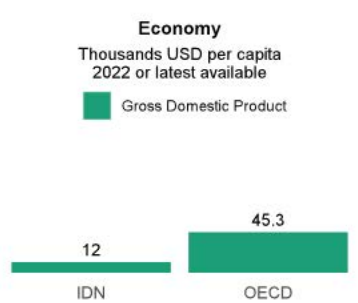
- Climate change and natural resources degradations are producing severe impacts, which disproportionately hit the most vulnerable. The interaction of those with the pandemic threatens to create potentially permanent scars on productivity, human capital and economic mobility.
- Sustainable development requires cost-effective ways to achieve mitigation goals, while mobilizing private sector finance and taking into account citizens' priorities.
- Enhance carbon pricing instruments, such as carbon tax and domestic emission trading system.
- Promote greater participation in policy process on natural resources management, embracing civil society organisations and local communities.
- Facilitate private-public partnerships in green infrastructures.

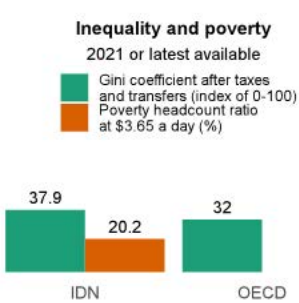


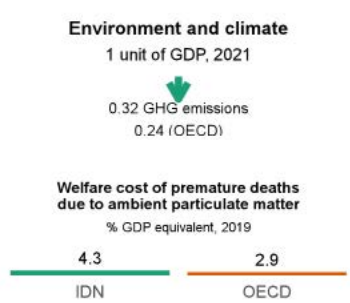




Overall performance







IRELAND

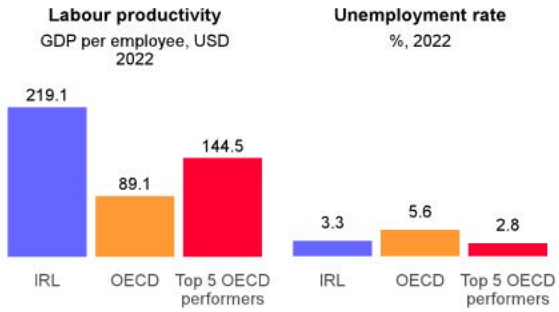
Performance gaps

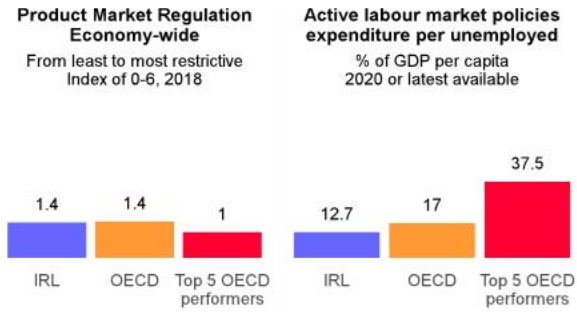
Recommendations

Product and labour markets functioning

- Planning and permitting delays, as well as judicial reviews, constrain housing supply, exacerbating housing affordability challenges.
- There is room to promote greater business dynamism and increased uptake of new technologies.
- Regulatory burdens on start-ups are relatively onerous, due to complex regulatory procedures and the system for licenses and permissions.

- Streamline planning and judicial review processes, for example by establishing a special division in the High Court with sufficient tools, resources and technical capacity to reduce delays.
- Continue to reduce the administrative burdens on SMEs by creating a Single SME portal, as planned.
- Monitor business licensing requirements and the systems that facilitate them, including by linking more licensing procedures with the Integrated License Application Service.

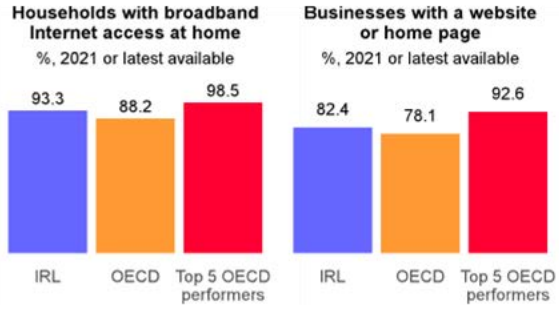


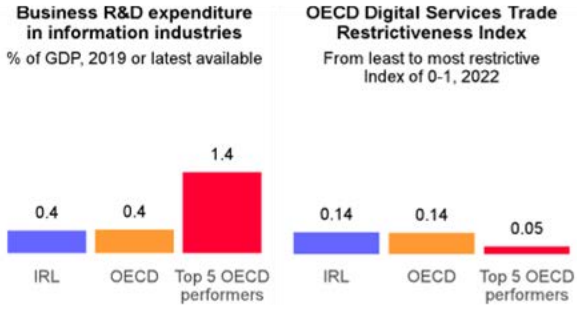


Digital transition

- The use of digital government services is relatively low, and the intangible capital intensity of public administration has declined.
- The health system is complex, with lack of adequate information and a fragmented data governance hampering the effective monitoring of healthcare spending.

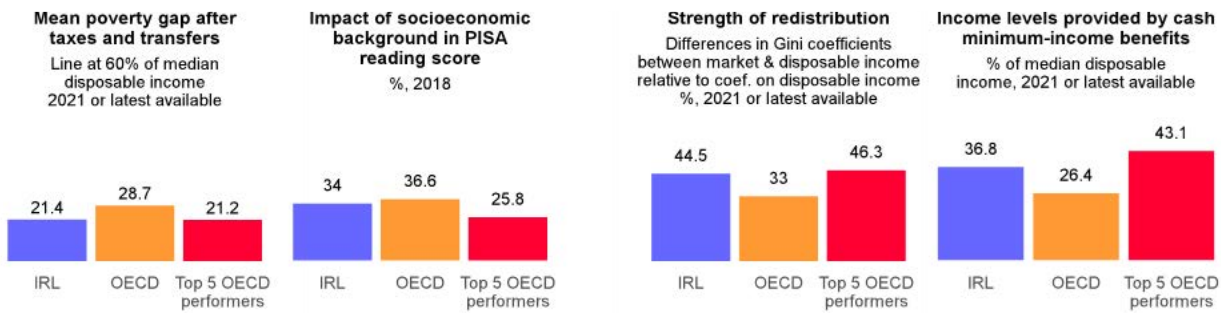
- Introduce the "digital postbox" system, allowing for easier and secured digital correspondence between the government and citizens, and develop new digital government services that improve citizens' interactions with public administration.
- Prioritise the adoption of the Unique Health Identifier and centralise the management of health information in a single, independent body.





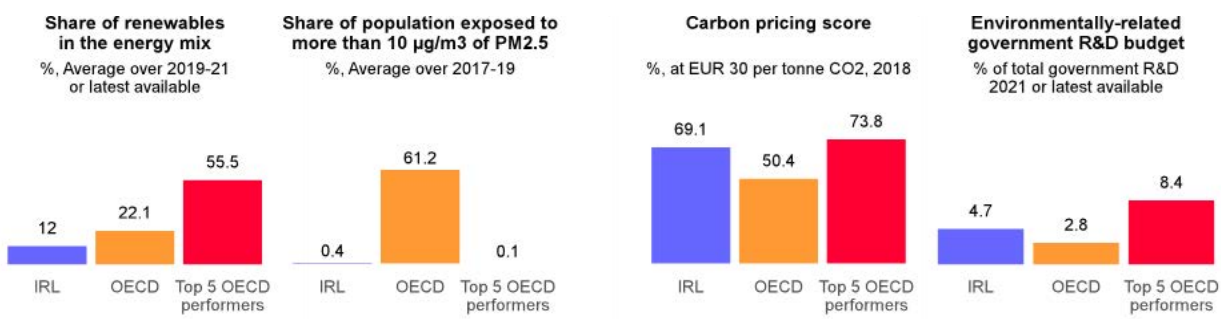
Inclusiveness, social protection, and ageing

- Population ageing is putting significant pressure on medium-term fiscal sustainability. The recent pension reform puts the burden of adjustment on social security contributions.
- Some segments of the population, notably those with lower educational attainment, continue to have weak attachment to the labour market. The marginal tax wedge on low-income families is high, creating disincentives for employment.
- Introduce a rise in the state pension age.
- Consider introducing more tax rates and bands to prevent income threshold effects that create disincentives to work, combined with targeted means-tested support to vulnerable households.
- Target training and apprenticeship support to those with lower educational attainment, especially in areas of the economy where labour supply is in high demand.

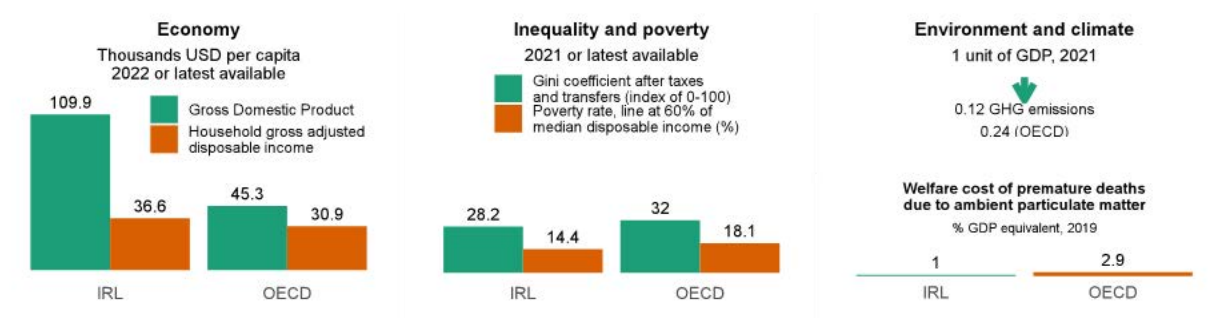


Climate transition

- Planning and permitting delays coupled with judicial review concerning major investments slow the development of renewable energy capacity and increase uncertainty, which deter investment and raise prices.
- The share of agriculture in emissions is high at around 38%. If agriculture does not contribute more to emission reductions, the additional abatement costs will rise substantially for other sectors.
- Reducing emissions in the transport sector requires action across many policy dimensions.
- Expedite the planning process to reduce uncertainty concerning major investment in wind turbine capacity.
- Ensure that farmers face stronger economic incentives to reduce emissions in line with the rest of the economy, such as by pricing methane emissions.
- Realign transport policies to reduce private car ownership and facilitate the provision and use of low or no carbon travel alternatives.



Overall performance



ISRAEL

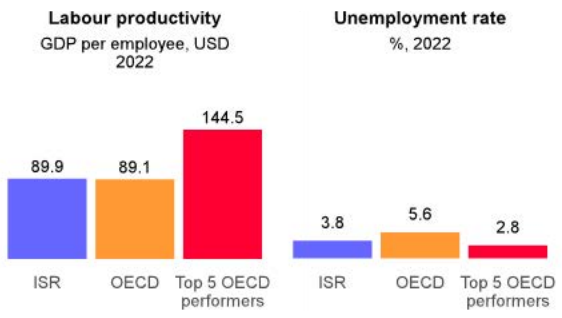
Performance gaps

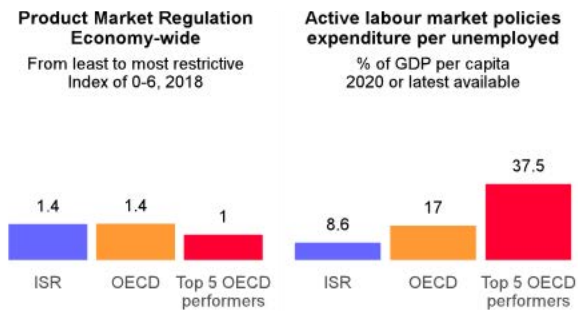
Recommendations

Product and labour markets functioning

- Despite significant progress, barriers to foreign trade and investment remain high, with Israel's foreign trade exposure lower than in other small OECD countries. Fostering competition can strengthen incentives to adopt new technologies.
- The electricity market reform of 2018 has established the framework for a wholesale electricity market. High-resolution electricity pricing can help adapt to intermittent renewables supply.

- Further cut tariffs and non-tariff barriers and streamline trade regulations.
- Further develop the wholesale electricity market as planned, with high-resolution pricing across time and space, and competitive determination of market prices.

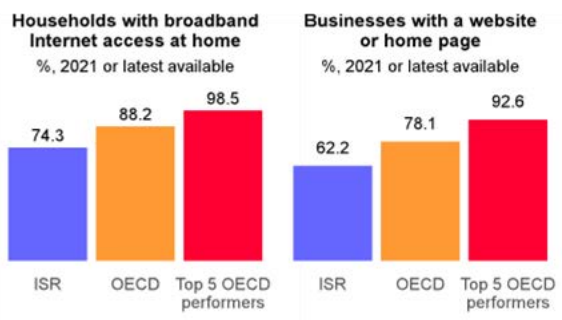


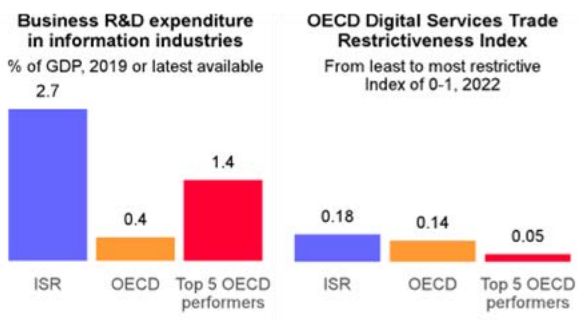


Digital transition

- Business R&D spending is the highest in the OECD, driven especially by ICT sectors. However, gaps in internet use across population groups remain wide and firms lag in the adoption of advanced digital technologies especially in traditional sectors. Reducing these gaps can boost productivity growth and narrow the productivity divide between the high-tech sector and the rest of the economy.

- Closely monitor the deployment of fibre broadband connections in underserved areas and align subsidies with actual deployment costs if needed.

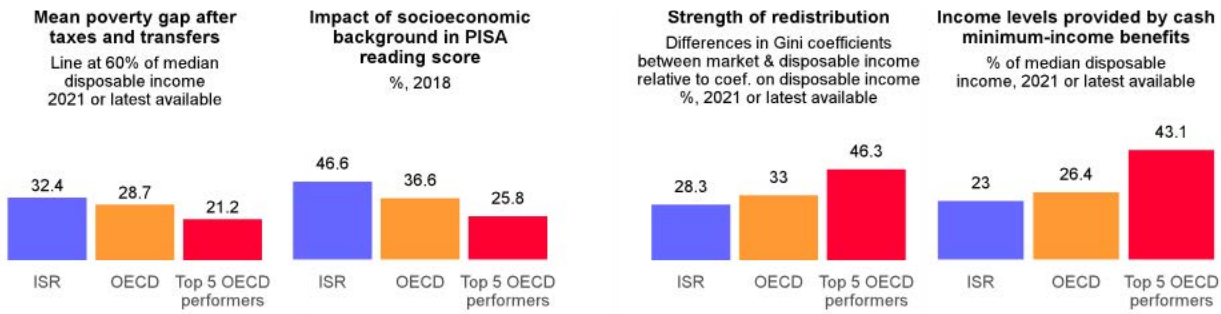




Inclusiveness, social protection, and ageing

- Socioeconomic gaps remain wide. The duality in the business sector contributes to large labour market inequalities.
- Certain groups, especially the Haredim (ultra-Orthodox Jews) and Arab-Israelis, are underrepresented in the thriving high-tech sector, and have low employment rates, working hours and wages.
- The share of working poor is high

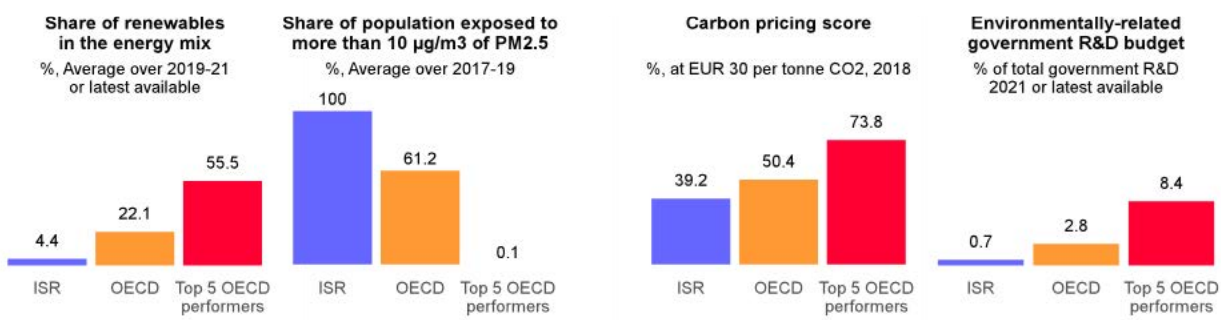
- Remove government subsidies for yeshiva students and condition childcare support on fathers' employment.
- Increase the provision of accredited child-care in Arab municipalities and funding for Arab schools to equalise their budget to schools with similar socio-economic profiles in the Hebrew sector.
- Permanently re-introduce the bonus for second earners to the Earned Income Tax Credit.



Climate transition

- The carbon intensity of the economy declined but emissions are still a long way from targets. Overall, only about a third of carbon emissions from energy use are taxed at EUR 60 or above.
- The share of renewable energy in electricity generation is one of the lowest in the OECD.

- In the medium term, increase the excise taxes on non-transport fuels to reflect environmental costs.
- Partially use environmental tax revenues to mitigate distributional impacts, enhance energy efficiency and improve public transportation.
- In the medium-term introduce consistent carbon pricing across all sectors.
- Streamline permit procedures and increase public land available for utility-scale solar installations while further strengthening incentives for dual-use solar installations.



Overall performance

ITALY

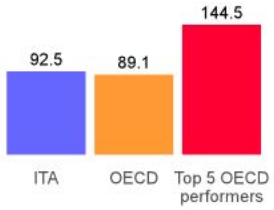
Performance gaps

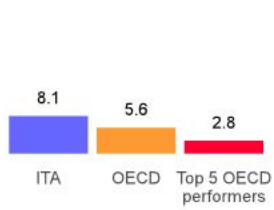
Recommendations

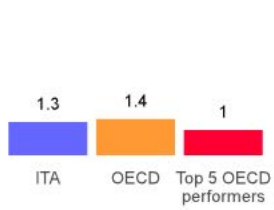
Product and labour markets functioning

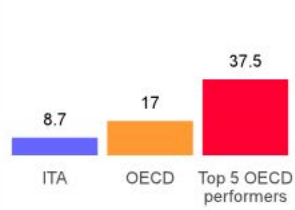
- Outdated laws impairing competition in some sectors, a pervasive informal economy and disincentives for micro firms to grow hamper productivity growth. Reforms are needed to unlock the economy's potential.
- Italy's participation and employment rates remain low compared to OECD peers, particularly in the country's South and among women.

- Foster competition, especially in services, by ensuring full and speedy implementation of the competition reform approved in 2022.
- Reduce the labour tax wedge by shifting taxation away from labour towards immovable property.
- Increase employment and competitiveness of lagging regions by allowing wages to be negotiated at the regional rather than the national level.
- Tighten requirements for early retirement to boost labour force participation and improve the financial sustainability of the pension system.
- Reduce second-earner marginal tax rates and boost public childcare provision to foster women's labour market participation.





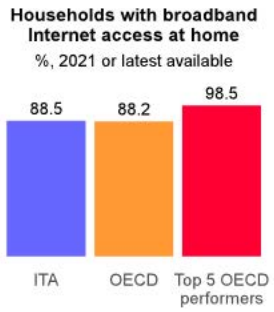


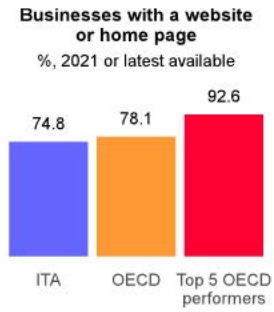


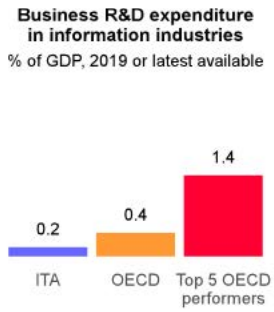
Digital transition

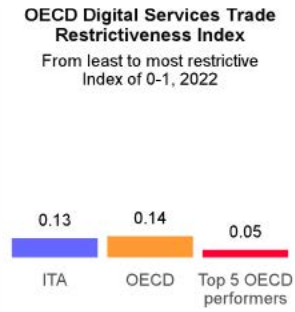
- Digital literacy, broadband penetration and the take-up of digital services are low.
- The digitalisation and exchange of data across government bodies is limited, hampering the capacity to monitor and evaluate public.

- Support quicker rollout of fast broadband by simplifying infrastructure authorisation processes and designating ultra-high-speed infrastructures as strategic.
- Standardise and simplify applications and approval processes for courses provided by training funds to increase take-up among SMEs.
- Continue the digitalisation of the public administration, allow exchange of data according to GDPR, and further promote the usage of digital government services.



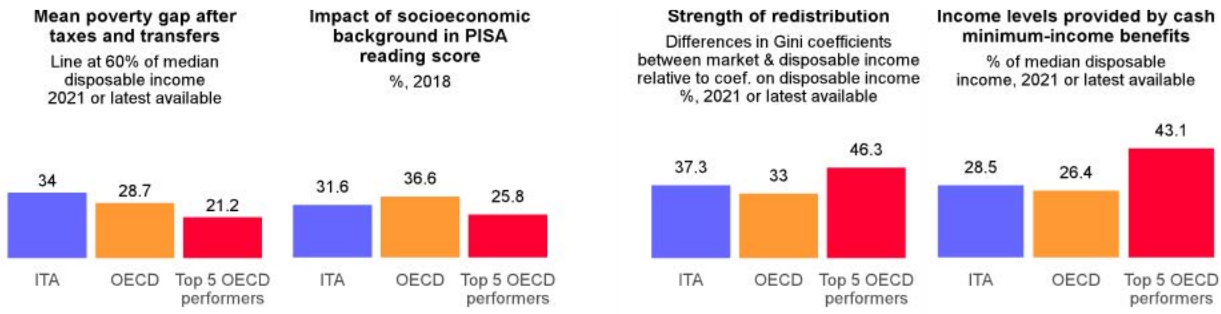






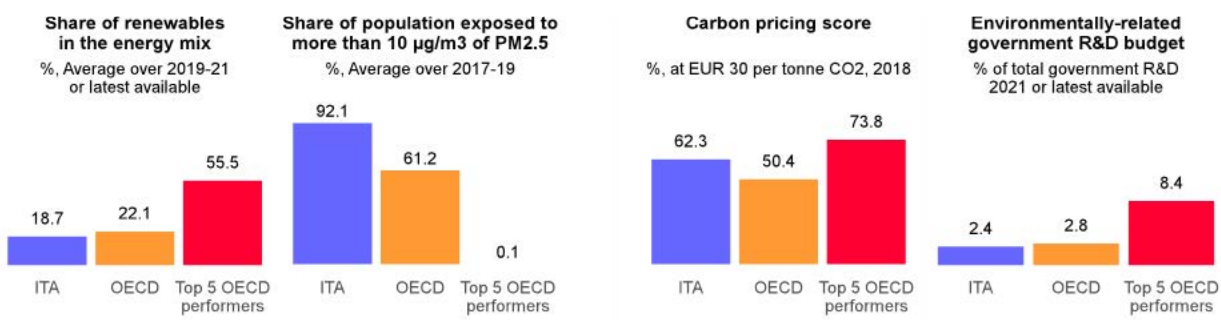
Inclusiveness, social protection, and ageing

- Notwithstanding high redistribution achieved through the tax and benefit system, the share of people living in poverty is increasing and the depth of poverty, measured as the distance from the poverty line, is high.
- To reach those most in need, a review of the requirements to access social protection programs and the simplification of access procedures is warranted.
- Reduce coverage gaps of social protection programmes by reviewing residency-based eligibility conditions.
- Reduce gaps in take-up by simplifying and standardising application procedures across different programmes.
- Promote labour market participation among recipients of social benefits, including the citizens' income by making benefit withdrawal more gradual.

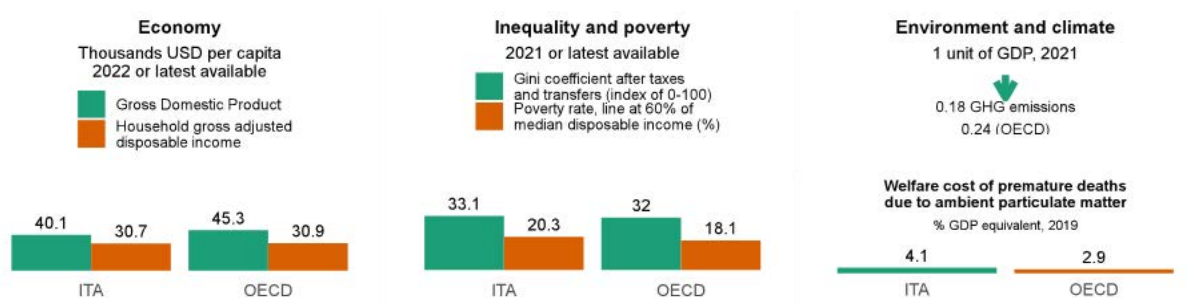


Climate transition

- Despite being highly exposed to climate change, Italy is lagging behind other countries in terms of emission reductions, renewable energy diffusion and environmentally related R&D spending as a share of GDP.
- Air pollution, particularly in the North's industrial heartland, is high.
- Streamline and simplify authorisation procedures and ease general administrative burdens for renewable energy projects.
- Encourage low-carbon technology innovation by increasing public R&D investment and expanding tax credits for private R&D.
- Promote the take-up of electric mobility by accelerating the rollout of charging stations and phasing out subsidies for the purchase of cars with internal combustion engines.
- Adopt and implement the National Plan for Climate Change Adaptation to protect communities exposed to natural disasters.



Overall performance



JAPAN

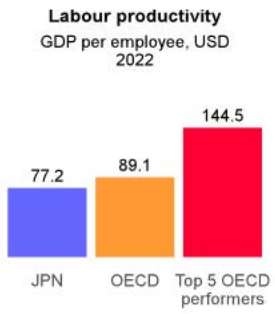
Performance gaps

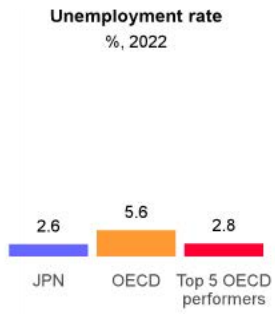
Recommendations

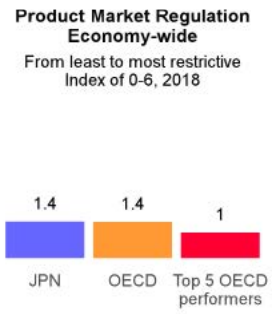
Product and labour markets functioning

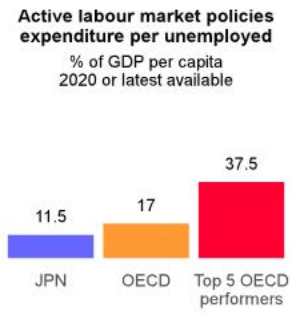
- Productivity growth has been sluggish. Business dynamism is weak, with relatively few start-ups and exits of low-productivity (often smaller) firms.
- Digitalisation, automation and the green transformation will call for new skills, which older and low-skilled workers need support in acquiring, but firm-based training is relatively underdeveloped.

- Expand access to entrepreneurial training and finance, in particular for women.
- Encourage mergers, acquisitions, and divestitures of SMEs to promote consolidation of managerial resources in viable firms.
- Enhance job-training schemes, especially for the low-skilled and those with limited access to firm training.





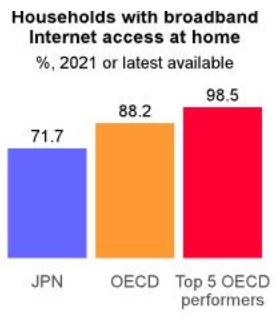


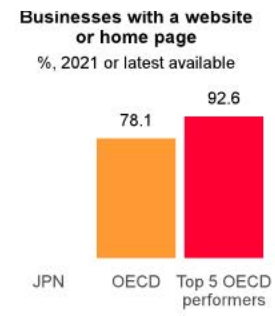


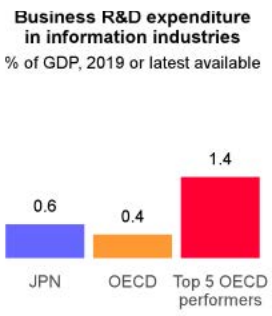
Digital transition

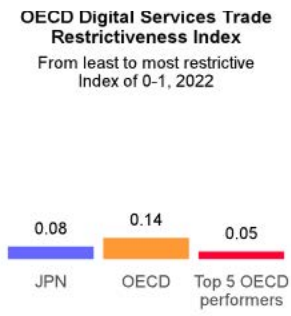
- Despite a good physical infrastructure, government use of digital technologies is limited, with fragmented databases. Investment in ICT and complementary intangible assets and workers with digital skills remains concentrated in larger enterprises.

- Raise e-government supply, service orientation and cost efficiency in the public sector, and develop interconnected databases.
- Reform STEM curricula to make them more attractive to study.
- Continue to develop financing methods for firms with high shares of intangible capital.



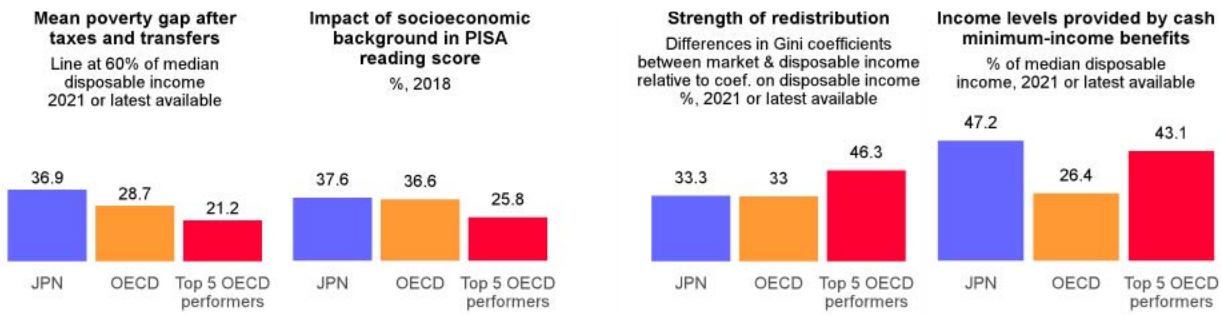






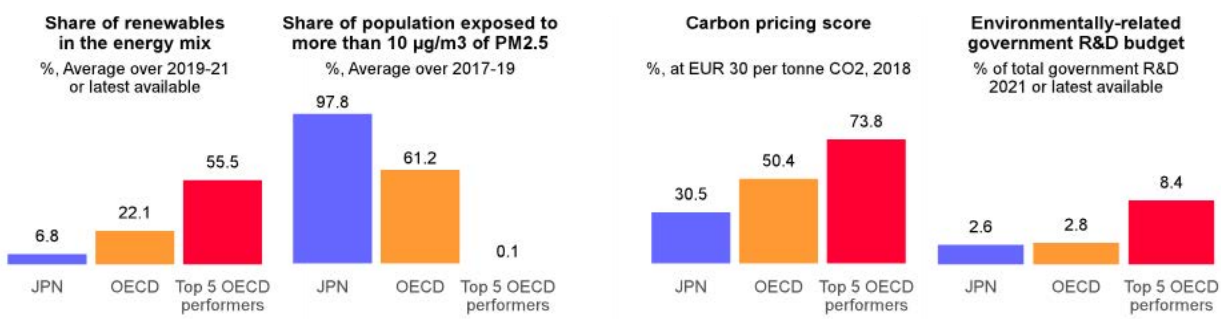
Inclusiveness, social protection, and ageing

- Demographic pressures weigh on fiscal sustainability, with rising health and long-term care expenditures, and on the outlook, reducing the inflow of new workers.
- Labour participation of women and the elderly has been increasing, but labour market duality remains high. The gender wage gap is large and the social insurance coverage of non-regular workers is lagging.
- Increase the efficiency of health and long-term care spending, including through greater use of digital technologies.
- Continue to raise the compulsory retirement age or abolish it and reform seniority wage schemes.
- Continue Work Style reforms, including equal pay for equal work and flexible working arrangements while improving child-care provision.
- Expand social insurance coverage and training for non-regular workers.

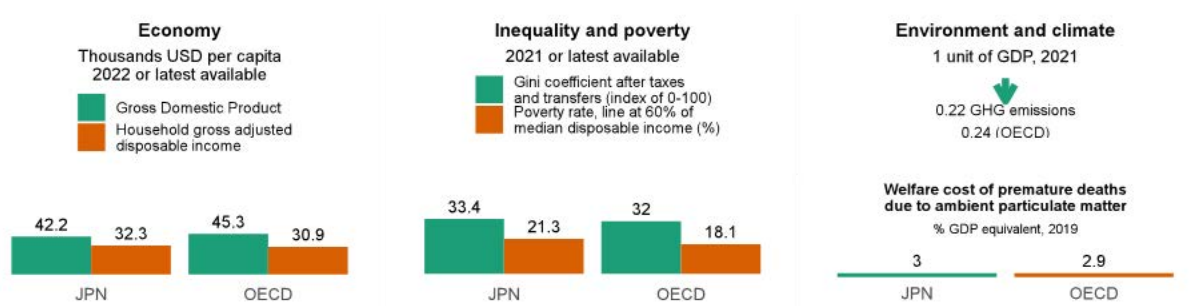


Climate transition

- Climate change objectives are challenging and will require major investment and public support in developing technologies that can contribute to emission reduction or carbon capture and storage. There is room to improve the use of market-based instruments, with a relatively low effective carbon rate.
- The contribution of renewables to electricity supply is modest and constrained by limited integration of regional electricity grids.
- Step up the promotion of research, development and deployment of green technologies and encourage greater energy efficiency.
- Make greater use of market-based instruments, such as the carbon tax, a trading system or carbon- credit market, while considering the social and economic impact.
- Invest in more interconnector capacity and ensure regional electricity grids support an increase of renewable electricity supply.



Overall performance



KOREA

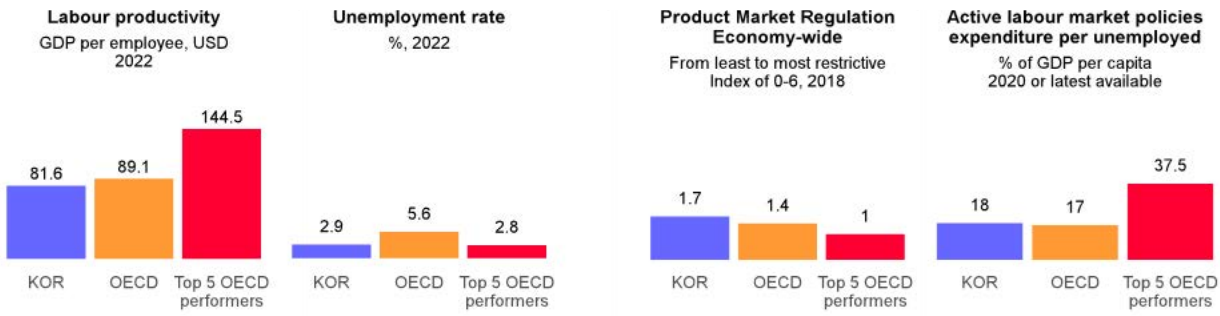
Performance gaps

Recommendations

Product and labour markets functioning

- The productivity gap between large and small firms is among the largest in the OECD. The incidence of non-regular workers is high in small companies. Regular workers in large firms receive high wages, social insurance coverage and strong employment protection relative to non-regular ones. SMEs also lag far behind large companies in the use of digital technologies. Public support for SMEs is higher than in other OECD countries, hampering productivity-enhancing restructuring.

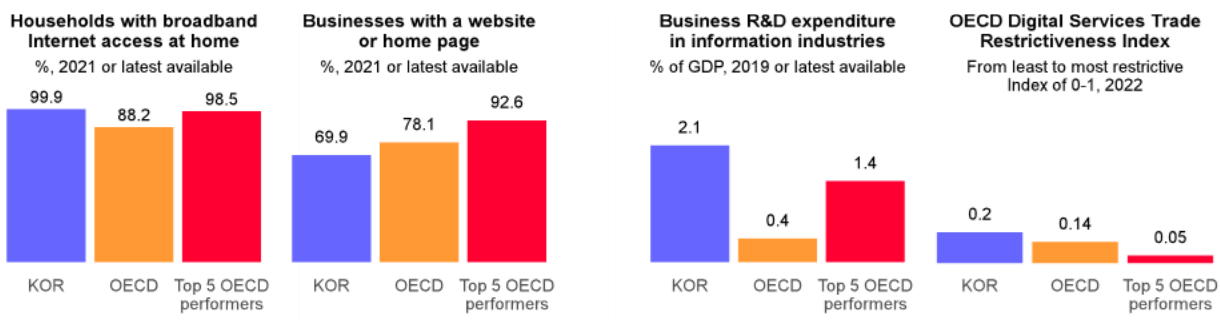
- Expand the coverage of SMEs graduation schemes to ensure that public support for SMEs encourages the growth of innovative firms.
- Break down labour market dualism by relaxing employment protection for regular workers while expanding social insurance enrolment and training for non-regular workers.



Digital transition

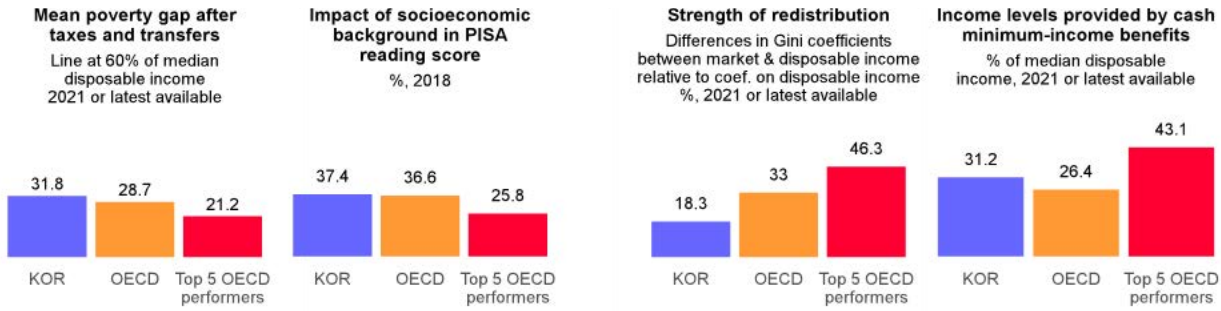
- Despite a solid digital infrastructure, the diffusion of advanced digital technologies is uneven. Digital skills of workers in SMEs and older workers are lagging, with limited access to training.
- Restrictive product market regulations hamper the development of new and digital industries.

- Provide more ICT courses to SME employees and older workers, and support training costs for SMEs.
- Reduce the restrictiveness of product market regulation by shifting to a comprehensive negative-list regulatory system and expanding the use of regulatory sandboxes.



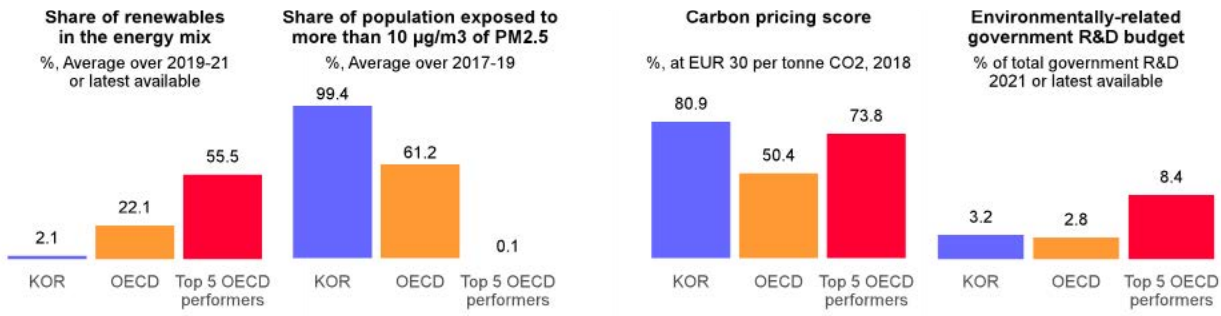
Inclusiveness, social protection, and ageing

- Income inequality is relatively high, notably with high poverty among the elderly.
- The social safety net is incomplete and redistribution through taxes and benefits is weaker than in most other OECD countries. Unemployment benefits are relatively low and social insurance coverage for non-regular workers remains insufficient.
- Gender wage and employment gaps are still relatively large.
- Pursue a broad pension reform to secure adequate old-age income and to make the basic pension better targeted to the elderly with the lowest incomes.
- Expand social insurance coverage and phase out the earned income tax credit at a higher level of earnings and at a slower rate.
- Expand public financing of parental leave.

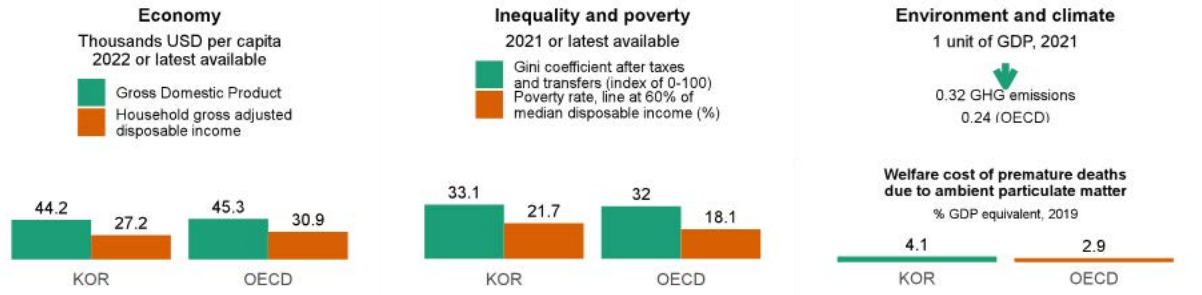


Climate transition

- While emission intensity has declined, Korea remains among the largest emitters in the OECD. Improving the institutional framework for electricity supply would allow the marginal carbon cost to pass through, enhancing the effectiveness of the emission trade scheme (ETS) for electricity generation.
- Align policies, notably the ETS, to achieve the 2050 carbon neutrality target and intermediate targets.
- Comprehensively review the institutional framework hindering the carbon price from passing through and holding back emission reductions in the electricity sector.



Overall performance



LATVIA

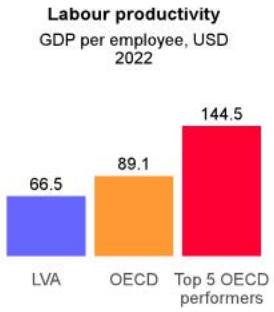
Performance gaps

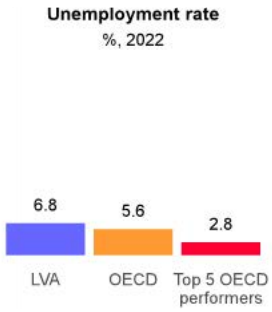
Recommendations

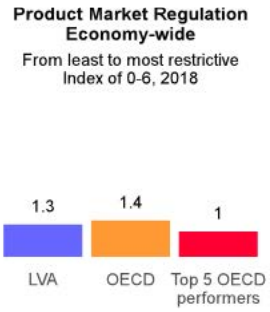
Product and labour markets functioning

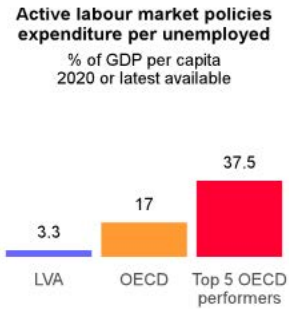
- Constrained access to finance – along with its cost and collaterals demanded – is a serious barrier to business investment.
- Despite recent progress, the quality of road infrastructure is well below the EU average, hindering the economic integration of remote regions.
- Despite recent improvements in VAT collection, tax evasion, bribery and official corruption are longstanding problems that lead to an unlevelled playing field and hinder business dynamism.

- Deepen capital markets by improving financial literacy, simplifying corporate debt restructuring through out-of-court and hybrid procedures, and reducing market entry barriers for fintech firms.
- Increase transparency in public procurement processes and enforce the heavy penalties for tax evasion and bribery that existing legislation allows.
- Improve cost-benefit analysis and the selection process for new infrastructure projects.
- Strengthen business networks to support SMEs throughout their internationalisation process.





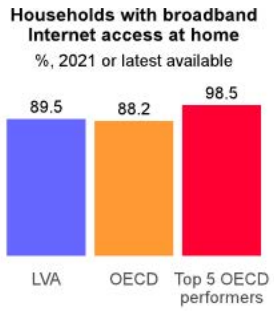


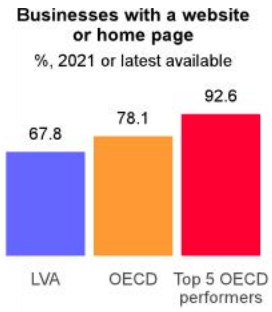


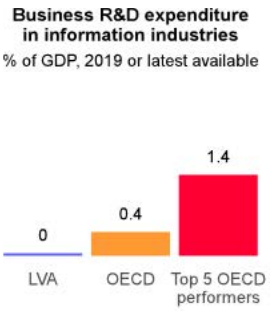
Digital transition

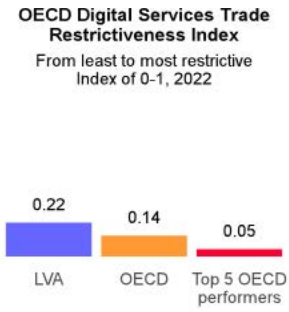
- The framework conditions for innovation are weak, with limited private-sector adoption of digital technologies, low-quality higher education institutions with few doctoral graduates, and very low R&D spending in relation to GDP, especially by the business sector.
- A low level of basic digital skills is limiting the uptake of advanced digital technologies.

- Accelerate government collaboration with training providers to support the skills needed for the adoption of digital technologies.
- Improve the financial incentives for business R&D after evaluating the impact of the 2018 corporate tax reform.
- Allow academic researchers a share in royalties earned from their research.



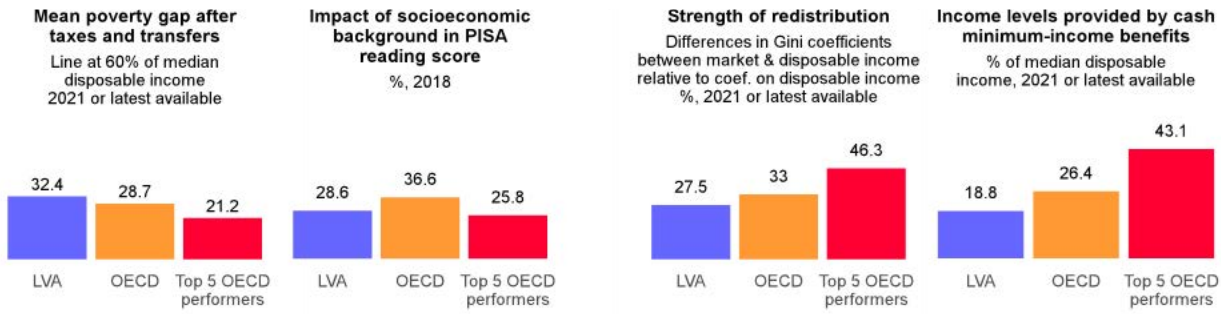






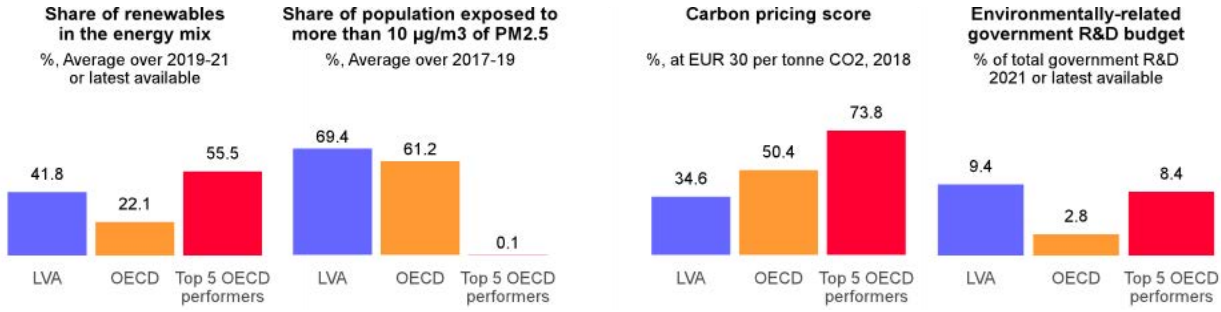
Inclusiveness, social protection, and ageing

- Labour shortages are mounting but long-term unemployment rates are high, particularly in specific regions. Only about half of the unemployed receive unemployment benefits.
- Pervasive business informality and underreported wages result in lost training opportunities, pension rights and tax revenues. The provision of employer-provided training is insufficient.
- Public health-care spending is low, leading to high out-of-pocket spending, low treatment quality and patient satisfaction, and low-life expectancy. Old-age poverty is high.
- Expand active labour market policies, focusing on vocational education and training and adult education, while providing unemployment benefits during training periods.
- Establish training funds based on tripartite social dialogue to improve employer-provided training.
- Boost government healthcare spending, widen public insurance coverage and reduce the cap on individual contributions.
- Review minimum income thresholds on a regular basis, and raise benefits for vulnerable groups, notably the elderly.

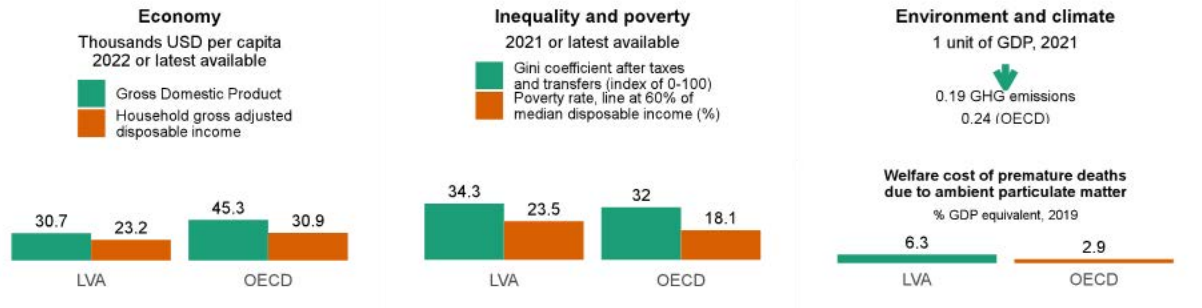


Climate transition

- Greenhouse gas emissions are lower than the OECD average but have not decreased since the 2000s. Most emissions are not covered by the European Union's Emissions Trading System (EU ETS) and the effective carbon tax rates are well below the estimated global cost of such emissions.
- Favourable tax treatment of natural gas and diesel for vehicle use lowers incentives for emission reductions.
- Gradually raise effective carbon tax rates in sectors not covered by the EU-ETS, phasing out fossil fuel subsidies and tax expenditures and redistributing revenues towards poorer households.
- Encourage greater use of renewables and continue integrating regional power and gas markets.



Overall performance



LITHUANIA

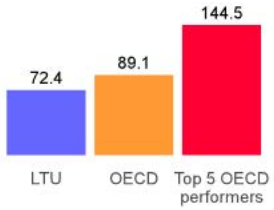
Performance gaps

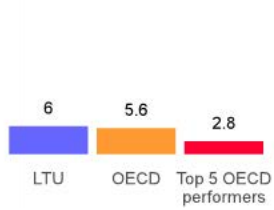
Recommendations

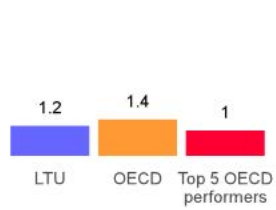
Product and labour markets functioning

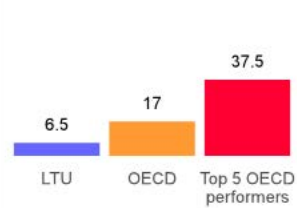
- Redeployment of resources and reallocation of capital and skills are promoted through lean, business-friendly regulation and new insolvency procedures that promote restructuring over exit. However, overly complex licensing mechanisms remain an issue.
- Twice as high a share of SMEs than the EU average reports difficulties in accessing finance. This problem is particularly acute for young innovative SMEs with high growth potential.
- The flexible labour market has helped productivity-enhancing labour re-allocation. However, many workers are under- or over-qualified for their jobs even as high-skilled job offers remain vacant while low-qualified workers look for jobs.

- Simplify licensing procedures in all sectors to stimulate entry of new firms.
- Engage with privately-owned venture funds rather than participating directly in the provision of venture capital.
- Create a framework for attracting, developing, upgrading and retaining skills and bringing them closer to labour market needs by: strengthening firm-based learning; better balancing the attractiveness of firm- and school-based learning; and benefitting from international firms' experiences with apprenticeship systems.





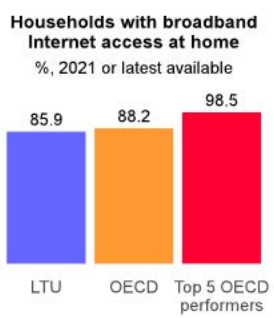


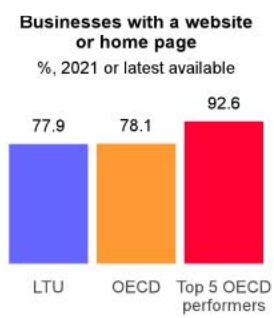


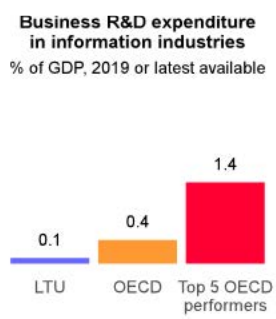
Digital transition

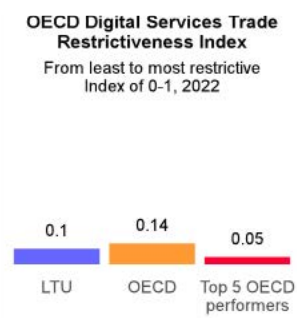
- Digital technologies have advanced, but uptake and use still lag behind, particularly among smaller and younger firms. Investments in digital infrastructure have not sufficed to overcome the urban-rural digital divide. Moreover, the scope for digitalising the public sector remains large.

- Implement the National Broadband Plan to ensure universal access to high-speed broadband by 2027.
- Support the development of venture capital by prioritizing public support through privately-owned funds rather than direct engagement.



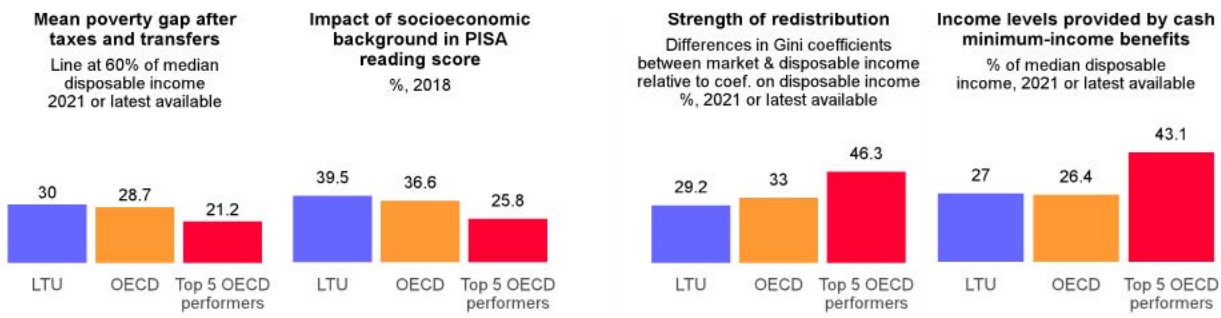






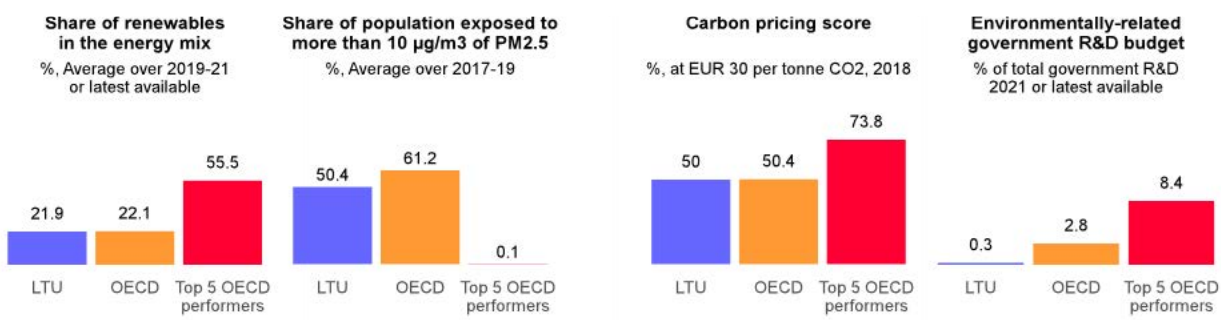
Inclusiveness, social protection, and ageing

- Poverty has increased until recently, when the pandemic led the government to raise social spending, notably on pensioners and targeted social benefits, and lift the non-taxable income threshold for low-income earners. Nonetheless, the share of the population at-risk-of poverty remains the second highest in Europe.
- Further link social support to needs, especially for the elderly.
- Address the underlying reasons for persistent poverty, such as high unemployment or low skills, through greater activation and better education.

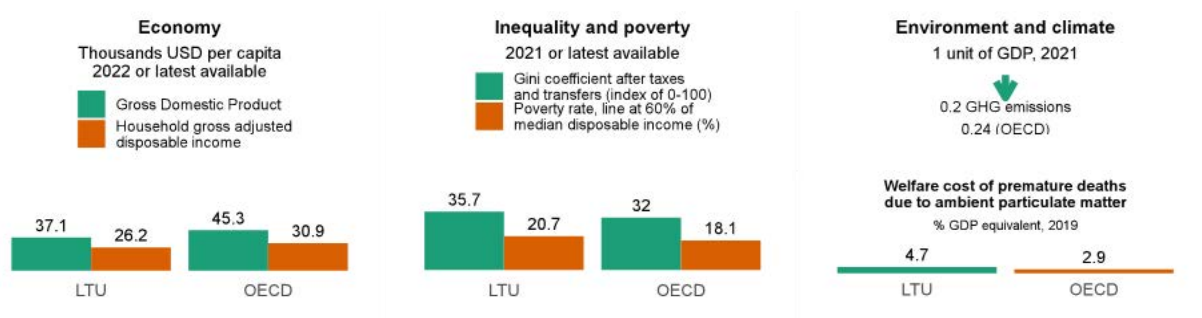


Climate transition

- The emissions reduction objectives of 30% by 2030 is ambitious, particularly as per-capita carbon emissions are rising amidst persistent fuel subsidies.
- Extend carbon pricing to all areas, including large emission sectors such as transport and agriculture.
- Increase public investment in targeted research and development and green infrastructure.
- Compensate vulnerable households for potential cost increases.



Overall performance



LUXEMBOURG

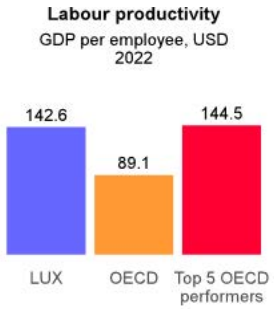
Performance gaps

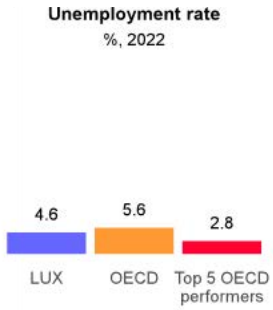
Recommendations

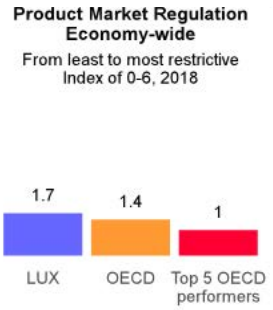
Product and labour markets functioning

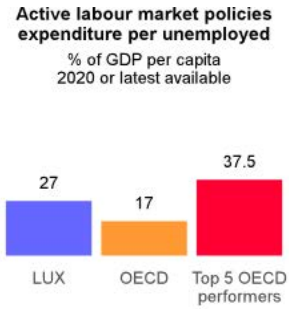
- The unemployment rate is relatively high for young people, while the participation rate of old people is one of the lowest in the OECD.
- Product markets are highly regulated, with the regulatory environment for businesses remaining overly restrictive.
- The indexation of wages to inflation risks eroding the competitiveness of firms.

- Subsidise active on-the-job training schemes targeted toward over-45-year-old workers.
- Reduce administrative burdens on small firms, notably by streamlining procedures for starting a business.
- Reform the wage indexation system in consultation with social partners to take better account of its productivity, employment, and investment effects.





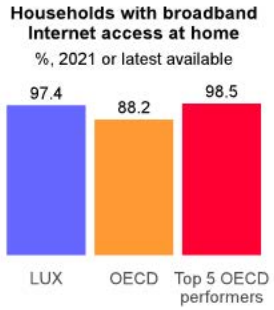


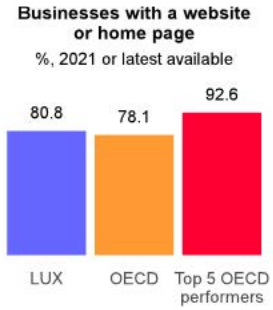


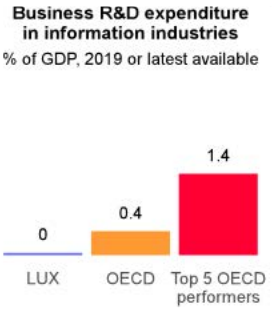
Digital transition

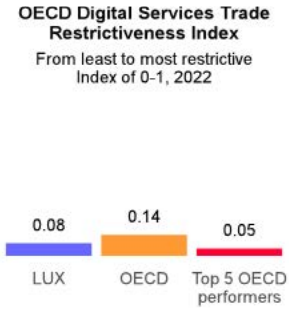
- Despite Luxembourg having a strong ICT infrastructure and a relatively well-educated workforce, businesses report persistent shortages of qualified ICT professionals as a brake on digitalisation. SMEs lag behind in digital adoption, and total private ICT investment as a share of GDP is low.
- The development of public digital services has not taken off.

- Establish an actionable roadmap for the development of digital infrastructure and services, with clear milestones to be re-evaluated at regular intervals.
- Establish dedicated adult training programmes and introduce key programming skills early on in school curricula to address skill mismatches.
- Expand business advisory services and support financing schemes to foster digital diffusion among SMEs, including through direct funding of ICT equipment.
- Consider developing a single personal digital key to reduce the administrative burden for citizens when interacting with the public administration.





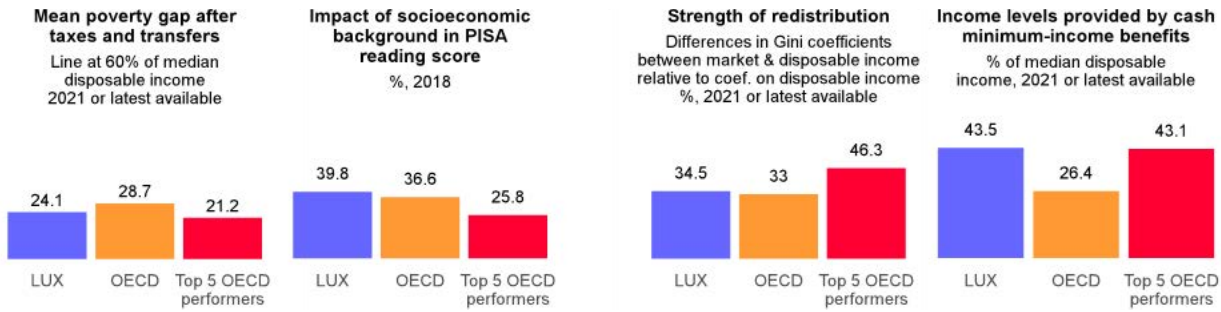




Inclusiveness, social protection, and ageing

- Schooling quality is uneven and educational pathways are rigid. This increases the impact of the socioeconomic background on education outcomes and results in high dropout rates among the most vulnerable.
- With a low effective retirement age, not linked to life expectancy, pension costs risk becoming an increased fiscal liability.

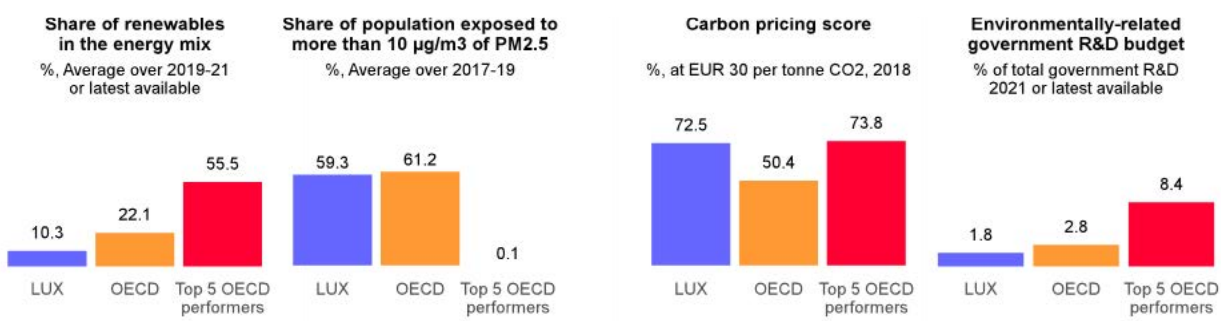
- Develop an early warning system to identify students at risk of early drop-out and take preventive measures.
- Link the statutory retirement age to life expectancy and phase out incentives for early retirement while providing more flexible working arrangements for older workers.
- Promote accessibility of alternative education to help early school leavers re-enter education.
- Reform the first part of secondary education to offer a more general and broad-based education and postpone selection into different educational pathways.



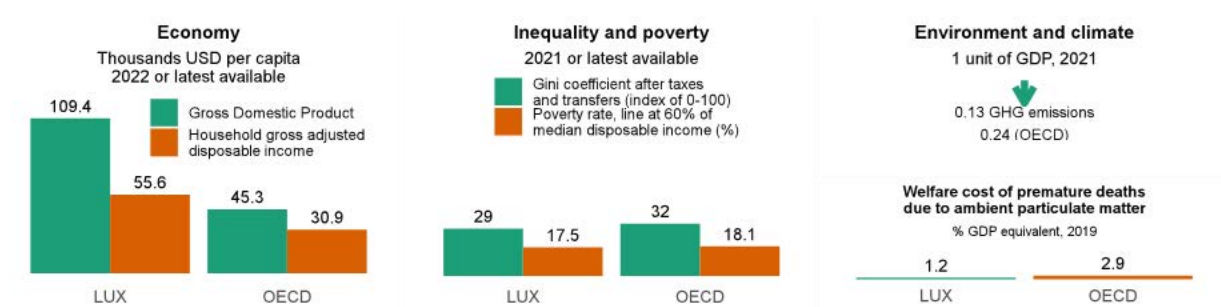
Climate transition

- The share of renewables in the energy mix is low, as is the share of environmentally-related government R&D spending.
- Car ownership is high, while the price of petrol and the usage of public transport is low.
- Environmental standards in agriculture are low.

- Increase public spending on environmentally-related R&D to match private R&D funding and encourage greater investment by firms.
- Introduce and gradually increase road use charges, taper tax incentives for company car fleets and review parking policies.
- Increase benefits for households undertaking energy-efficient renovations.
- Set a rising carbon tax trajectory over the medium- and long-term, while redistributing revenues to minimise the costs for the most vulnerable.
- Strengthen regulations on fertiliser and pesticide use.



Overall performance



MEXICO

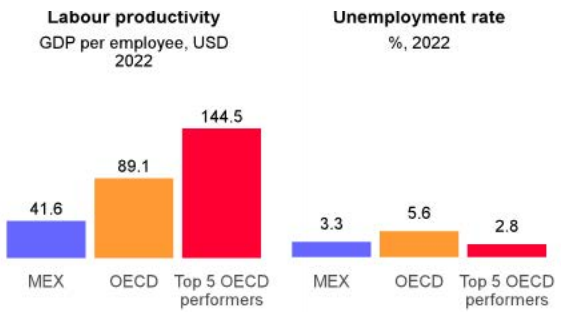
Performance gaps

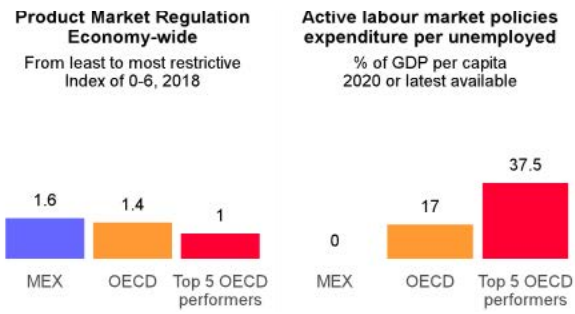
Recommendations

Product and labour markets functioning

- Competition is weak in key sectors of the economy and a small number of companies tend to dominate markets.
- SMEs access to credit is hampered by high interest rate margins and information asymmetries. Digitalisation and Fintech hold the potential to widen access to finance, but market barriers limit their development.
- About 55% of workers are informal, which is a cause and consequence of low productivity.

- Strengthen competition, including by ensuring that the competition authority remains independent and adequately resourced, and by reducing regulatory burdens.
- Upgrade digital payment regulation to facilitate entry in the payment card market.
- Establish a comprehensive strategy to reduce the cost of formalisation, including reducing firms' registration costs at the state and municipal level.

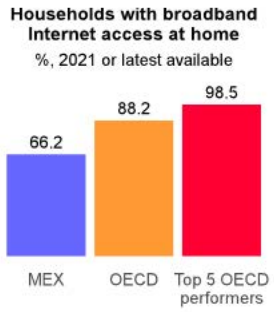


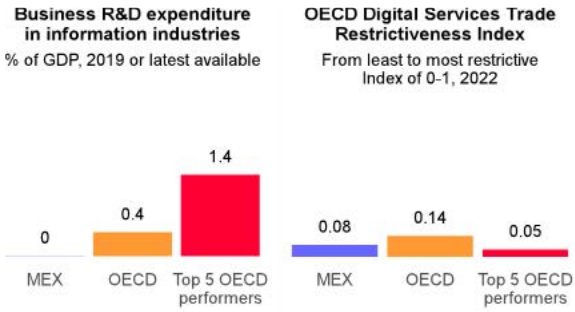


Digital transition

- Mexico has made efforts to enhance digital access, increasing internet access and connectivity through mobile broadband. However, the number of fixed broadband connections remains low and they are more expensive than in peer countries.
- The large education gap in internet usage among younger adults may entail a persistent digital divide.
- The business sector lags behind in exploiting the potential of digitalisation. Notably, too few firms accept digital payments.

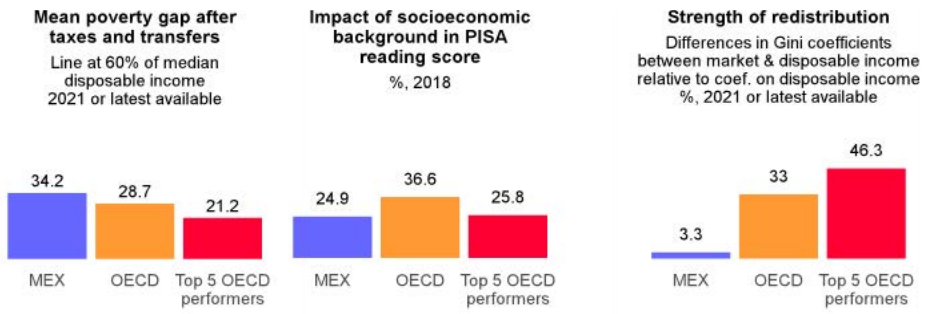
- Increase competition in the fixed broadband market by facilitating the entry of new providers.
- Modify school curricula to strengthen digital literacy from a young age and upskill teachers' digital capacity.
- Support SMEs with technical assistance or grants to increase their online presence.
- Create incentives for the use of digital payments via cash rebates, government sponsored lotteries or consumer rewards.





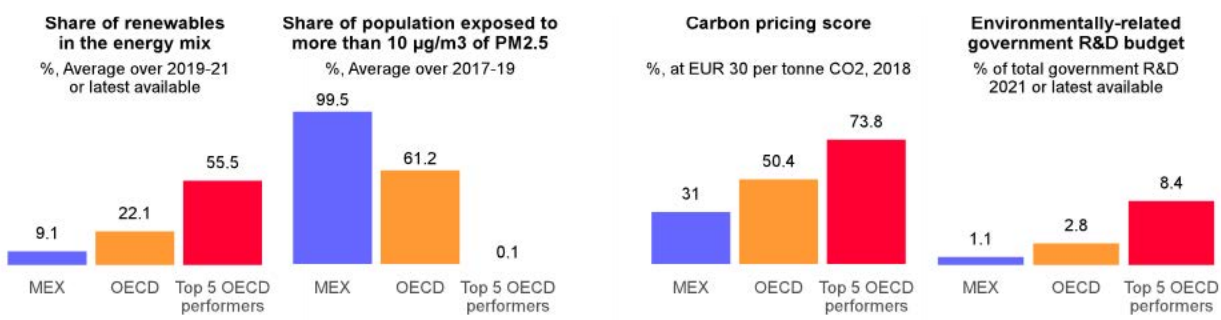
Inclusiveness, social protection, and ageing

- Mexico has one of the highest levels of poverty and income inequality in the OECD, calling for continuing efforts to strengthen social protection, notably by making it more efficient and responsive to economic cycles, to reduce gender gaps and to improve education.
- The education system has been heavily impacted by the pandemic and pre-existing inequalities have likely widened further.
- Despite recent progress female labour force participation is still lagging as care responsibilities fall disproportionately on women.
- Establish a federal unemployment insurance scheme.
- Establish a network of childcare facilities, giving priority to low-income households.
- Put in place programmes aimed at the school reintegration of those who dropped out during the pandemic and provide targeted support and tutoring to those with learning difficulties.

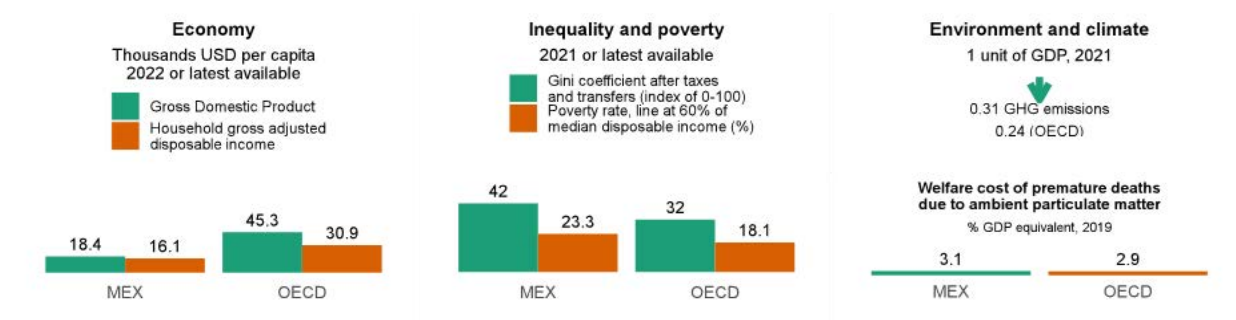


Climate transition

- Mexico was a pioneer among emerging economies in acting on climate change mitigation and adaptation. However, additional policy action is needed to meet emission targets.
- The country's potential in the renewables sector is high but remains untapped and the share of renewables in the energy mix is lower than in most other OECD countries.
- Modernising the electricity grid would enable greening the electricity mix by increasing the share of renewables.
- Broaden the carbon tax base, gradually increase the rate, and use part of the revenues to offset the effects of higher energy prices on low-income households.
- Maintain regulations that promote renewables generation and private sector participation.
- Upgrade the electricity grid by implementing smart grid technologies and integrating storage devices into the network.



Overall performance



THE NETHERLANDS

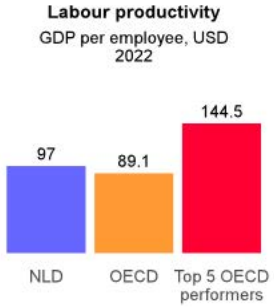
Performance gaps

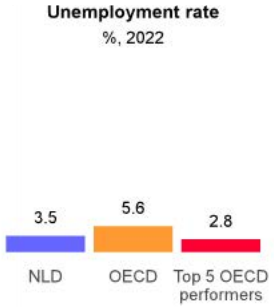
Recommendations

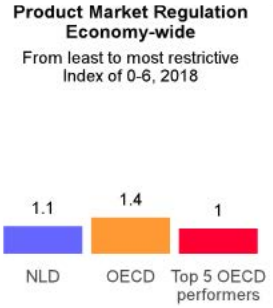
Product and labour markets functioning

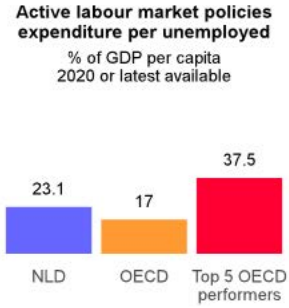
- Employment protection for regular employees is strict, whereas self-employed workers pay less income tax and social security contributions, incentivising businesses to rely disproportionately on own-account workers while leaving them less protected. The Commission for the Regulation of Work has proposed a comprehensive reform package to reduce labour market duality.

- Implement the recommendations from the Commission for the Regulation of Work.
- Allow employers to adapt jobs, workplace and working hours of regular employees in line with the needs of the economy.
- Continue to align tax rates and social security contributions between contract types for workers doing similar jobs.





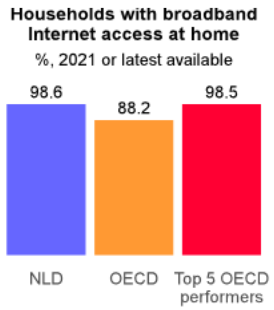


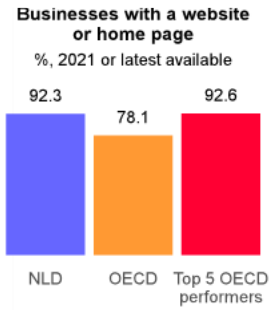


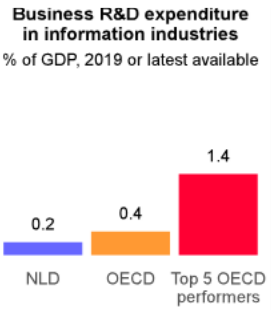
Digital transition

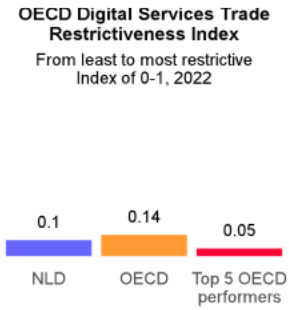
- Small and medium-sized enterprises (SMEs) account for a relatively large share of value added but lag behind in digital adoption. A lack of awareness and the fixed cost nature of investment in digital technologies holds back digitalisation, and passivity towards IT security issues exposes a large share of businesses to cyber risks.

- Increase direct support to SMEs to facilitate the adoption of digital tools, including business advisory services and testing facilities.
- Encourage enterprises to implement existing digital security standards, by continuing to raise awareness about cyber risks and stepping up the Digital Trust Centre.



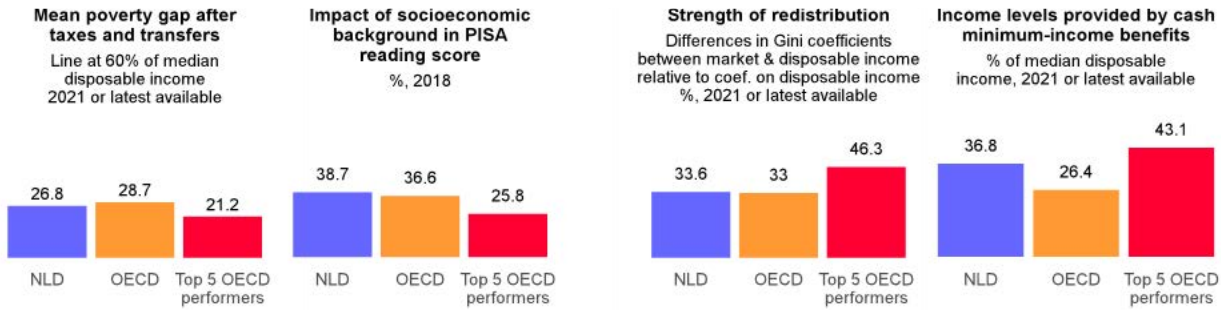






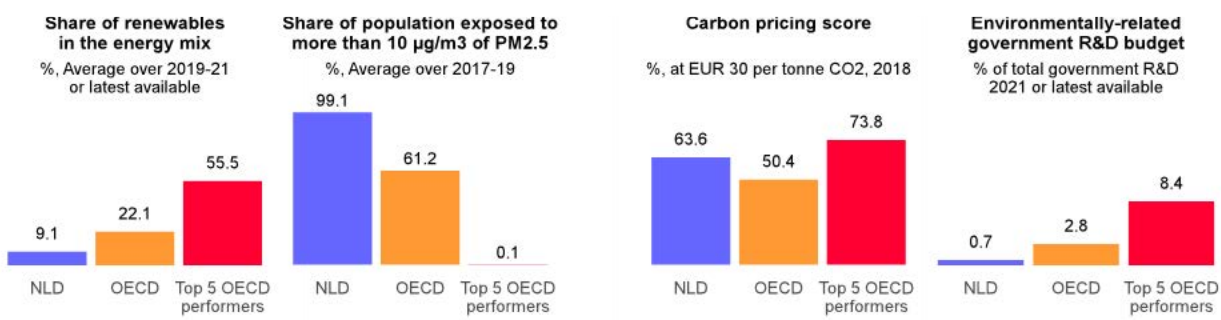
Inclusiveness, social protection, and ageing

- Women's labour participation is high, but nearly 60% of them work part-time, with detrimental impact on earnings and pension entitlements. The gap increases when women become mothers, as children spend relatively little time in childcare despite high enrolment. The reform to make childcare free for all working parents is expected to strongly increase childcare demand and worsen staff shortages, raising doubts about feasibility.
- Provide longer, non-transferable parental leave to both mothers and fathers or introduce bonus periods, where parents qualify for longer paid leave if both use a given amount of shareable leave..
- Phase in the childcare reform gradually, monitor access and evaluate the repeal of the link between hours worked and the amount of the childcare support.

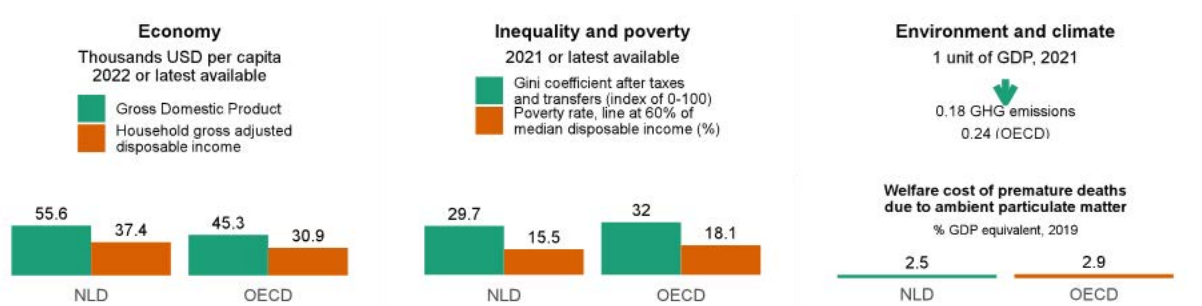


Climate transition

- Despite significant progress, the 2030 voluntary emissions reduction targets will not be reached under current policies, in part because heterogeneous carbon pricing across sources and fuels increases abatement costs.
- Excessive levels of nitrogen deposits close to sensitive natural areas limit new infrastructure and housing developments, prompting the introduction of multiple instruments to reduce deposits and large spending to restructure the agricultural sector.
- Make emission pricing more consistent across sectors and fuels not covered by the EU emissions trading scheme.
- Consolidate instruments to manage and transfer nitrogen emission rights, and further facilitate their standardisation.



Overall performance



NEW ZEALAND

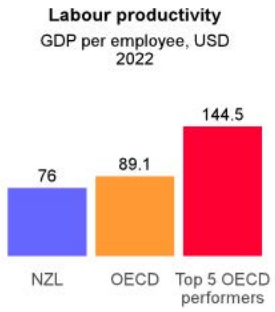
Performance gaps

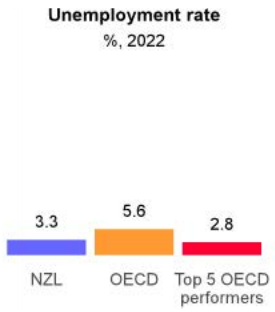
Recommendations

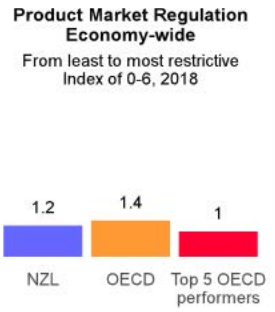
Product and labour markets functioning

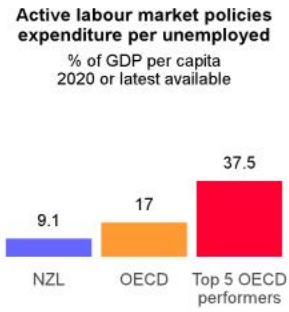
- Productivity is low by international comparison, in part due to muted product market competition arising from geographical isolation, and skills and qualifications mismatches.
- Effective corporate tax rates are high, holding back capital investment and FDI.
- Regulatory barriers to competition are low in general, but the retail grocery sector is dominated by a duopoly of two large supermarket chains.

- Monitor the effect of the 2021 reforms in the FDI screening regime and streamline the procedure further if needed.
- Assess the appropriateness of the current corporate tax rate.
- Implement the 2023 reforms to reduce barriers to competition in the retail grocery sector and amend them if competition does not noticeably rise.





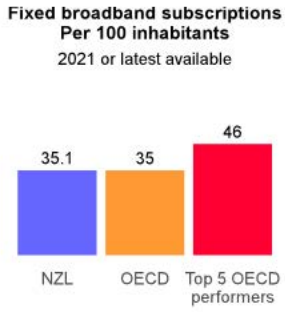


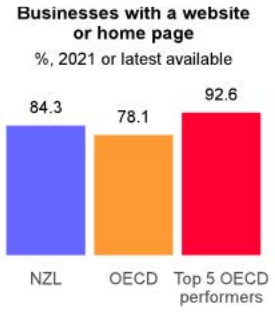


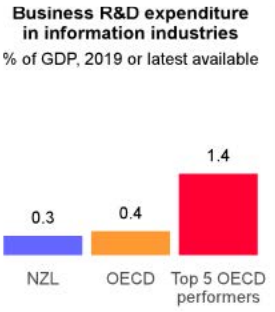
Digital transition

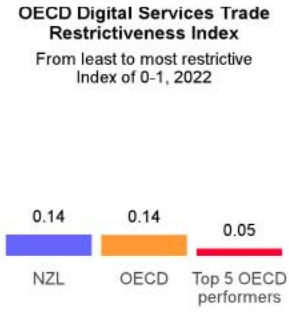
- Despite a solid digital infrastructure, the digital sector is small by international comparison. Digital innovation and uptake of digital technologies by firms are also relatively low. Moreover, low rates of secondary school achievement and tertiary attainment have resulted in a weak domestic pipeline of ICT skills, with chronic labour shortages in the ICT sector.

- Improve mathematics and science teaching in primary schools, including by putting more emphasis on inquiry plus guided teaching using well-articulated knowledge bases for both the student and the teacher.
- Advance the national digitalisation strategy by providing a strong mandate for strategic coordination across all relevant policy areas and by collecting the data needed to support it.



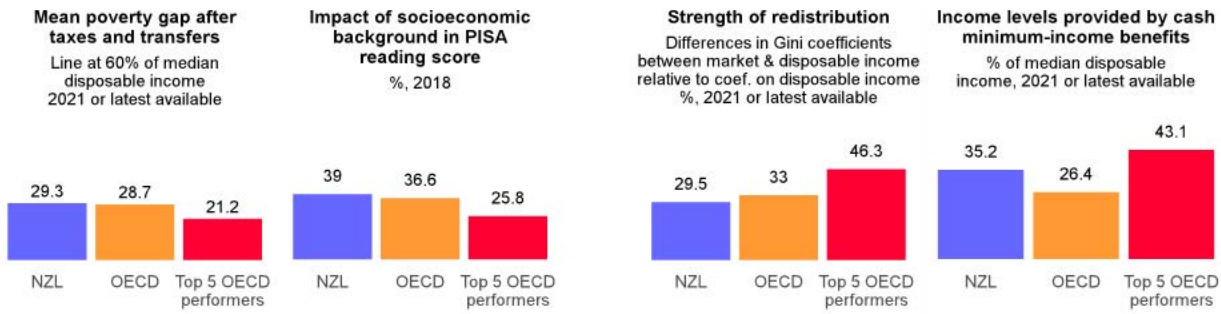






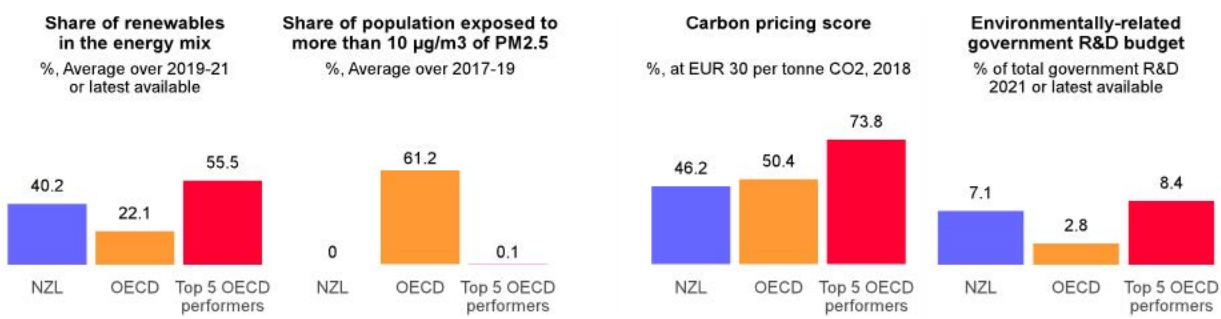
Inclusiveness, social protection, and ageing

- Income inequality is around the OECD average, but has widened over time. The child poverty rate, which is one of the government's main wellbeing objectives, is also higher than the OECD average, especially among Māori and Pasifika. Outcomes in health and education continue to be worse for Māori and Pasifika.
- Continue to prioritise improving wellbeing for Māori, Pasifika, sole parents and children, through targeted income, education, health and housing policies.
- Develop programmes to help Māori and women pursue digital careers.

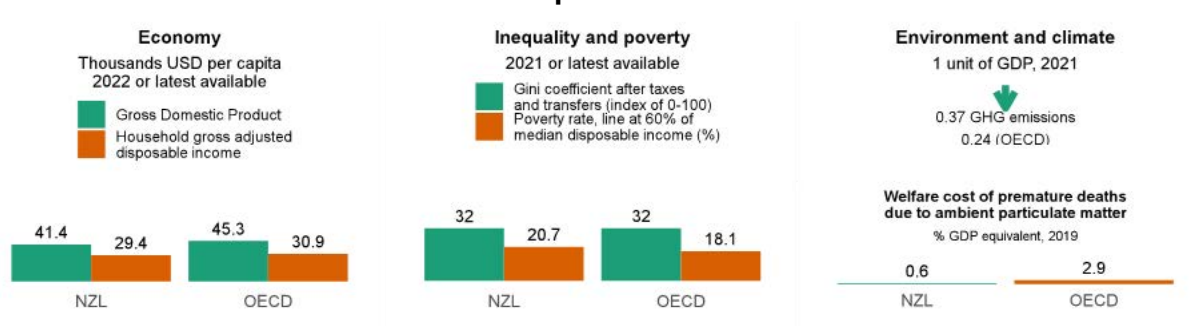


Climate transition

- New Zealand has amongst the highest greenhouse gas emissions (GHG) emissions (excluding land use, land-use change and forestry) per capita among OECD countries and is not on track to meet its emissions reduction targets. Emissions from agriculture - mainly methane- and road transport will need to fall substantially if New Zealand is to transition to a low-emissions economy.
- Complement the progressive tightening of the supply of emissions permits with targeted measures (such as support for electric vehicle infrastructure) that address market failures not corrected by carbon pricing alone.
- Subject biological GHG emissions to a carbon price either at the farm level, as recently proposed by the government following consultations, or through inclusion in the New Zealand emission trading scheme.



Overall performance



NORWAY

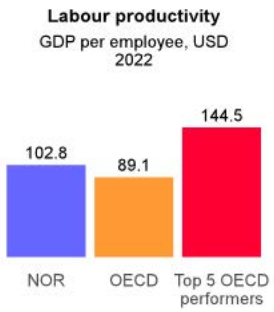
Performance gaps

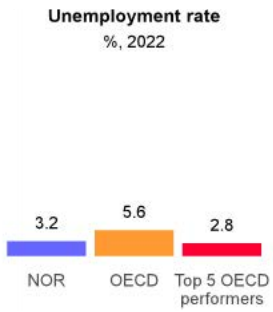
Recommendations

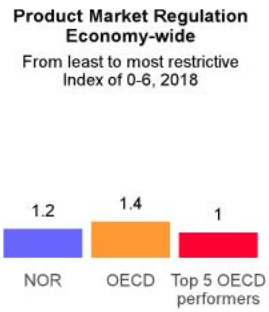
Product and labour markets functioning

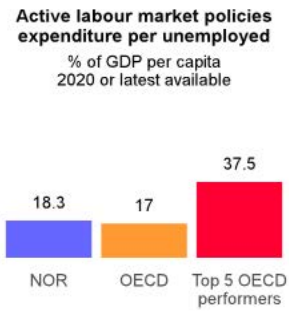
- The insolvency regime tends to limit entrepreneurs' ability to start new businesses following a failure, hampering effective resource reallocation. Time to discharge (i.e., the number of years before businesses are discharged from pre-bankruptcy indebtedness) is particularly long.
- Despite a very low unemployment rate, almost 20% of the working-age population is outside the workforce, with some groups permanently detached from the labour market.

- Boost business productivity through improvements in insolvency procedures, including lighter penalties for failed entrepreneurs.
- Increase further spending on active labour market programmes upon a close monitoring of their outcomes and a focus on the population with a weak attachment to the labour force and training programmes that provide skills for the digital era.





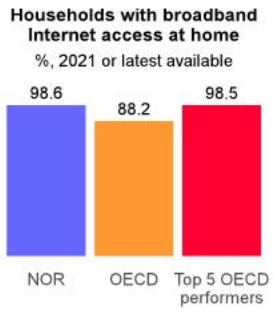


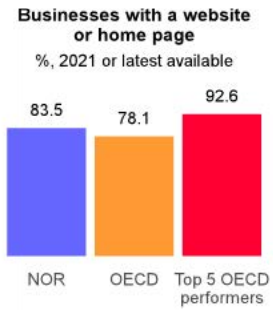


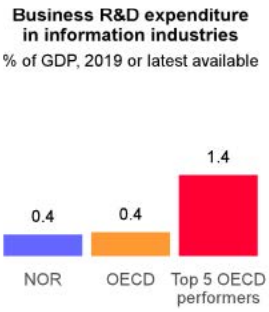
Digital transition

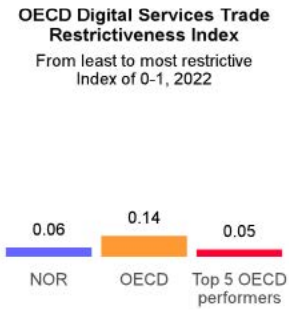
- Digital connectivity is high, and most firms use ICT tools. Norway also fares well in terms of provision and uptake of digital government services. However, the lack of digital literacy for some groups hampers digital inclusion.
- There is also scope for the education system to provide more skills for the digital era. Relatively few students graduate in ICT or pursue degrees in other sciences, technology, engineering, and mathematics (STEM) fields.
- Business R&D is comparatively low, despite government support.

- Introduce under the on-going digitalisation reform of the public sector programs aimed at improving digital literacy for some specific segments of the population, such as students and foreign women.
- Provide additional funding to tertiary institutions for degree completions in disciplines that are important for the digital transformation.
- Rebalance R&D support for SMEs towards direct support.



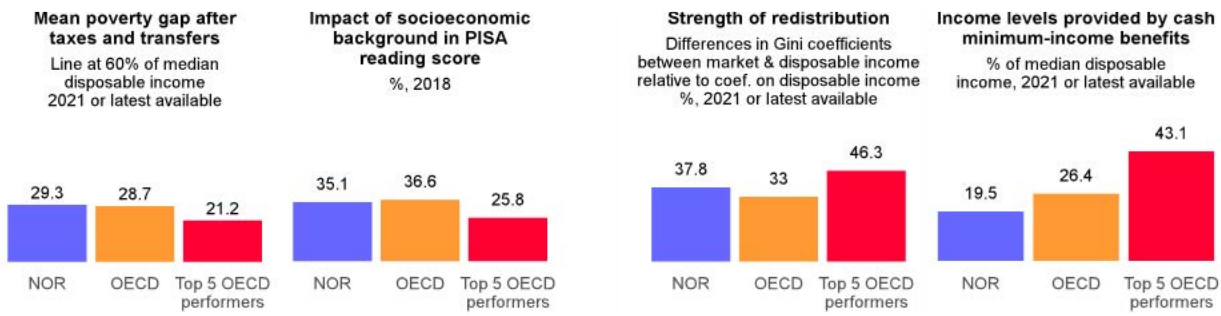






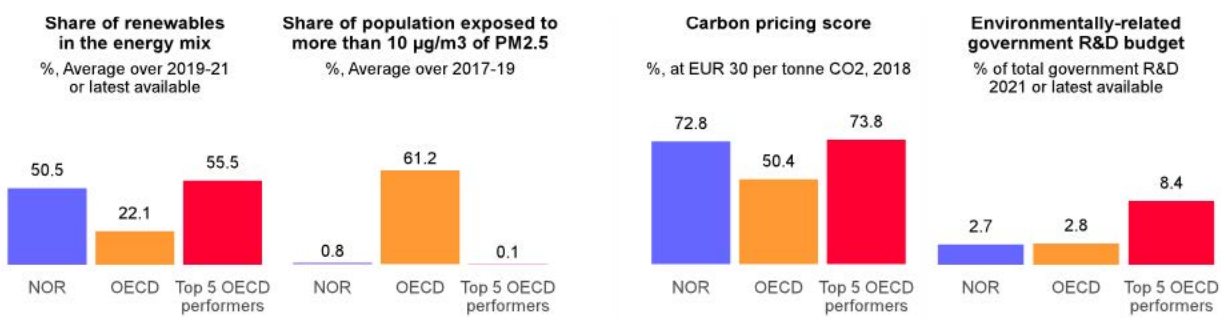
Inclusiveness, social protection, and ageing

- Income inequality is low, thanks to high employment among women and comparatively narrow gender wage gaps. However, labour force participation has been trending downward, due to early retirement.
- Housing affordability remains an important issue for low-income households, especially in high-cost cities.
- Limit pathways to early retirement, including by lowering sick-leave compensation and strengthening the treatment and rehabilitation requirements for receipt of disability benefits.
- Raise investment in social rental housing and lift the income thresholds for eligibility to means-tested housing allowances for disadvantaged renters.

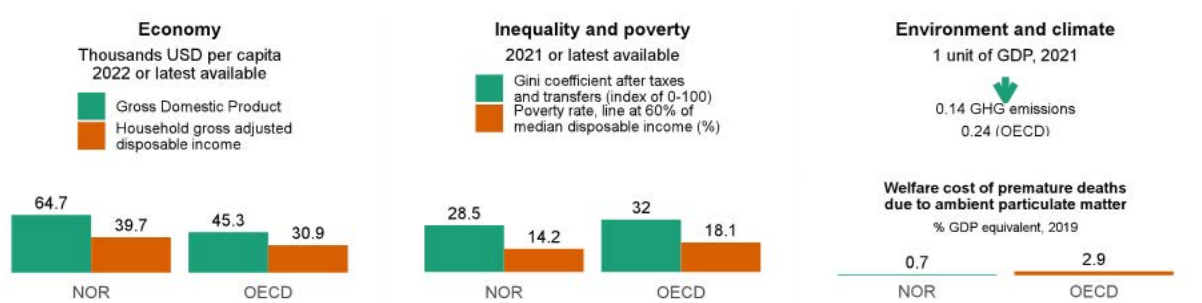


Climate transition

- Norway's CO2 emissions are low, largely because of reliance on hydropower, but will need to be lowered further to achieve climate targets and move to a low-emission society by 2050. Carbon prices are due to increase and large-scale public-supported projects have been launched for carbon-capture and storage. However, gaps in the coverage of carbon taxation remain. Around 15% of total emissions, notably of methane and nitrous oxide from agriculture, are not priced or covered by the European Trading System.
- Ensure implementation of the scheduled carbon-price increases under the new Climate Action Plan, while addressing gaps in the coverage of carbon taxation.
- Continue providing support for technological solutions to facilitate the green transition, including carbon capture and storage projects.



Overall performance



PERU

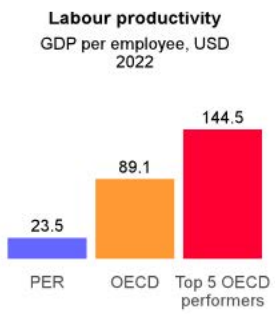
Performance gaps

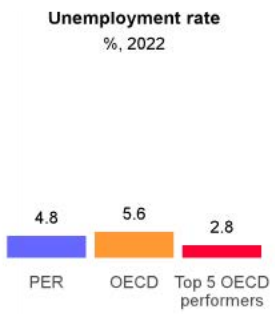
Recommendations

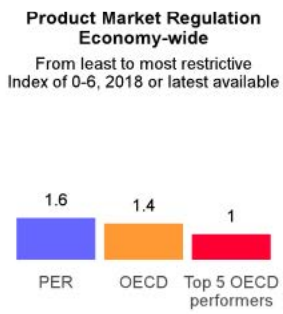
Product and labour markets functioning

- The economy is heavily reliant on natural resource intensive sectors and has limited diversification of exports, in terms of goods, firms and destinations.
- Competition is weak in key sectors and a small number of companies tend to dominate markets.
- Many public agencies across different levels of government have weak implementation and enforcement capacities, including in public investment and budget management. Peru's civil service fragmentation, high job instability and lack of professionalization have hindered government effectiveness. Implementation of a 2013 civil service reform has been weak.

- Subject existing and new regulations to systematic impact assessment with regards to competition.
- Enhance R&D and innovation support to facilitate higher value-added export products, diversification, and the energy transition.
- Fully implement the civil service reform across all levels of government, and ensure better skills capacity of the civil service, and systematic adherence to basic merit-based processes and standards in key areas such as recruitment, promotion and compensation.



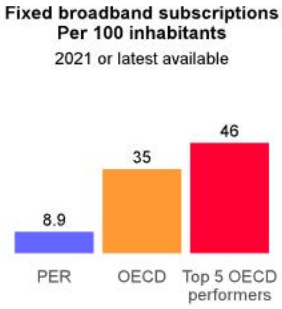


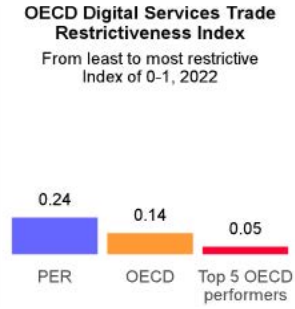


Digital transition

- Poor and uneven internet coverage, coupled with high costs, hinder digital transformation. While the country's internet penetration rate reached almost 90% in 2021, in practice only 70% of rural Peruvian households had access to the internet. This is mostly mobile connections as fixed internet has low penetration, even compared to the Latin American region.
- Although the pandemic has sped up digital transformation in firms, SMEs report low use of online tools to buy and sell.

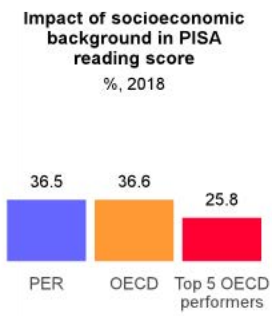
- Boost public investment and work with local governments to mobilise investments to expand fixed internet coverage, particularly in rural and remote areas.
- Boost public support to SMEs, in cooperation with the private sector, through targeted programmes to facilitate the adoption of digital tools, particularly in rural areas.
- Foster digital skills through education and enhance the digital skills of teachers and school directors.





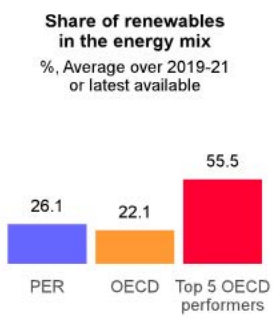
Inclusiveness, social protection, and ageing

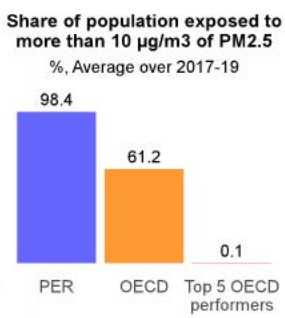
- The COVID-19 pandemic has reversed progress in reducing poverty and inequality and has highlighted long-standing gaps in the social protection system. Major structural problems, including a high share of informal workers with no social insurance and a low coverage of social assistance programmes, have worsened.
- Expand coverage of cash transfer schemes for poor households while maintaining rules conditioning them on participation in education and health services.
- Establish a comprehensive strategy to foster formalisation, including lower non-wage costs, better skills, stronger enforcement and improvements in tax administration.

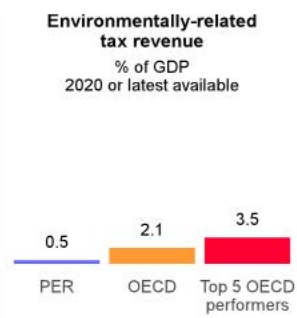


Climate transition

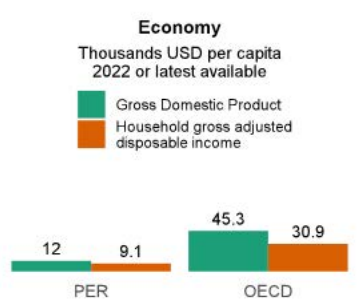
- Peru is particularly exposed to environmental risks and water security issues. Combined with deforestation, illegal mining, air and water pollution, and agricultural expansion, the climate risks threaten recent advancements in Peru's development. While the updated Nationally Determined Contributions are ambitious, they still fall short of the net-zero target.
- Accelerate progress in decarbonising the economy through more stringent regulations and more consistent price signals, notably by gradually introducing carbon taxes, while protecting the purchasing power of vulnerable households.
- Effectively implement economic instruments for water risk management and strengthen the regulatory framework towards universal coverage of water supply and sanitation.

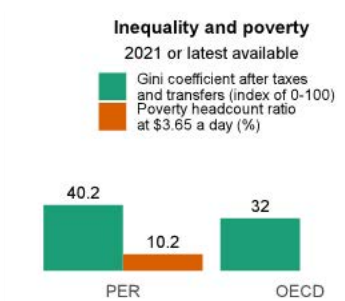


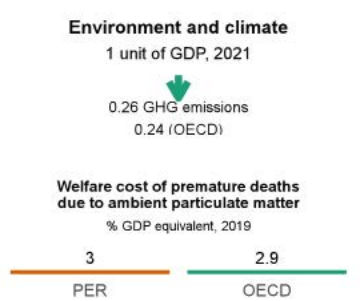




Overall performance







POLAND

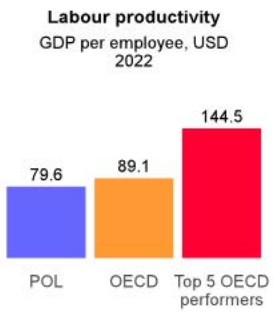
Performance gaps

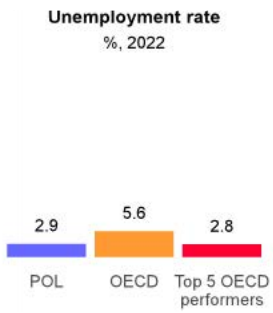
Recommendations

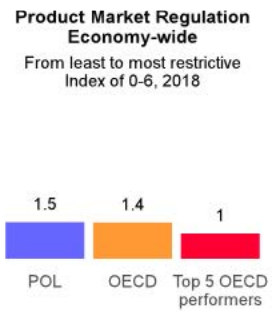
Product and labour markets functioning

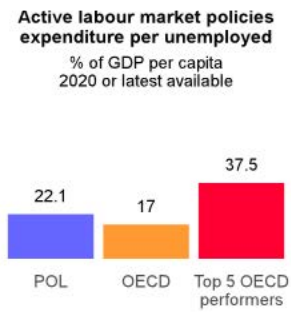
- Regulation of services, which account for around half of the exported value added, has significant room for improvement. This is the case for lawyers, notaries, architects and engineers, and general occupational licensing.
- State ownership remains important.

- Reduce competition barriers in services and networks.
- Ensure good governance of SOEs and enforcement of competition policy, in particular in sectors with state presence.





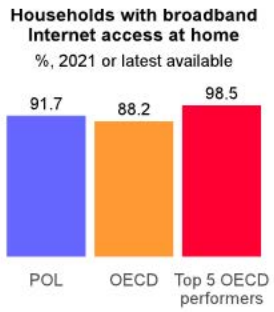


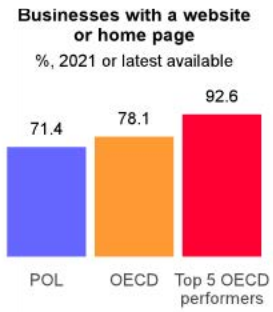


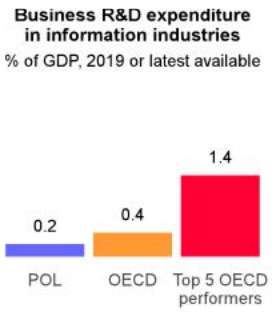
Digital transition

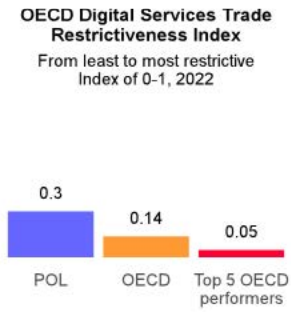
- Despite significant progress in digitalisation in recent years, Poland lags other OECD and peer countries.
- Digital skills are below the European average, and particularly low among the older population.
- The level of firms' adoption of Information and Communication Technology (ICT) is behind most advanced economies.

- Increase the flexibility of formal and non-formal education through more modular training, making use of recognition of prior learning and microcredentials. Adopt individual training accounts, making training rights portable from job to job.
- Promote lifelong learning, particularly among those working in SMEs and the less educated, inactive, and older population.
- Provide ICT equipment in schools and training for vocational education and train teachers to teach digital skills.
- Expand consultancy services that offer expert technical advice to facilitate investment in digital technologies among SMEs.



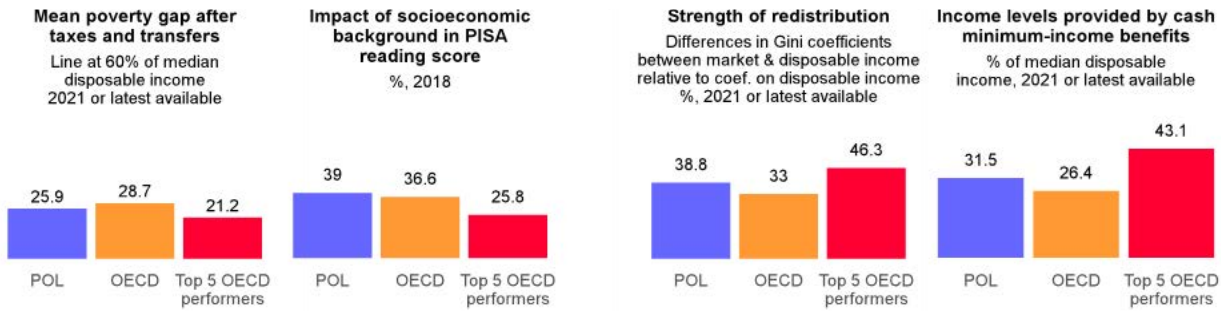






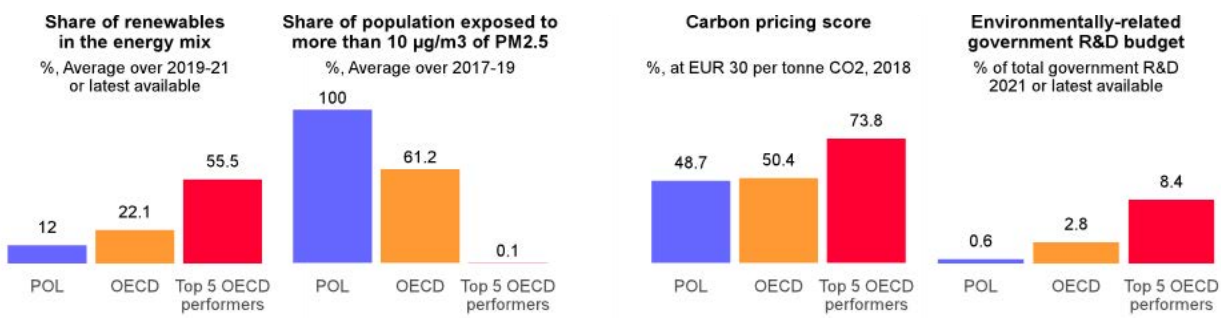
Inclusiveness, social protection, and ageing

- Healthcare is receiving additional public funding since Poland is lagging in terms of healthcare outcomes.
- Future low pension adequacy increases the risk of old-age poverty and long-term spending pressures.
- Stronger employment protection of older workers creates disincentives to hiring them.
- Make the healthcare strategy better integrated throughout the healthcare system. Expand care coordination and elements of pay-for-performance to all health and social care areas.
- Improve working conditions in the health sector to attract and retain workers. Over time, raise health workers' remuneration.
- Extend working lives and gradually align the male and female statutory retirement age increasing it in line with life expectancy gains in good health.
- Harmonise employment protection across age groups.

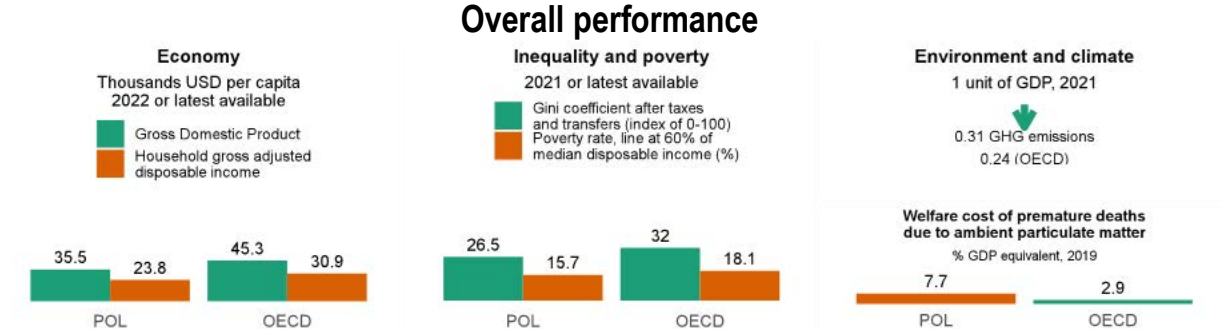


Climate transition

- Despite progress in making economic growth more sustainable, the carbon intensity of the economy remains high, with strong reliance on coal. Much of the population is still exposed to harmful levels of pollution.
- The energy transition strategy has been revised given the current geopolitical situation, energy security and energy price volatility.
- Renewables investment is hindered by capacity and connection constraints of the electricity grid and the regulatory framework.
- The pricing of the environmental costs of fossil fuels is uneven across the economy. Just over 30% of energy-related emissions are priced at or above the benchmark level of 60 euros/tonne of CO2.
- Hard coal mines will be closed by 2049.
- Accelerate the development of renewables, diversifying technologies and improving energy security and efficiency. Minimise the increased reliance on coal in the near term.
- Expedite and scale-up investments in the electricity grid. Review regulations and other constraints hindering renewables investment.
- Set out a clear long-term path for carbon pricing. In the medium-term, raise and eventually align the national emissions fee with the EU ETS.
- Ensure a just transition through well-targeted retraining, a hiring freeze and inter-sectoral upskilling for the hard and lignite coal sectors. Apply complementary policies in the wider coal value chain.



Overall performance



PORTUGAL

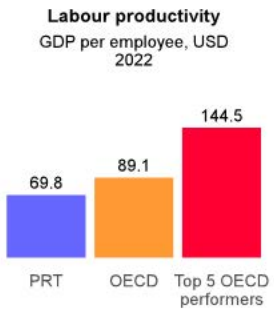
Performance gaps

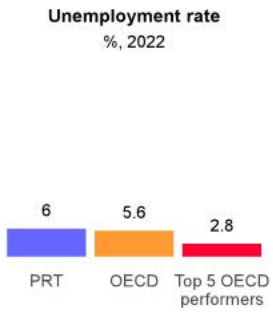
Recommendations

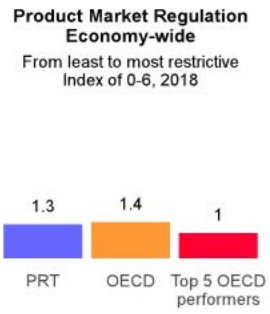
Product and labour markets functioning

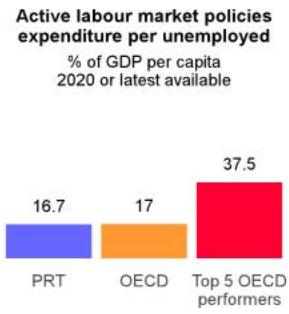
- Participation in training is low. Some ambitious training programmes are in place, but those not included in these programmes benefit from limited incentives and opportunities to seek training. Resources for active labour market policies and public employment services are relatively low.
- Increases in house prices have reduced housing affordability and may affect labour reallocation.
- Despite significant progress, the duration of insolvency procedures remains elevated, lowering the liquidation value of failing firms.

- Expand training programmes and boost incentives to participate, especially for workers in jobs that are more affected by the digital and green transitions.Provide more individualised job-search and training support to jobseekers, especially younger ones.
- Accelerate the digitalisation of public employment services to free up resources and support caseworkers.
- Revise land use regulations and limit discretionary powers of municipalities in licensing procedures to spur business investment in dwellings, boost housing supply and support labour mobility.
- Encourage the use of out-of-court procedures to prevent court congestion and accelerate insolvency procedures.





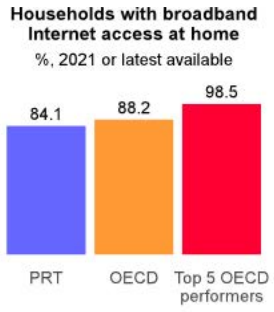


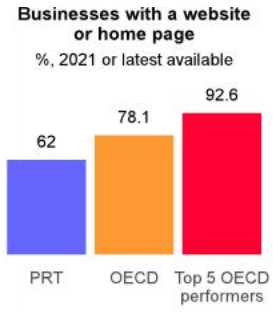


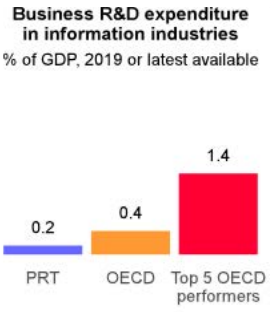
Digital transition

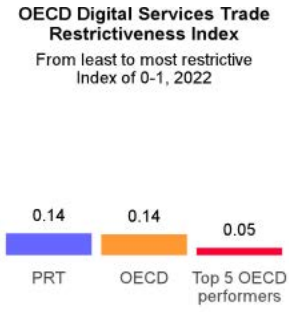
- Small firms lack expertise in digital technologies. Low digital skills, particularly among older and less-educated workers, limit the uptake of digital technologies.
- Schools and teachers are not well equipped to use and teach ICT.
- Broadband prices are high by international standards, reflecting low competitive pressures, holding back the use of digital tools.

- Expand programmes for small firms to acquire digital training, advisory services and information on security and privacy.
- Ensure the completion of the planned expansion of digital resources and ICT training to schools and teachers in the Recovery and Resilience Programme.
- Reduce barriers to consumer mobility across telecommunications providers.



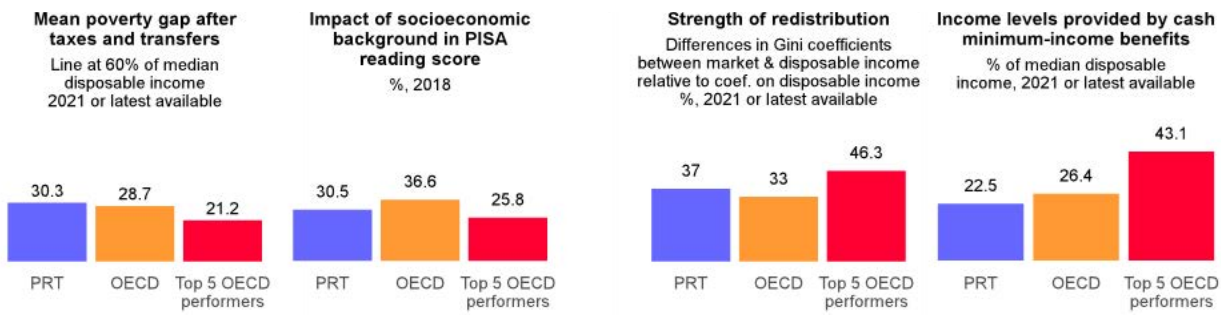






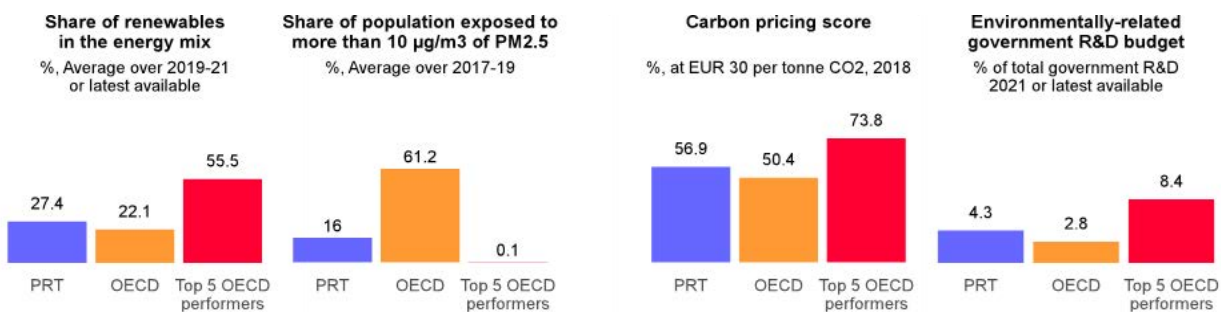
Inclusiveness, social protection, and ageing

- Despite labour market improvements over recent years, in-work poverty remains high.
- The pandemic has highlighted structural weaknesses in the healthcare system, including inefficient budgeting procedures, shortages of nurses and long-term care workers, insufficient resources in primary care and prevention, as well as social and geographic health disparities. The ageing population will increase financial pressures.
- Strengthen labour inspections to prevent abuses in the use of fixed-term and non-standard contracts.
- Extend performance-based remuneration and improve working conditions and training opportunities.
- Strengthen budgeting procedures, accountability and coordination across the health system.

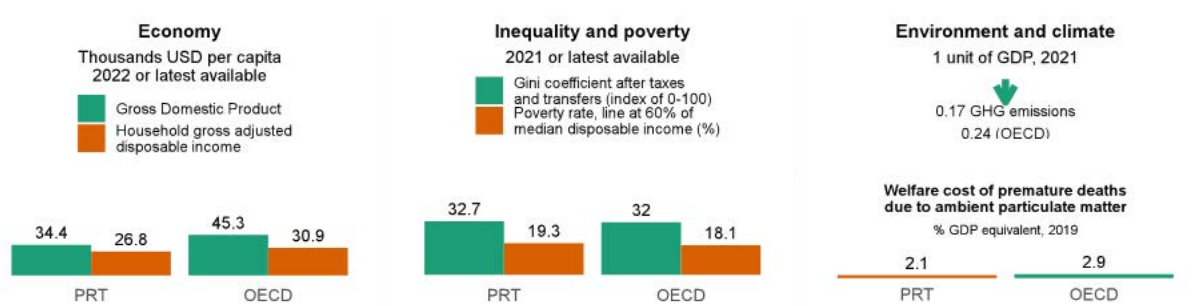


Climate transition

- Portugal is broadly on track to reach its 2030 greenhouse gas emission targets. Renewable electricity production has increased rapidly. However, air quality remains a concern and emissions from the transport sector are high.
- Carbon price signals are unclear, varying by sector and fuel type.
- Accelerate investment in electric mobility and public transportation and adjust vehicle taxes in proportion to emissions.
- Improve price signals on the use of fossil fuels while providing financial support to shift to greener consumption choices, particularly for low-income and vulnerable households or for large up-front costs.



Overall performance



ROMANIA

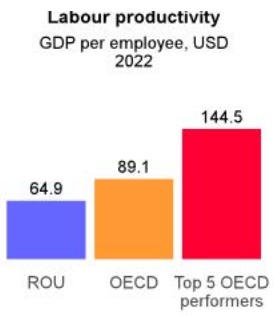
Performance gaps

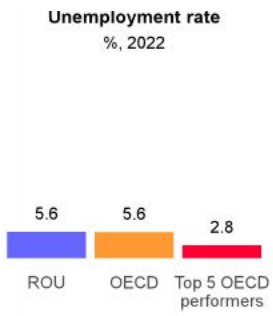
Recommendations

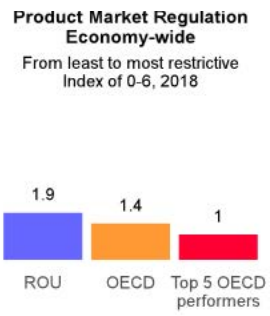
Product and labour markets functioning

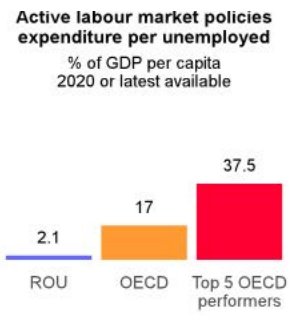
- Trust in institutions is low and corruption remains a major issue.
- Productivity growth in the business sector is held back by burdensome red tape and slow debt restructuring.
- Legislation changes too often and takes inadequate account of its impact on ease of doing business.

- Provide the National Anti-Corruption Directorate with more resources and powers. Provide better guidance to members of Parliament on identifying and managing conflicts of interest.
- Simplify licencing and permit systems, notably by enhancing the use of online services, to make it easier to register new businesses.
- Strengthen the insolvency regime to facilitate debt restructuring, notably by introducing out-of-court mechanisms.
- Reduce further the use of emergency decrees and conduct more impact assessments on proposed legislation.





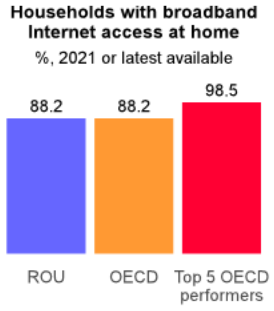


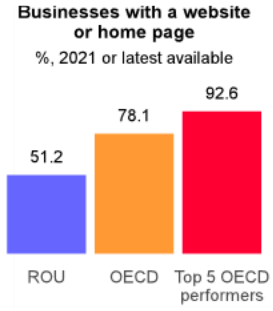


Digital transition

- A relatively large number of Romanians do not have basic digital skills and do not use digital tools.
- Substantial scope for enhancing public-service efficiency through technology remains. Notably, improved systems for tax administration would enhance compliance and help overcome Romania's problem of low tax revenue.

- Devote more resources to ICT equipment in deprived schools and training for teachers.
- Accelerate the computerisation of tax administration as part of efforts to improve tax collection.

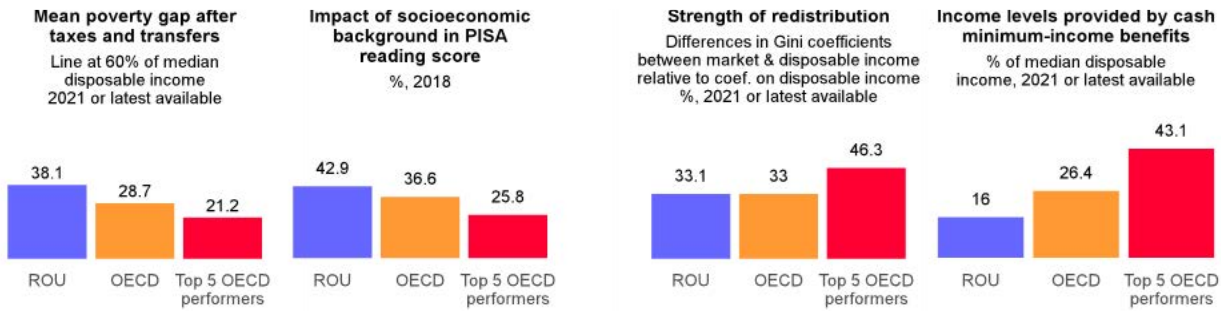




Inclusiveness, social protection, and ageing

- Income inequality is widened by women being heavily occupied with caring roles, unemployment in disadvantaged communities and inadequate education for vulnerable students.
- Unmet medical needs are high among deprived communities, including the Roma.
- The pension system is in deficit and pension payouts are modest, in part reflecting early retirement, especially among women.

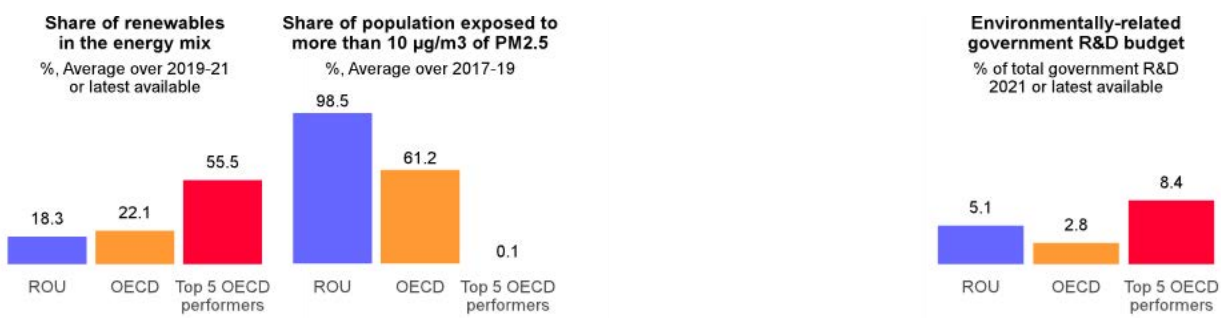
- Provide greater access to affordable and good quality childcare and long-term care services.
- Strengthen active labour market policies for vulnerable jobseekers.
- Increase support for students at risk of dropping out of school.
- Improve access to healthcare, notably through more community nursing and use of telemedicine.
- Harmonise the legal retirement age between women and men and link it to life expectancy.
- As planned, revise the pension benefit formula to strengthen financial sustainability, while preventing old-age poverty.



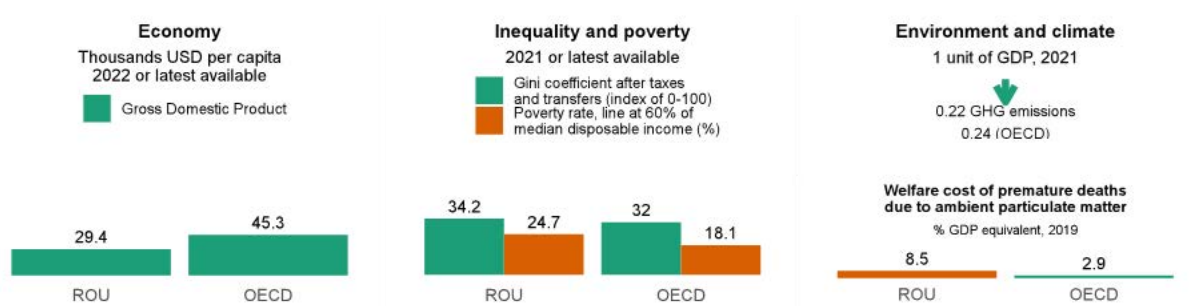
Climate transition

- Romania remains highly dependent on coal for electricity generation. Stronger inducements through tax and support are needed to decarbonise the energy mix and increase the efficiency of energy use.
- Use of solid-fuel fired stoves for heating and cooking contributes to indoor air pollution and premature deaths.

- Increase investments in renewable electricity generation.
- Extend carbon taxation to sectors of the economy not covered by the EU Emission Trading Scheme and harmonise its level.
- Increase vehicle and energy taxation to better reflect environmental impact.
- Expand support for households to stop using polluting stoves and improve home insulation.



Overall performance



SLOVAK REPUBLIC

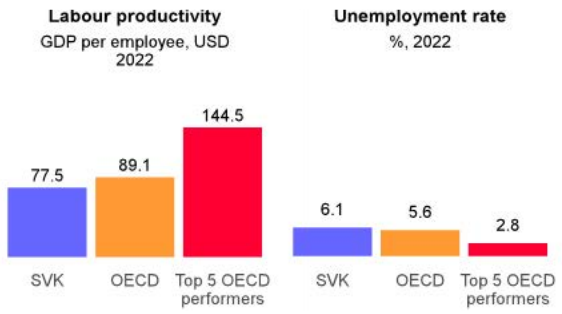
Performance gaps

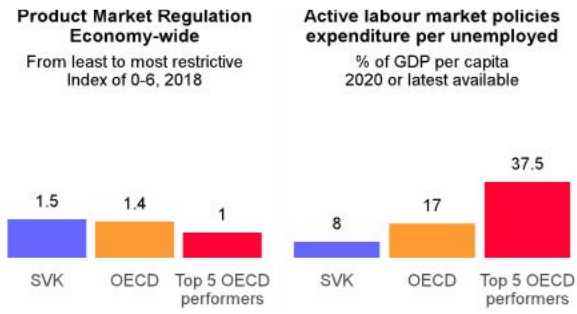
Recommendations

Product and labour markets functioning

- Product market regulation in Slovakia is slightly more restrictive than the average OECD country. The administrative burden for small start-up firms is high, mainly due to licenses and permits. Regulations restrict competition in professional services especially for lawyers, notaries, architects, and civil engineers.
- Perceived corruption is high and trust in institutions and the judiciary system is low.

- Reduce the administrative burden on start-ups by introducing "silence is consent" licensing rules.
- Continue efforts to fight corruption, including by adopting and implementing ongoing reforms to strengthen trust in the judiciary and public sector integrity.

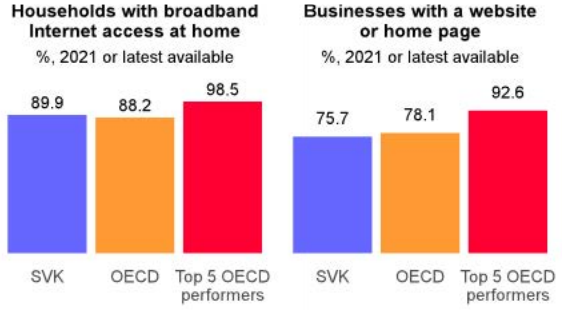


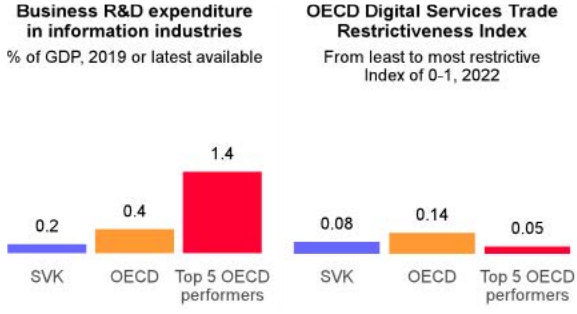


Digital transition

- Slovakia has a vast underexploited potential to unleash the benefits of the digital economy. Firms, especially the smaller ones, lag in the adoption of digital tools and there are significant shortages of digital skills among workers.
- Expenditure in business R&D, especially in the information industry, is low in international comparison.

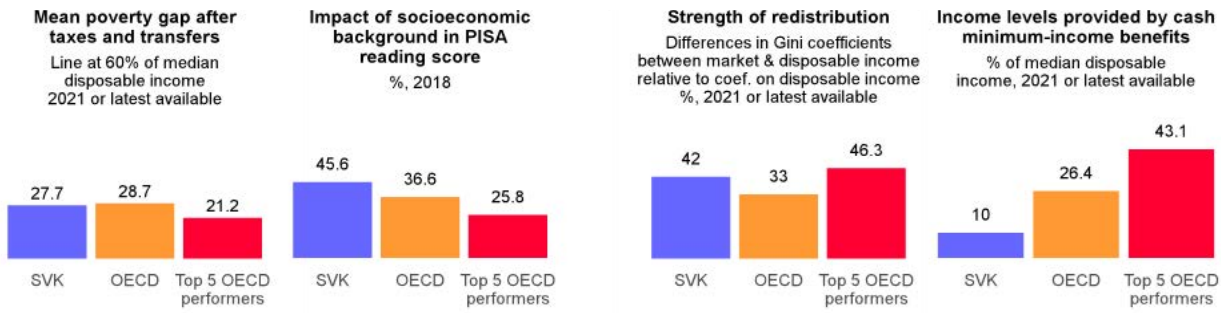
- Boost business R&D funding especially in the information industry by expanding the use of direct R&D support, such as grants, and make the R&D tax allowance refundable for small and young firms
- Reduce digital skill shortages in the economy by improving the responsiveness of tertiary education to labour market needs via supporting the establishment of employer-led training associations.





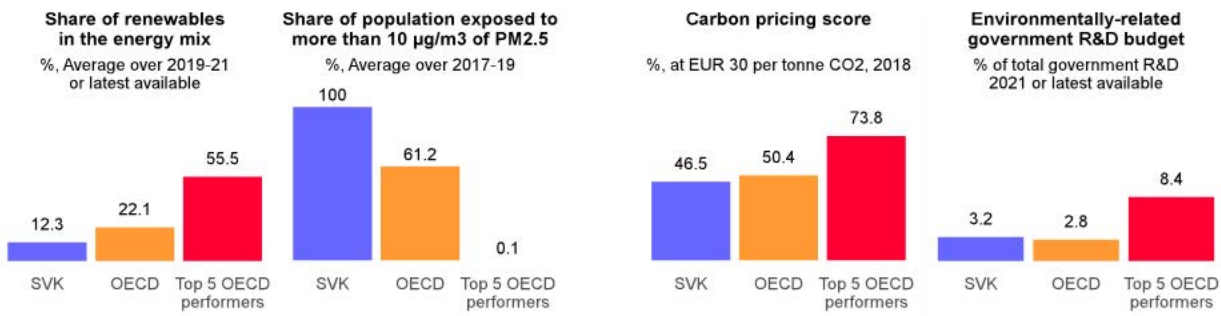
Inclusiveness, social protection, and ageing

- Inequality and poverty are low overall, but socioeconomic and wellbeing gaps remain in several areas. Educational results are weak compared to other OECD countries and highly dependent on socio-economic background.
- The participation rate of women and low-skilled workers is low and the gender wage gap wide.
- Pension expenditure is rising faster than in other EU countries, reflecting a low effective retirement age.
- Expand the supply of high-quality childcare facilities, especially in underserved regions and strengthen teacher training with a focus on methods to identify and address learning weaknesses.
- Reduce the maximum duration of parental leave and make part of it conditional on the father's participation.
- Expand active labour market programmes, in particular re-training measures for the low-skilled.
- Link the minimum number of years of contributions required for early retirement to life expectancy and phase out the early retirement option for mothers.

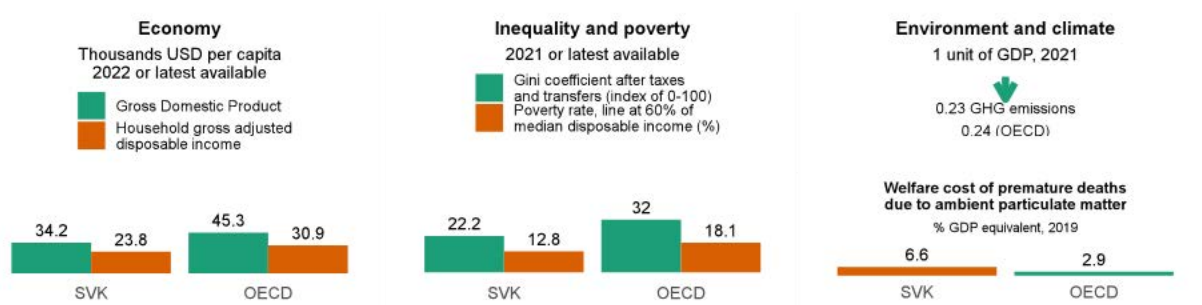


Climate transition

- Slovakia has reduced its carbon and energy intensity over the past decades, but progress has slowed down in recent years. Air pollution is among the highest in OECD countries. The residential sector accounts for a high share of carbon and other emissions, due to the use of inefficient boilers and heaters and burning of poor-quality fuel such as coal, wood or waste.
- The share of carbon emissions priced above EUR 60 per tonne of CO2 is low relative to OECD peers.
- Accelerate the green transition by investing in energy efficiency renovation in buildings and sustainable transport.
- Introduce an explicit carbon tax in sectors not covered by the EU-ETS and gradually phase out remaining environmentally harmful subsidies. Redistribute revenues towards the most vulnerable households.



Overall performance



SLOVENIA

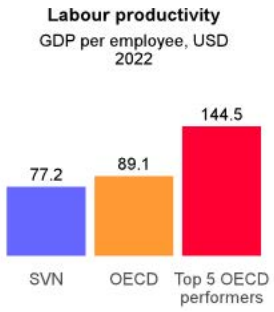
Performance gaps

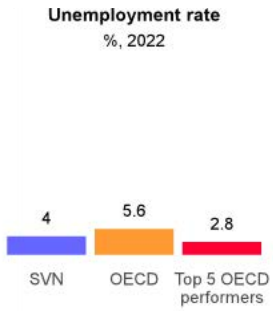
Recommendations

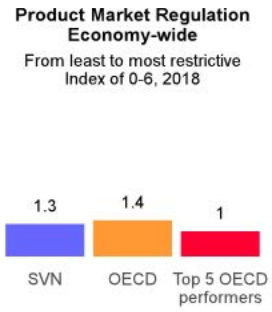
Product and labour markets functioning

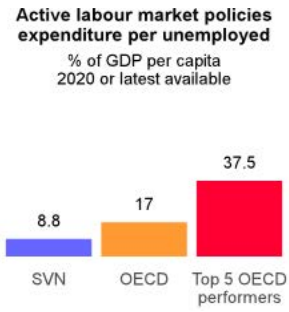
- Sectoral wage bargaining reduces the allocative efficiency of the labour market. Improving the functioning of labour reallocation will support productivity, and thus income convergence with richer OECD countries, by freeing up scarce labour resources in underperforming firms toward more productive ones.
- High labour taxes deter labour market participation. A concern is the low labour force participation of older workers.
- Widespread state-ownership is holding back business dynamism, as State-Owned Enterprises still account for a larger share of employment than elsewhere in the OECD.

- Encourage wage-setting at the firm level and determine framework conditions, such as seniority bonuses and minimum wages, at the sectoral level.
- Make the tax system more growth-friendly by further reducing labour taxes and increasing consumption and property taxes.
- Continue privatisation efforts particularly in inherently competitive sectors such as tourism and strengthen the corporate governance of State-Owned Enterprises.





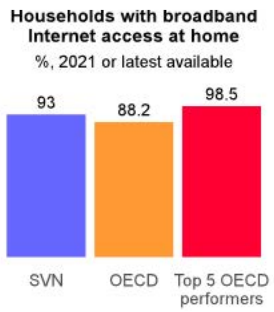


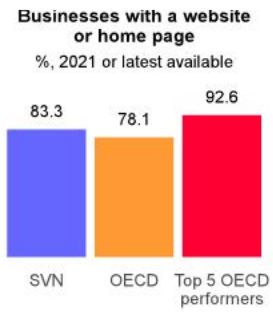


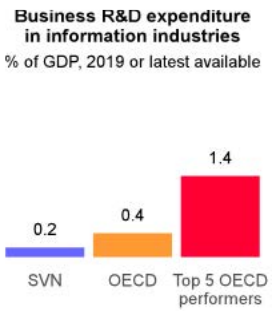
Digital transition

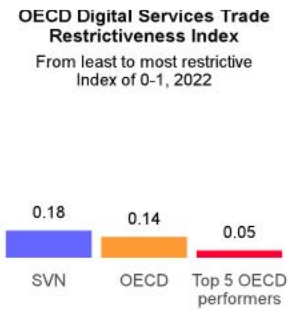
- The government has set the ambitious target to make Slovenia one of the five most digitalised EU countries. While the country performs well in mobile broadband coverage and young people's digital skills, further efforts are needed to achieve the government's objective. These include addressing the insufficient rollout of broadband in rural areas, the low use of e-government services among the population, and underdeveloped capital markets.

- Align investment subsidies to reflect actual broadband deployment costs, particularly in underserved areas.
- Move from opt-in (voluntary-based) to opt-out (compulsory-based) systems in e-government services.
- Promote digitalisation in the financial sector through evaluating the regulatory burden, and a closer alignment of FinTech regulations with other European countries.



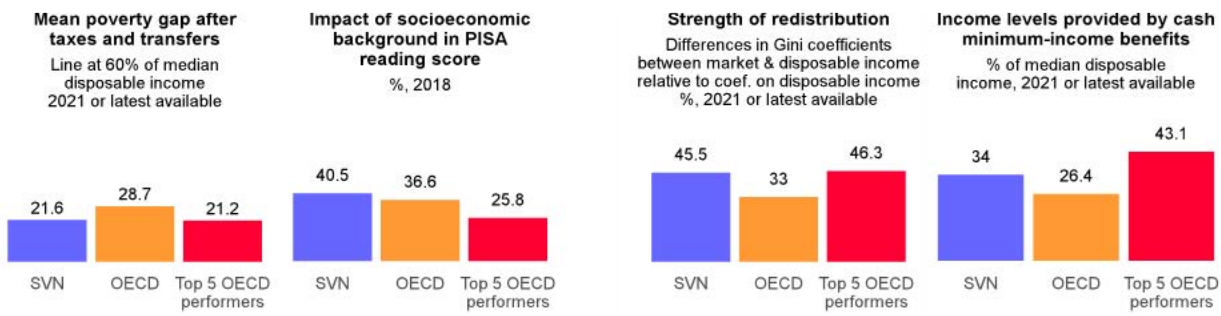






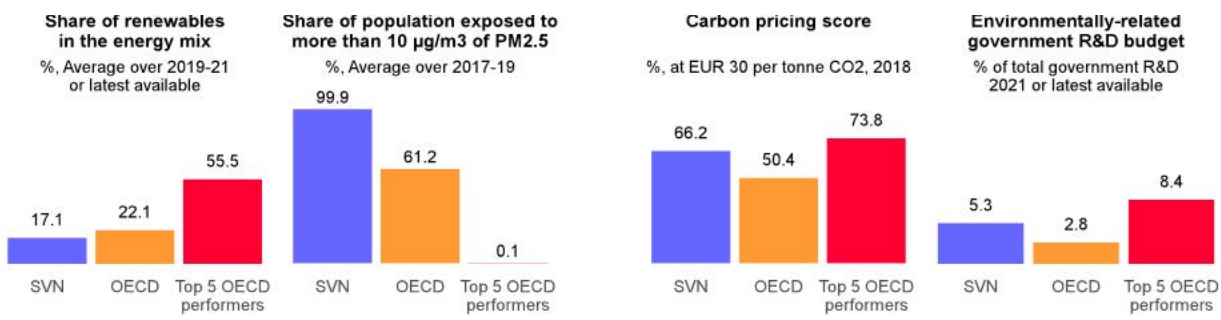
Inclusiveness, social protection, and ageing

- Pension reforms are needed to prepare for the fiscal challenges associated with population ageing. The effective retirement age is among the lowest in the EU. Together with recent unfunded increases in pension benefits, this makes for one of the highest projected pension spending increases in the OECD.
- Develop a medium-term fiscal consolidation plan to address the long-run challenges of ageing.
- Raise the minimum years of contributions required to retire and use lifetime incomes to determine pension benefits.

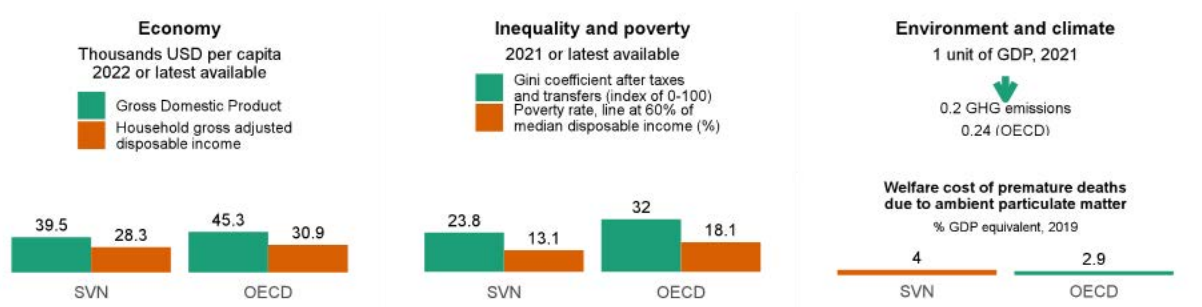


Climate transition

- Growth has become less CO2–intensive. Nonetheless, more concerted action is needed to achieve the ambitious net-zero target by 2050. Carbon pricing varies across sectors and activities, leading to varying abatement costs, and thus higher costs of achieving environmental targets.
- Introduce and gradually align carbon taxes in residential, commercial and industrial sectors.
- Phase out fossil fuel-based boilers and complement the replacement subsidy for older wood-based boilers with regulatory requirements and financial sanctions.



Overall performance



SOUTH AFRICA

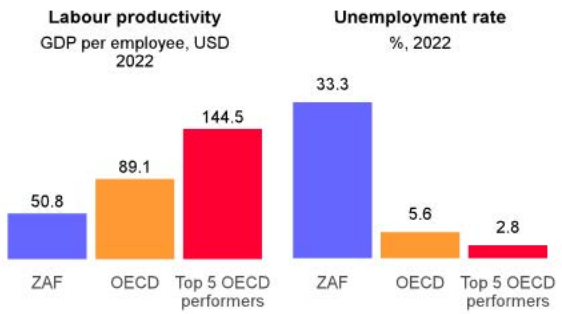
Performance gaps

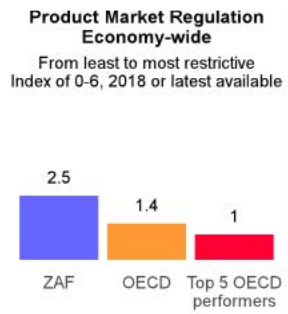
Recommendations

Product and labour markets functioning

- Regulatory policies remain restrictive and competition is low in many key network industries.
- South Africa compares unfavourably in most product market regulation indicators, in particular indicators assessing distortions induced by state involvement.

- Align sector regulators and the Competition Commission to strengthen competition policies and their enforcements.
- Privatise State-Owned Enterprises operating in competitive market segments, such as commercial banking, energy, and logistics.

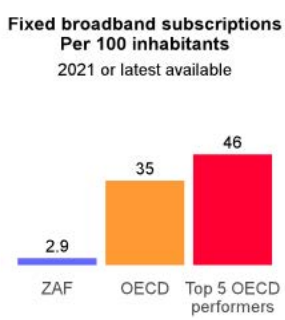


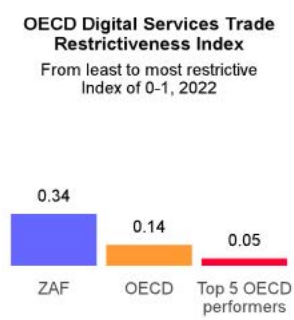


Digital transition

- Lagging telecommunication infrastructure, in particular the roll-out of fibre-optic cable, is slowing down digitalisation. Only 2.4% of inhabitants have access to high-speed internet. In addition, access to telecommunication services is highly unequal across the country.

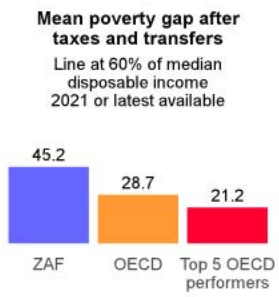
- Take advantage of any public construction works to install open-access telecom infrastructure.
- Subsidise the expansion of the network outside city centres through grants, conditional on making the infrastructure openly accessible.

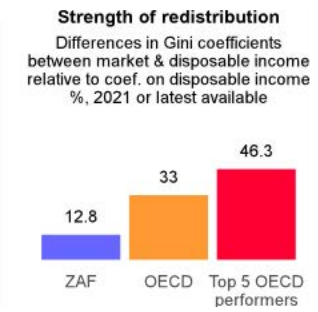




Inclusiveness, social protection, and ageing

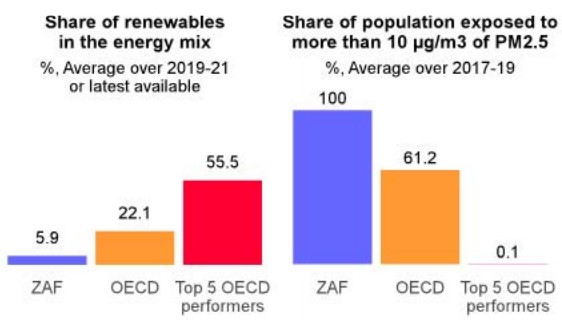
- Poverty remains high, despite an extensive and well-functioning means-tested cash-transfer system that provides support to the elderly, children, and people with disabilities. Unemployed and informal workers receive little support.
- Strengthen the social transfer system to cover unemployed individuals by, for instance, making permanent the Social Distress Relief grant introduced during the COVID-19 crisis.
- Consider the introduction of an additional means-tested benefit for households with income below the minimum subsistence line.

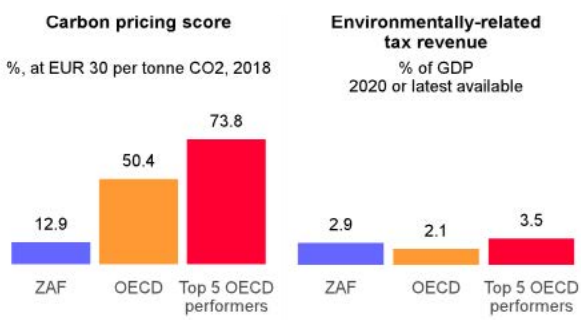




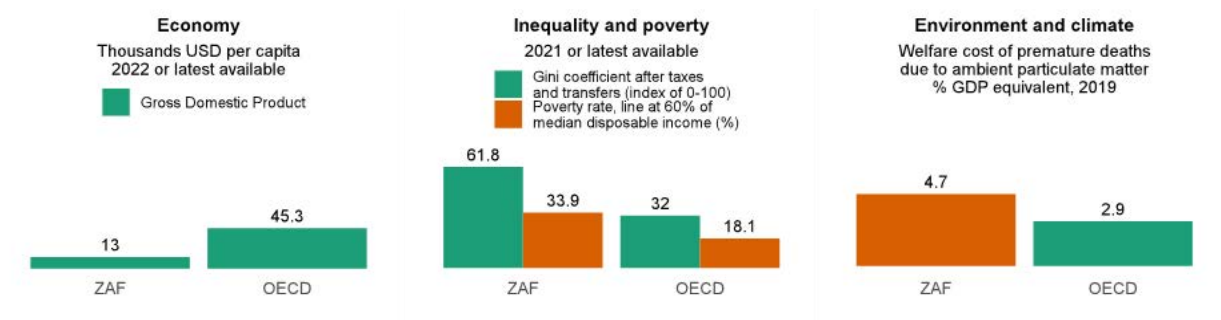
Climate transition

- CO2 emissions per unit of GDP are high, reflecting in part the high-energy intensity of the economy, but also the elevated dependence on coal as a main energy source. 80% of electricity production still comes from coal.
- Progressively reduce exemptions to the carbon tax to increase its base.
- Increase and accelerate the procurement of renewable electricity from independent power producers.





Overall performance



SPAIN

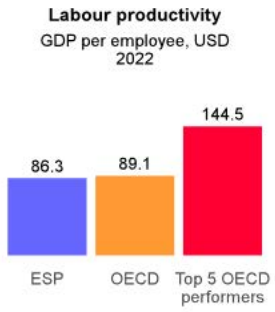
Performance gaps

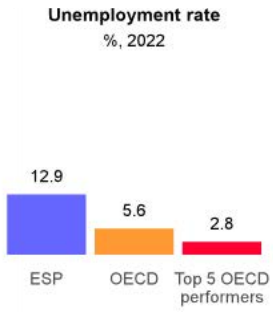
Recommendations

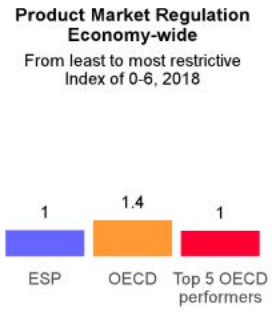
Product and labour markets functioning

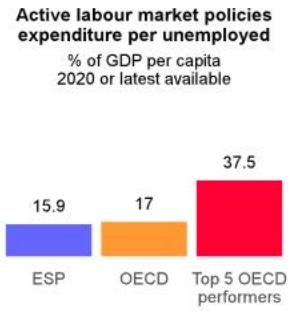
- In some sectors, such as professional services and trade, regulations are stringent and differ across regions, weighing on the expansion of burgeoning firms.
- Regulations that depend on the size of firms can hamper scaling-up.
- Labour mobility is hampered by the fact that regional reallocation implies a loss of social and housing benefits, due to prior residency requirements.

- Foster the implementation of the Market Unity Law in order to reduce regulatory differences across regions.
- Gradually eliminate the existing regulations that depend on the size of firms, as needed.
- Ensure full portability of social and housing benefits across regions, by deepening cooperation and providing temporary assistance by the region of origin or the central government.





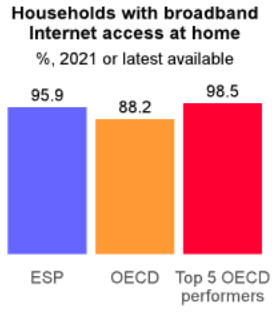


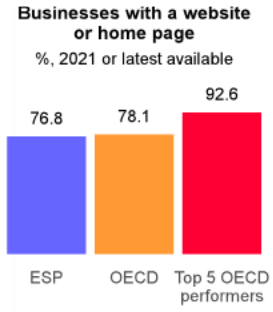


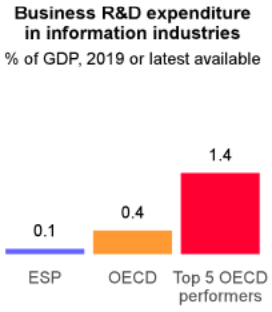
Digital transition

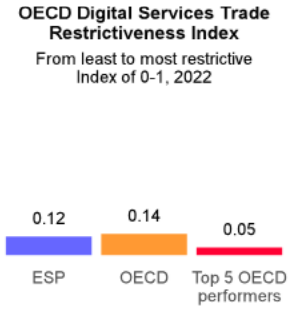
- There is room to improve the capacity of small businesses to develop R&D projects and to access new technologies.
- ICT-Training needs could be better identified, in particular by fostering the access for low-skilled and older workers.

- Support Technology Centres, which conduct R&D projects through partnerships between firms, notably SMEs, and research institutes.
- Shift a part of job training subsidies to individuals and develop ICT training programmes targeted to low-skilled and older workers.



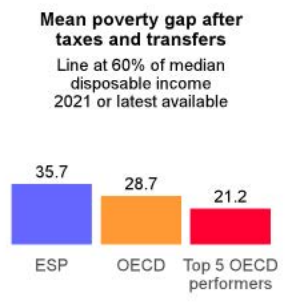


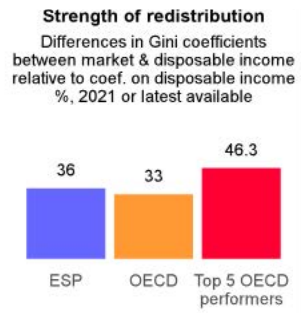


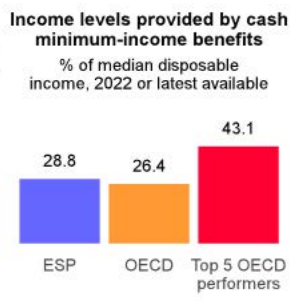


Inclusiveness, social protection, and ageing

- The unemployment rate remains higher for women than for men.
- Social assistance programmes are not fully effective at reducing poverty, due to inefficiencies in the administrative systems, complex rules, and lack of coordination.
- Unemployment and poverty rates are particularly high among young people. Skill mismatches hamper the transition from education to the labour market.
- Support early childhood education and care. Gradually remove the tax disincentives for second earners.
- Create one-stop shops to coordinate social and unemployment services and the assistance to vulnerable people.
- Foster collaboration between education institutions and businesses in designing education degrees and in counselling students to favour a better alignment between studies and labour market needs.

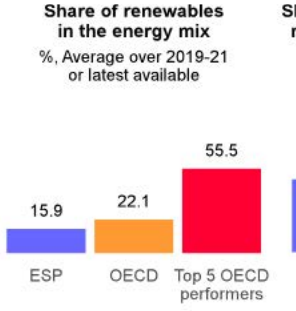


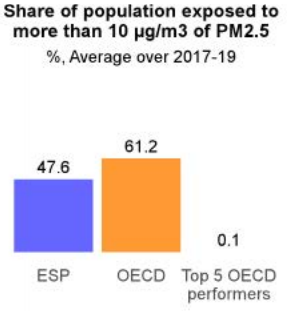


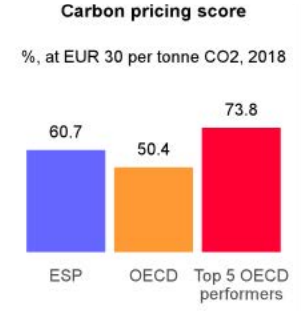


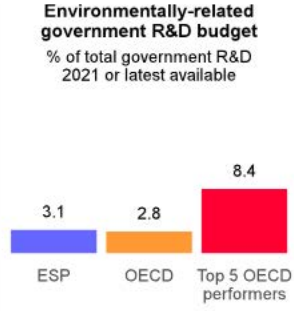
Climate transition

- Carbon pricing can be improved, for both road and non-road emissions.
- Sizeable investment and reductions in emissions will be needed to meet the ambitious climate objectives adopted in 2021.
- Taxation of fuels should be raised to better reflect emissions of CO2 and be accompanied with redistribution towards the most vulnerable.
- The already well-developed investment plans in energy saving, renovation in buildings and sustainable transport should be hastened.

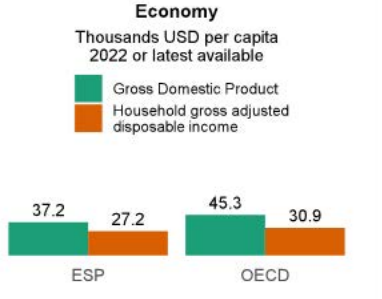


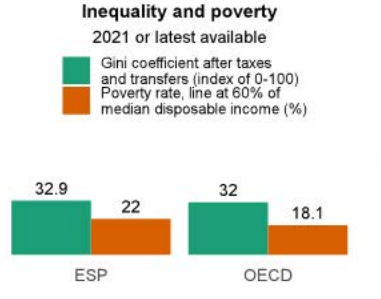


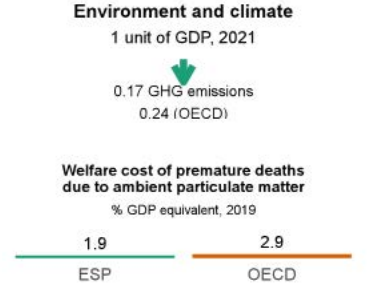




Overall performance







SWEDEN

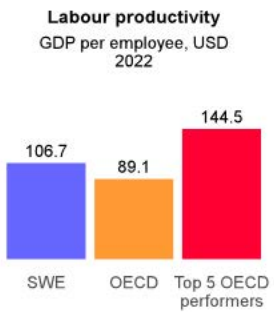
Performance gaps

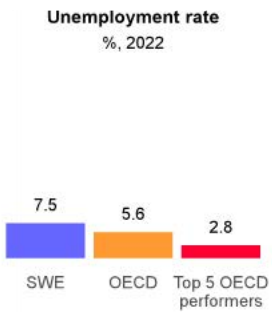
Recommendations

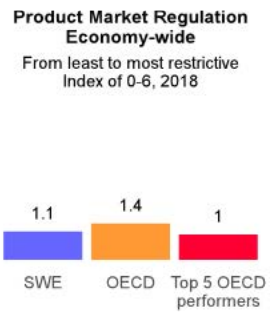
Product and labour markets functioning

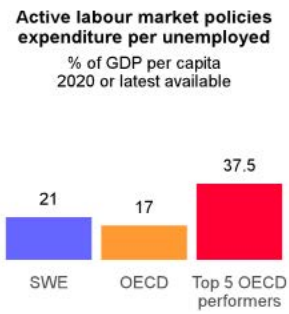
- Shortages of affordable housing in some areas hinder labour mobility, notably for low-income households, contributing to spatial segregation.
- The integration of low-skilled workers, particularly foreign-born, into the labour market remains challenging.

- Increase the supply of affordable housing in lagging regions, notably by simplifying land-use planning procedures, and by gradually easing rental regulations.
- Step up vocational education and job counselling to help the low-skilled and immigrants move towards growing sectors and better adapt to the labour market needs.





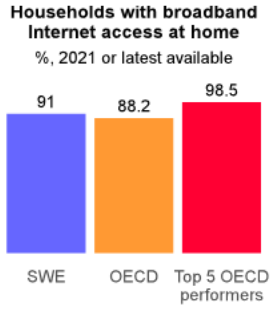


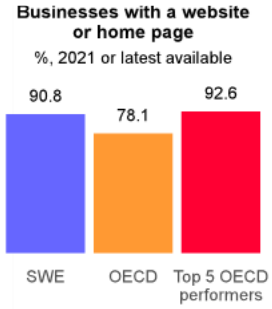


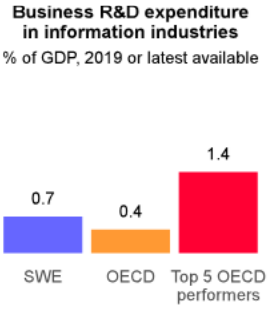
Digital transition

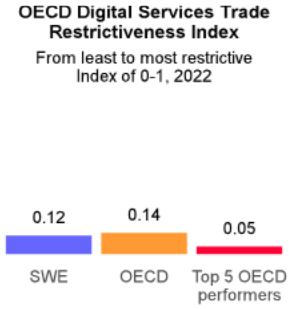
- Sweden is among the top performers in digital adoption among OECD countries, but a lack of ICT skills hinders the diffusion of digitalisation across firms.
- The share of firms reporting security breaches is high, undermining trust in ICT tools and slowing their adoption.

- Encourage students to graduate in ICT fields and develop further adult education in ICT.
- Encourage firms to implement ICT risk assessments on a periodical basis and train their employees to raise their awareness of obligations related to ICT security.



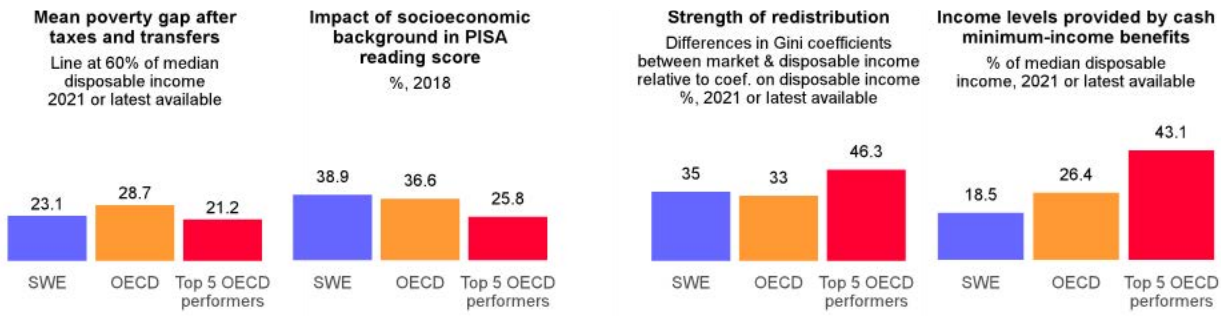






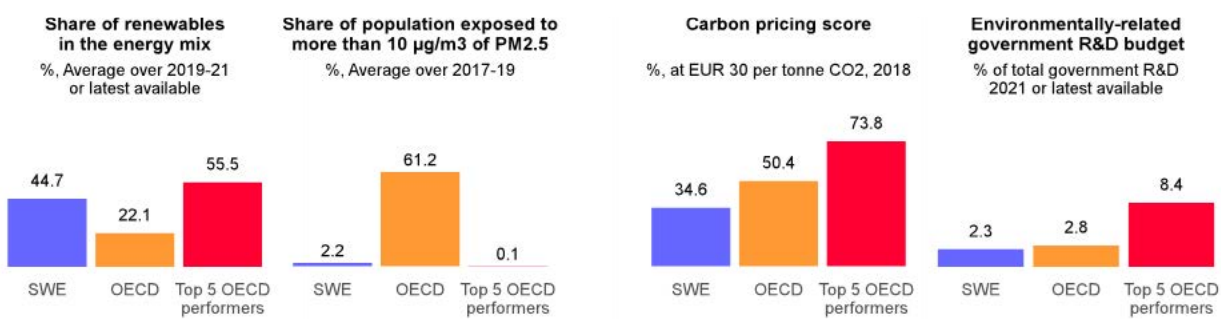
Inclusiveness, social protection, and ageing

- Regional inequality has been rising over the past decades. Large cities attract an increasing share of the younger population and enjoy higher productivity growth, while providing adequate public services to an ageing population is increasingly challenging in rural areas.
- The gender digital divide is sizeable both in terms of profession and education.
- Strengthen the role of universities in regional knowledge and innovation networks and reinforce urban-rural connectivity.
- Continue to address gender stereotypes in schools and pre-schools and promote female role models in the digital economy.

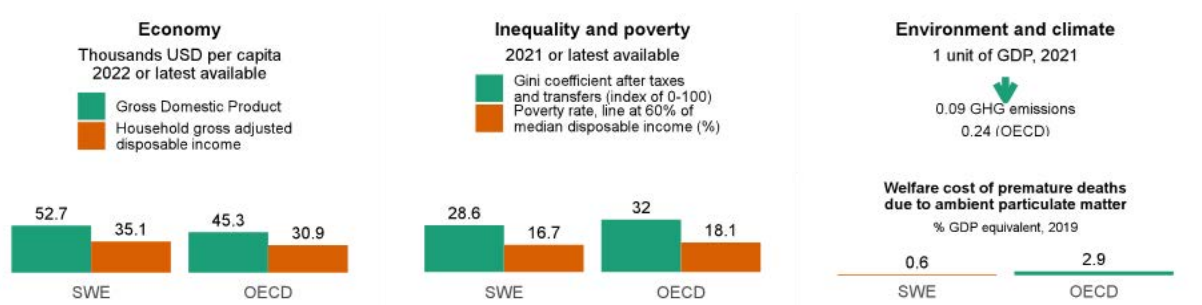


Climate transition

- Road transport accounts for about a third of total greenhouse gas emissions. The government has taken steps to reduce emissions from the sector, but a clear overall strategy is still missing.
- Slow and complex permitting procedures are slowing the expansion of renewables.
- Elaborate a roadmap for cost-efficient and technology-neutral decarbonisation of road transport.
- Streamline construction and operational permit applications for renewable energy projects.



Overall performance



SWITZERLAND

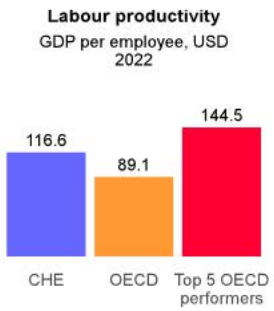
Performance gaps

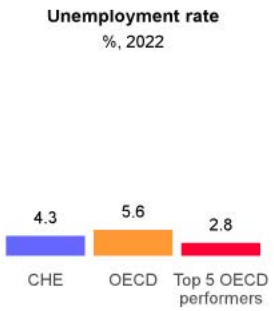
Recommendations

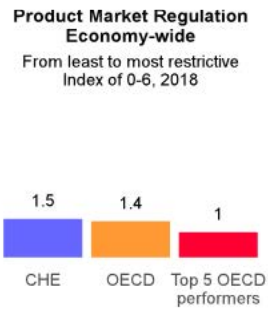
Product and labour markets functioning

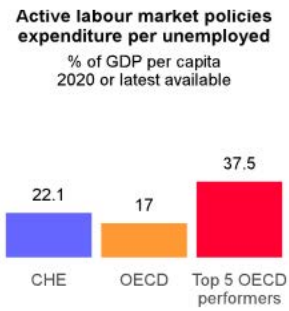
- Competition in certain domestic markets is hampered across cantonal borders. The administrative burden on start-ups is higher than in OECD top performers and resolving commercial disputes takes longer and is costlier than on average in the OECD.
- The merger control framework remains too permissive. Civil action against cartels is rare due to high complexity and short prescriptive periods. State involvement in the economy, notably in the network sectors, and the advantageous position of numerous state-owned enterprises reduces competition.

- Fully implement the Internal Market Act to ensure equal access to markets in all cantons.
- Reduce the administrative burden on start-ups. Introduce "silence is consent" licensing rules.





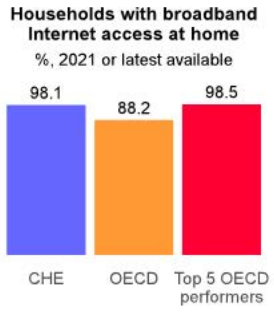


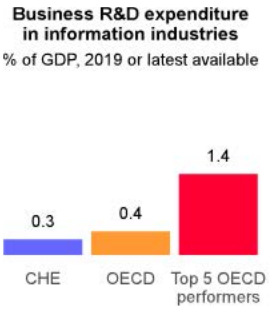


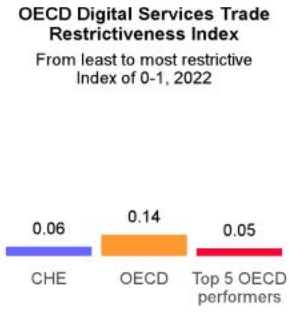
Digital transition

- The share of Swiss adults with advanced IT-related skills is high. Raising digital skills further will be essential to foster stronger productivity growth and alleviate skills shortages.
- Participation in life-long learning is high overall, but significantly lower for low-skilled workers or those out of work. E-government services are improving but further digitalisation could reduce administrative burden.

- Better target skills training to low-income workers, thereby allowing them to benefit from the digital transformation.
- Subsidise employer-provided adult skills training, including IT.
- Expand the use of digital tools to enhance services and simplify procedures at all levels of government.

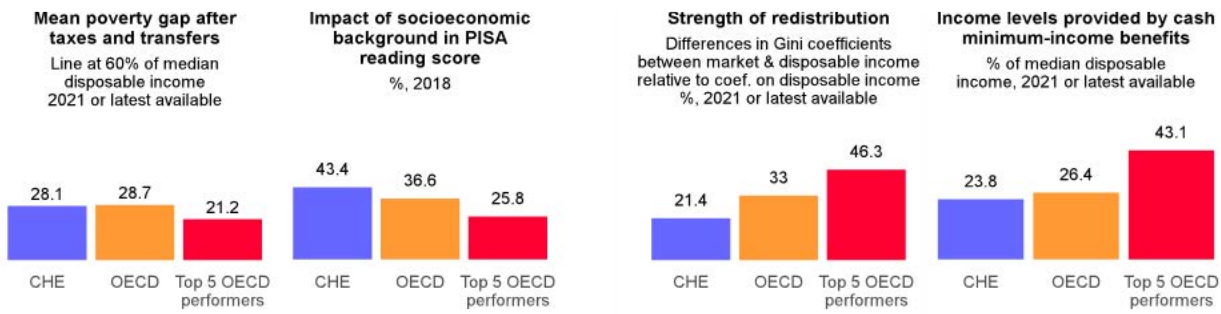






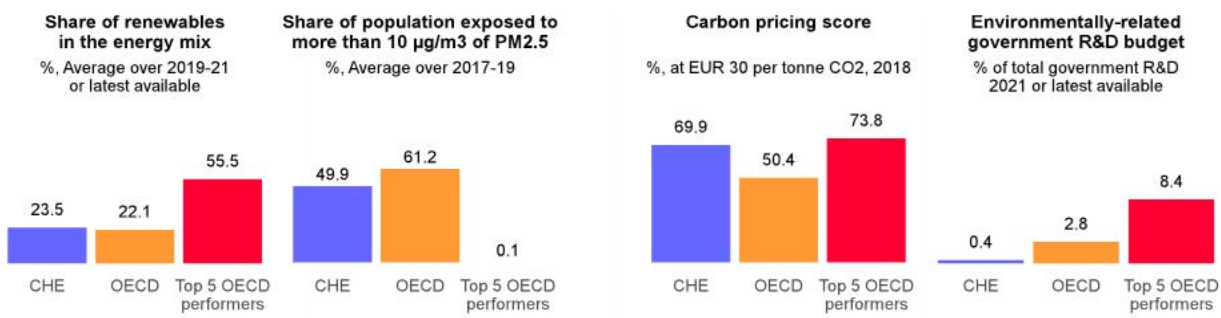
Inclusiveness, social protection, and ageing

- The population is ageing rapidly. Pension replacement rates from the mandatory pension system are set to drop significantly.
- The gender income gap is high, in part due to high incidence of part-time employment among women. The tax and benefit systems combined with a high cost of childcare result in lower working hours and lower labour incomes for women.
- Link the retirement age to life expectancy.
- Expand the supply of childcare and provide targeted means-tested fee reductions, childcare benefits, or tax credits to improve affordability.
- Reduce disincentives to work for second earners, by moving from family based to individual-based taxation or through tax adjustments and slower withdrawal of benefits.

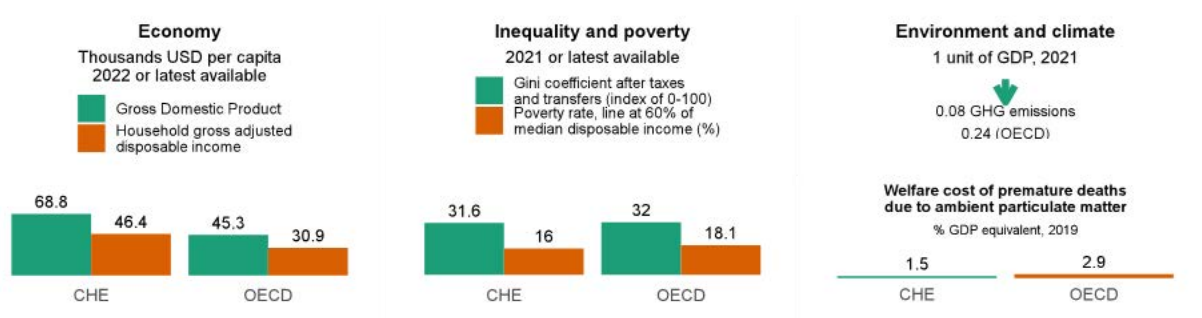


Climate transition

- Switzerland prices its CO2-emissions at high rates, but various exemptions distort the link between market signals and the costs of environmental damage across sectors.
- The Swiss financial sector has a global outreach but is still heavily invested in oil and coal extraction and much less in renewable energy or CO2-neutral mobility, despite significant progress in recent years.
- Continue efforts to broaden the base of the carbon tax by reassessing exemptions and align pricing of CO2 emissions with international climate cost benchmarks.
- Continue increasing transparency in relation to climate footprint of financial portfolios.



Overall performance



TÜRKIYE

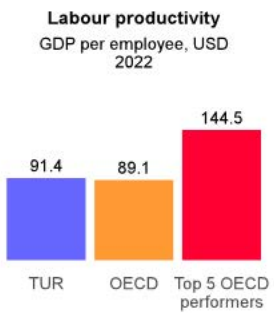
Performance gaps

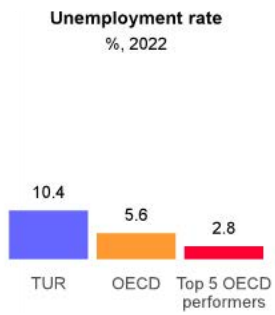
Recommendations

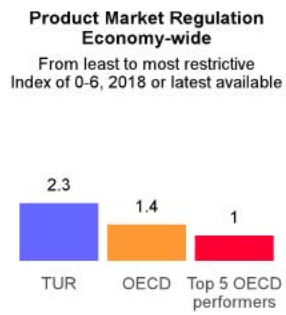
Product and labour markets functioning

- Complex and burdensome administrative procedures to obtain permits, licences, or concessions hold back the creation of formal firms.
- Complex and burdensome technical and legal procedures hinder cross-border trade.

- Create a one-stop shop where all licenses and authorisations can be issued.
- Apply the "silence-is-consent" principle to reduce the administrative burden related to obtaining permits and licences.
- Streamline technical and legal procedures for products entering or leaving the country.



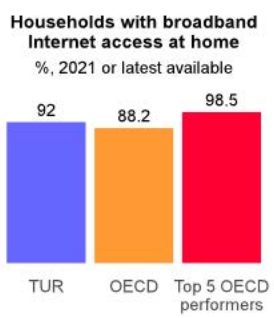


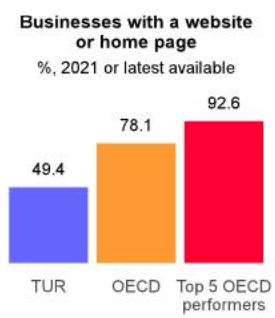


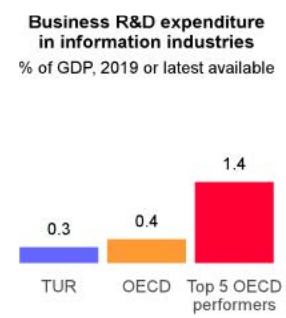
Digital transition

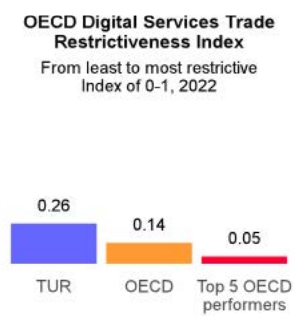
- The number of fixed broadband subscriptions at higher speed tiers across households and firms is low in international comparison.
- Most adults shows no or only basic proficiency in problem-solving in technology-rich environments, while almost 40% of adults report no computer experience.

- Consider an in-depth review of competition on broadband networks to address the low uptake of broadband subscriptions, in particular at higher speed tiers.
- Develop a holistic strategy for raising digital skills and better mainstream digital skills in school curricula.



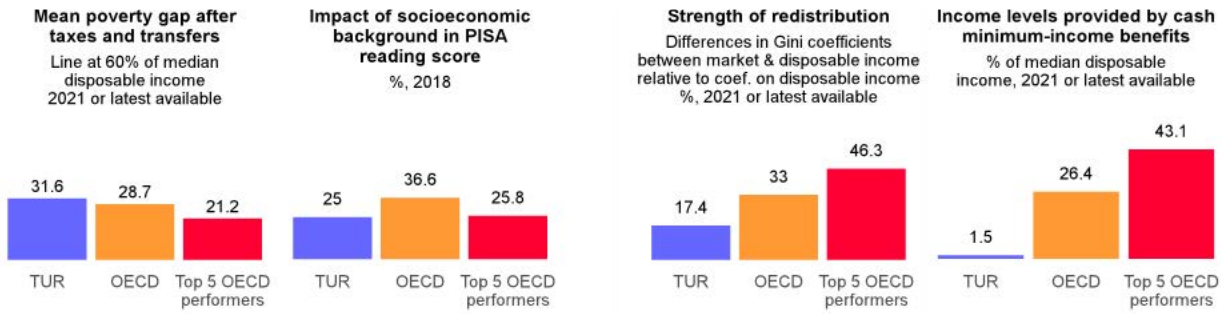






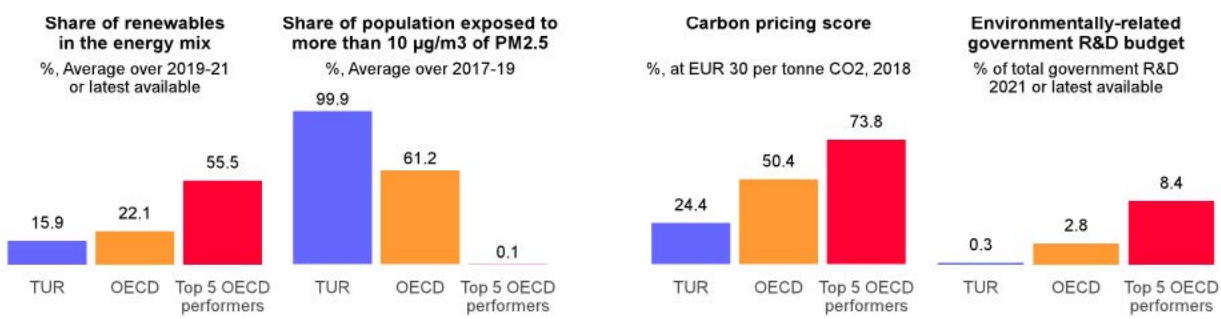
Inclusiveness, social protection, and ageing

- The pandemic and declining growth just prior to it reversed the declining poverty trend experienced since the early 2000s, exacerbating income inequalities. Moreover, high inflation is having a particularly negative effect on vulnerable groups.
- Youth face poor labour market prospects. One fifth of the 15-24-year-olds are unemployed and many young women are neither employed nor in education or training.
- Make regulations governing permanent work contracts more flexible and increase the scope for fixed-term and temporary work contracts.
- Provide additional targeted and temporary fiscal support to vulnerable groups where needed.
- Continue to facilitate labour force participation of women, including by expanding access to quality childcare and early education.
- Combine modern learning standards and curricula with new teaching methods in primary schools.

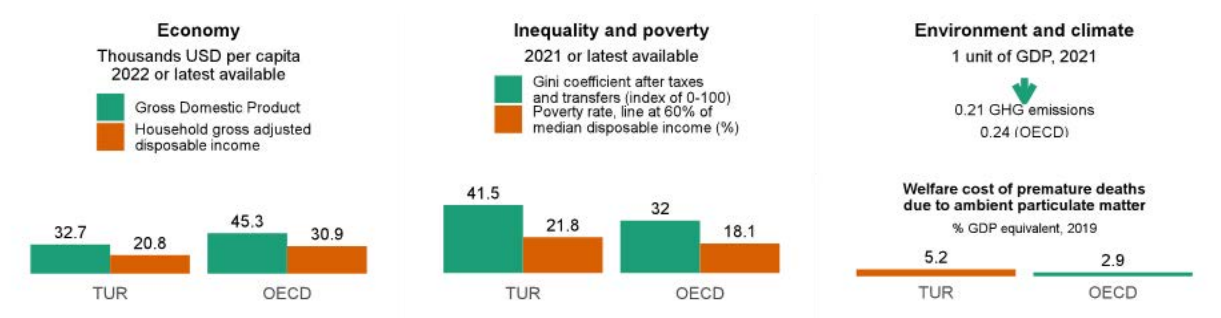


Climate transition

- Türkiye is vulnerable to climate change. Almost one third of its surface area is at high risk of land degradation and desertification. Moreover, while greenhouse gas emissions per capita are below OECD average, they have grown at the fastest pace in the OECD over the past decade, with coal accounting for almost half of emissions. Support to use coal in power generation and for heating is high.
- Make carbon pricing more consistent across sectors.
- Gradually scrap the various subsidies to coal, while compensating poorer households by targeted income support programmes.



Overall performance



UNITED KINGDOM

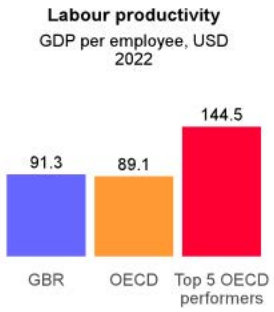
Performance gaps

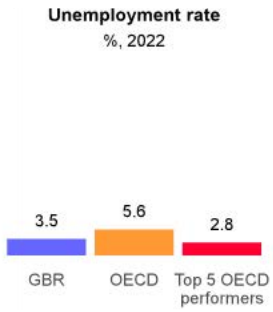
Recommendations

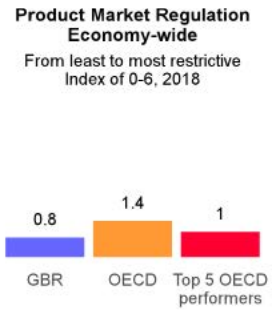
Product and labour markets functioning

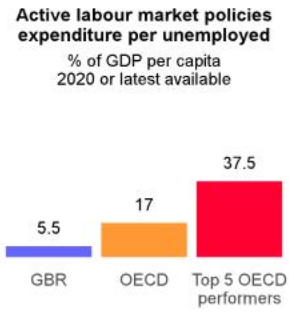
- While the United Kingdom has competition friendly product market regulations that should support investment, uncertainties following the 2016 Brexit referendum and, more recently, the pandemic, weighed on aggregate private investment.

- Ensure long-term policy transparency and continuity of government programmes to reduce uncertainties for businesses.





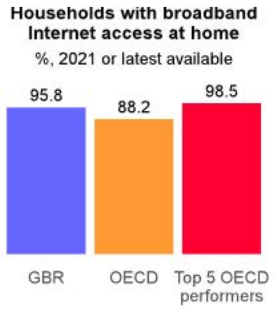


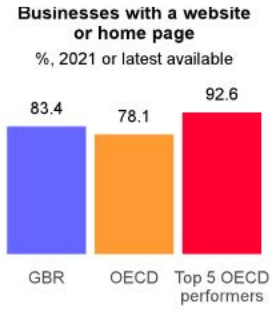


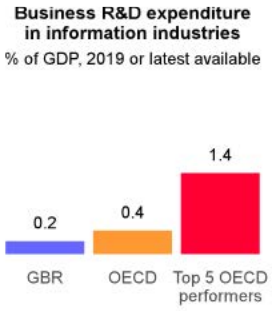
Digital transition

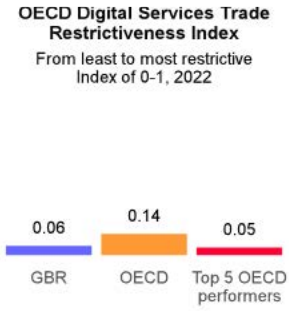
- Increasing digitalisation and transitioning to net zero will require intensifying adoption of new technologies. This implies an ever-growing need for workers to update their skills, but participation in continuing education and training is low. Adding to existing skill-shortages, quickly rising demand for skills requires re- and upskilling the existing workforce.
- Uncertainty regarding future policy stringency for achieving net zero by 2050 holds back necessary private investment.

- Use statistical tools to target training to low skilled workers affected by digitalisation and the green transition to strengthen their skills to transition to new jobs.
- Ensure that training opportunities for adults are of high quality, respond to identified skills needs and help to develop digital skills of low-skilled workers.
- Build on the Net Zero Strategy, with further concrete deadlines, policies and priorities in line with legal targets.





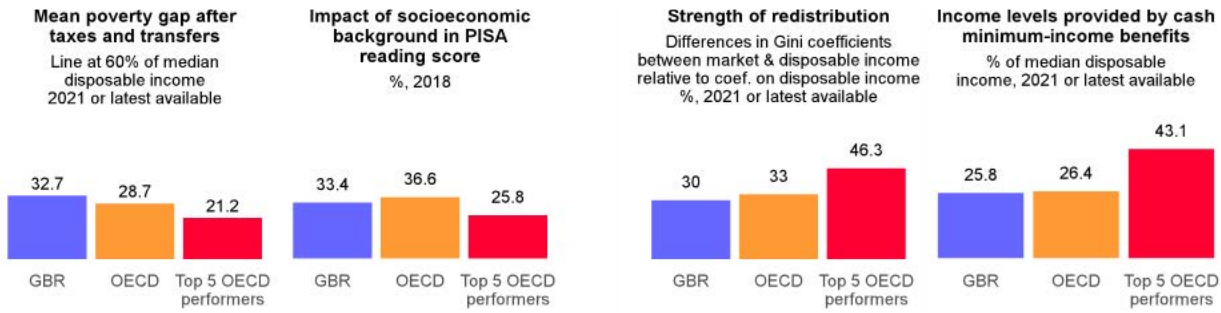




Inclusiveness, social protection, and ageing

- Women are highly educated, but a third of women work part-time, roughly three times more than men. Mothers are likely to reduce working hours following childbirth. Parental leave for fathers is short and combined with low pay replacement rates and a relatively high out-of-pocket price for childcare. Limited incentives are provided to shift leave to fathers, contributing to gender gaps in labour participation and earnings.
- In the longer term, fiscal space will be under pressure as age-related spending is rising. The current pension uprating (triple lock) will be costly in the future

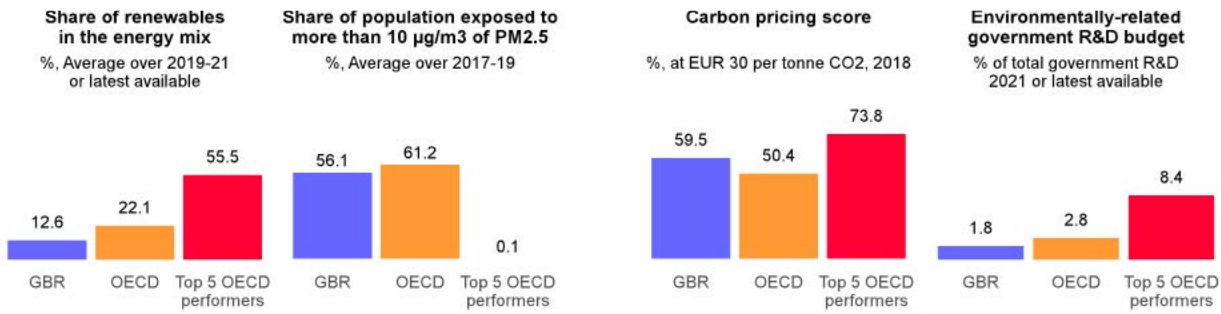
- Increase funding to reduce the cost of good-quality childcare, in particular for under two-year-olds, giving priority to low-income households, as announced in the 2023 Spring Budget.
- Increase the cap on paternity pay and relate it to father's income.
- Replace the state pensions triple lock by indexing pensions to an average of CPI and wage inflation and provide direct transfers to poor pensioners to mitigate poverty risks.



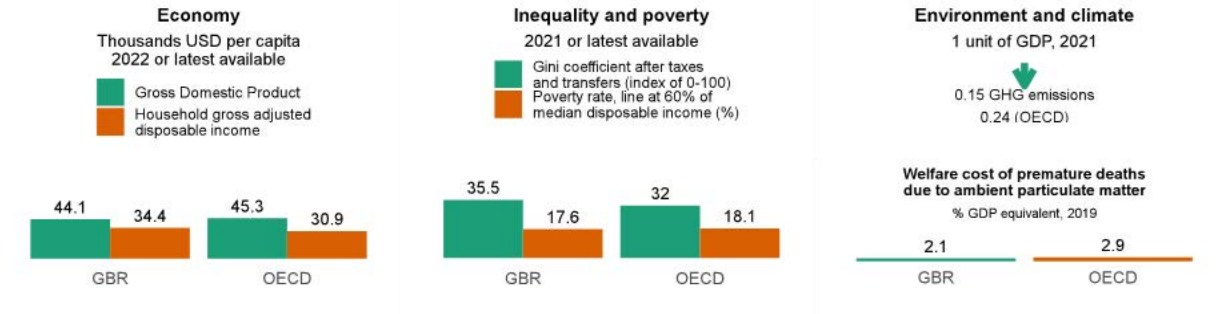
Climate transition

- The United Kingdom has successfully reduced greenhouse gas emissions in the past, and a broad political consensus supports the target to reduce net emissions to zero by 2050. Emission reductions so far were largely driven by electricity generation, a sector targeted by the emission trading scheme (ETS), a carbon price floor and a cost-efficient renewables auction-design subsidy scheme. A landfill tax and the ETS also drove down emissions in other sectors.
- Carbon pricing and regulation will in the absence of flanking policies hit low-income households, those in rural areas and those with high heating needs disproportionally.

- Commit to gradually expand the UK ETS to all emitting sectors and tighten the emissions cap in line with targets.
- Target households' energy use with specific regulations to phase in higher energy efficiency, clean heating and zero-emission vehicles.
- Allocate a portion of carbon pricing revenues to schemes compensating low-income and fuel-poor households and supporting their green investments.



Overall performance



UNITED STATES

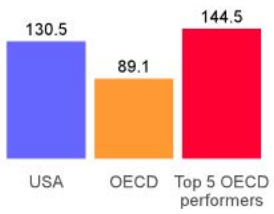
Performance gaps

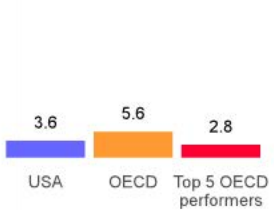
Recommendations

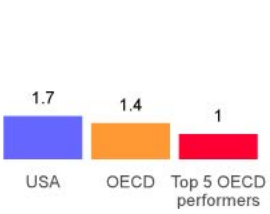
Product and labour markets functioning

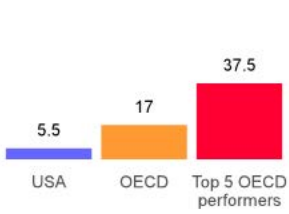
- Competition in labour markets is impeded by the frequent use of non-compete agreements and occupational licenses in areas other than those requiring licensing for public health and safety reasons. In addition, there is inconsistent treatment of occupational licenses across states. Some population groups are particularly exposed to excessive licensing requirements, such as individuals with a criminal record, and immigrants.

- Further encourage states to delicense occupations raising very limited concerns for public health and safety, and act against anticompetitive behaviour.
- Address excessive employment barriers that create obstacles for ethnic minorities and foreign nationals.
- Outlaw the use of non-competes except where employers can prove benefit to workers.





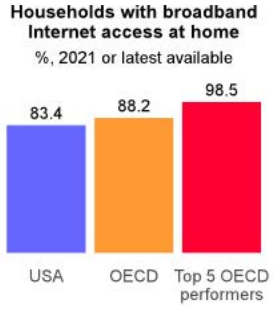


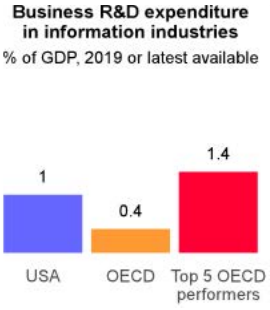


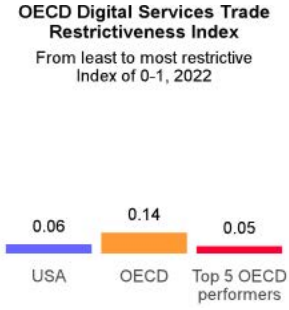
Digital transition

- Public investment in broadband infrastructure is increasing, closing large coverage gaps in certain parts of the country. Digital infrastructure has important linkages to other sectors of the economy, but the United States does not make use of national cross-sectoral infrastructure plans.

- Continue to update and improve public digital infrastructure.
- Establish a dedicated federal institution tasked with ongoing cross-sectoral and cross-state advisory about infrastructure priorities and best practices.

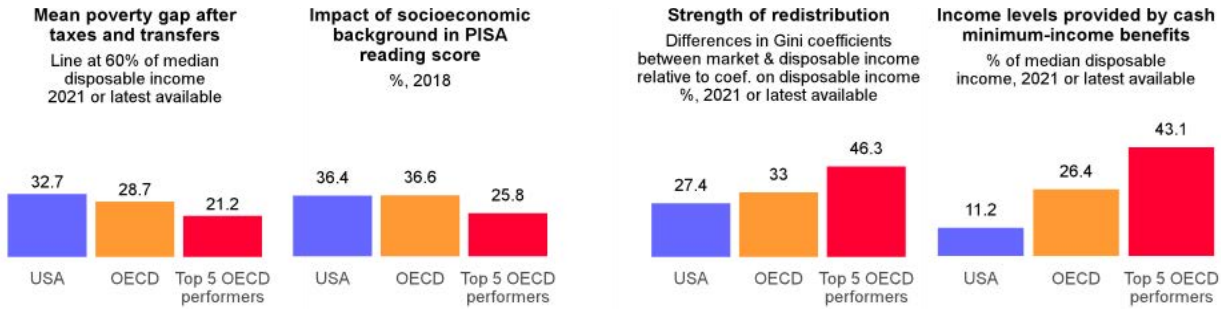






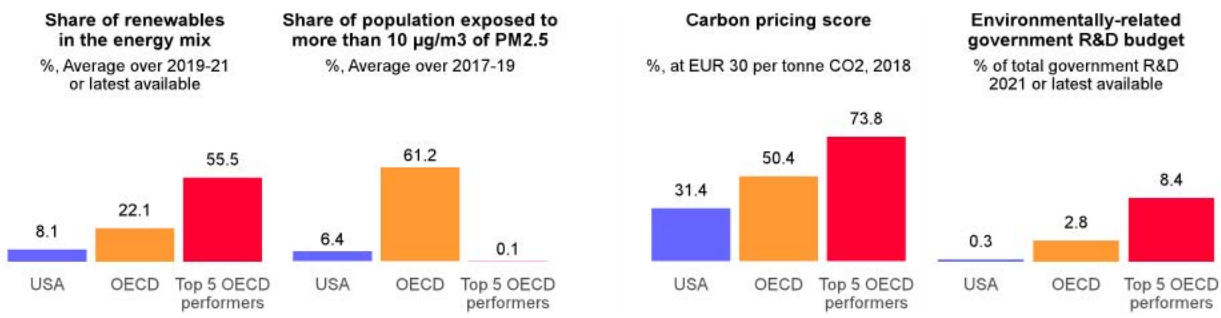
Inclusiveness, social protection, and ageing

- The ratio of the minimum wage to the median wage is substantially lower than in other OECD countries.
- For those not working, expenditure on active labour market policies per unemployed is also relatively low. In addition, benefit recipients in many states experience significant delays in the processing of their unemployment claims.
- Increase the Federal minimum wage.
- Continue to modernise and streamline unemployment insurance systems, strengthening integration with job search assistance and training schemes.
- Raise public expenditure on active labour market policies, with a focus on job placement and cost-effective retraining policies.

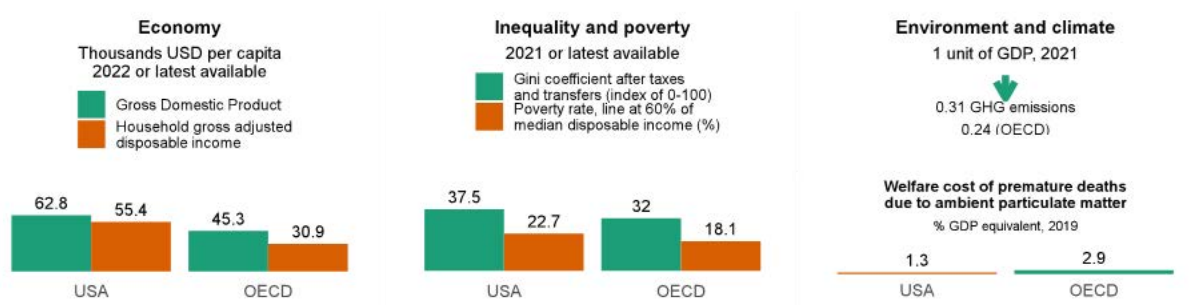


Climate transition

- Total greenhouse gas emissions have steadily fallen since 2004, driven by a shift in the energy mix. Nevertheless, emissions intensity remains one of the highest in the OECD and needs to decline significantly to achieve emission reduction targets. The transportation and residential sectors collectively account for around 42% of total greenhouse gas emissions.
- Further expand existing weatherisation and retrofitting programmes to cover middle-income households.
- Provide fiscal incentives for states to update their building energy codes.
- Accelerate the tightening of fuel efficiency and tailpipe CO2 standards.



Overall performance



Metadata Annex

Product and labour markets functioning

Labour productivity (GDP per employee, USD, 2022)

Gross Domestic product at constant 2015 prices and PPPs per employee.

The last available year is 2021 for India.

Source: OECD National Accounts, Productivity and Economic Outlook Databases.

Unemployment rate (%, 2022)

The unemployed are people of working age who are without work, are available for work, and have taken specific steps to find work. This indicator is measured in numbers of unemployed people as a percentage of the labour force and is seasonally adjusted. The labour force is defined as the total number of unemployed people plus those in employment. Data are based on labour force surveys (LFS).

The last available year is 2021 for Argentina; 2019 for Indonesia.

Source: OECD Labour Force Statistics Database and China National Bureau of Statistics.

Product Market Regulation: Economy-wide (From least to most restrictive, Index of 0-6, 2018)

The economy wide PMR indicators measure the regulatory barriers to firm entry and competition in a broad range of key policy areas, ranging from licensing and public procurement to governance of SOEs, price controls, evaluation of new and existing regulations, and foreign trade.

The last available year is 2020 for China, Indonesia and Peru; 2019 for Bulgaria, Croatia, Romania and the United States.

Source: OECD, Product Market Regulation 2018 Database, https://www.oecd.org/economy/reform/indicators-of-product-market-regulation/

Active labour market policies expenditure per unemployed (% of GDP per capita, 2020 or latest available)

The last available year is 2019 for Bulgaria, Ireland, Israel, Japan, Korea, Lithuania, the Netherlands, Poland and the Slovak Republic; 2018 for Australia, Canada, New Zealand and the United States; 2011 for the United Kingdom.

Source: OECD, Labour Market Policies and Economic Outlook Databases; Eurostat.

Rule of Law (From least to most confidence, score from -2.5 to 2.5, 2021)

Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e., ranging from approximately -2.5 to 2.5.

Source: World Bank, Worldwide Governance Indicators.

Digital transition

Households with broadband internet access at home (%, 2021 or latest available)

The last available year is 2022 for Korea; 2020 for Canada, Colombia and Japan; 2019 for the United Kingdom; 2018 for Israel; 2017 for Australia and Chile.

Source: OECD Information and Communication Technology Database and OECD Regions and Cities Database.

Businesses with a website or home page (%, 2021 or latest available)

All businesses (10 persons employed or more).

The last available year is 2022 for New Zealand; 2020 for Belgium, Colombia, Denmark, Estonia, the United Kingdom, Israel and Japan; 2019 for Australia; 2018 for Iceland.

Source: OECD Information and Communication Technology Database.

Fixed broadband subscriptions per 100 inhabitants (2021 or latest available)

Fixed broadband subscriptions refer to fixed subscriptions to high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This includes cable modem, DSL, fibre-to-the-home/building, other fixed (wired)-broadband subscriptions, satellite broadband and terrestrial fixed wireless broadband. This total is measured irrespective of the method of payment. It excludes subscriptions that have access to data communications (including the Internet) via mobile-cellular networks. It should include fixed WiMAX and any other fixed wireless technologies. It includes both residential subscriptions and subscriptions for organisations.

Source: World Bank, World Development Indicators.

Business R&D expenditure in information industries (% of GDP, 2019 or latest available)

Business enterprise expenditure in R&D (BERD) in information industries (ISIC 26+58-63), irrespective of funding source. The ICT manufacturing and services sectors, along with the content and media sector, are collectively known as the "information industries". Information industries play a key role in driving digital transformation forward. Ever-faster connectivity, deployment of the Internet of Things, and increasing data flows all rely on continuous investments in hardware, software, and communications infrastructures. Meanwhile, businesses adoption of digital tools and new business models enabled by digital technologies – such as cloud computing – are changing the composition and nature of the information industries.

The last available year is 2020 for China, the Czech Republic, Iceland, Japan, Korea, New Zealand and the Slovak Republic; 2018 for Chile; 2017 for France and the Netherlands; 2011 for Luxembourg.

Source: OECD Going Digital Toolkit, https://goingdigital.oecd.org/indicator/31.

OECD Digital Services Trade Restrictiveness Index (From least to most restrictive, Index of 0-1, 2022)

The OECD Digital Services Trade Restrictiveness Index (DSTRI) measures cross-cutting barriers that inhibit or completely prohibit firms' ability to supply services using electronic networks, regardless of the sector in which they operate. It includes five measures: 1) infrastructure and connectivity, 2) electronic transactions, 3) e-payment systems, 4) intellectual property rights and 5) other barriers to trade in digitally enabled services. The index takes values between 0 and 1, where 0 indicates an open regulatory environment for digitally enabled trade and 1 indicates a completely closed regime.

Source: OECD Industry and Services Database.

Performance of digital public services, eGovernment Benchmark (score of 0-100, 2022)

The Digital Economy and Society Index (DESI) is a composite index that summarises relevant indicators on Europe's digital performance and tracks the evolution of EU Member States in digital competitiveness. The DESI Index addresses five main areas: connectivity, human capital, use of internet, integration of digital technology and digital public services. The eGovernment Benchmark compares how governments across Europe deliver digital public services. Four dimensions are used to evaluate online public services (User Centricity, Transparency, Key Enablers and Cross-Border Services).

Source: European Commission: https://digital-strategy.ec.europa.eu/en/library/egovernment-benchmark-2022.

Inclusiveness, social protection, and ageing

Mean poverty gap after taxes and transfers (line at 60% of median disposable income, 2021 or latest available)

The poverty gap is the ratio by which the mean income of the poor falls below the poverty line. The poverty line is defined as 60% the median household income of the total population.

The last available year is 2021 for Costa Rica, Finland, Latvia, the Netherlands, Norway, Sweden and the United States; 2020 for Australia, Austria, Belgium, Bulgaria, Croatia, Czech Republic, Estonia, Greece, Hungary, Ireland, Israel, Italy, Korea, Lithuania, Luxembourg, Mexico, New Zealand, Poland, Portugal, Romania, Slovenia, Spain and the United Kingdom; 2019 for Denmark, France, Germany, Switzerland, Türkiye and the Slovak Republic; 2018 for Japan; 2017 for Chile, Iceland and South Africa.

Source: OECD, Income Distribution Database.

Poverty gap at $3.65 a day (%, 2021 or latest available)

Poverty gap is the mean shortfall in income or consumption from the poverty line $3.65 a day (2017 PPP, counting the nonpoor as having zero shortfall), expressed as a percentage of the poverty line. This measure reflects the depth of poverty as well as its incidence.

The last available year is 2022 for Indonesia; 2019 for China and India.

Source: World Bank, World Development Indicators.

Impact of socio-economic background in PISA reading score (%, 2018)

Score-point difference in reading performance associated with a one-unit increase in PISA index of economic, social and cultural status (ESCS). The ESCS is a composite measure combining into a single score the financial, social, cultural and human-capital resources available to students. The index is derived from equally weighted components such as students' parents' education and occupations, and an index summarising a number of home possessions considered as proxies for material wealth or cultural capital, such as possession of a car, the existence of a quiet room to work, access to the Internet, the number of books and other educational resources available in the home.

Source: OECD PISA Database, https://www.oecd.org/pisa/data/

Strength of redistribution (differences in Gini coefficients between market and disposable income relative to coefficients on disposable income, %, 2021 or latest available)

The Gini coefficient ranges from 0 in the case of "perfect equality" (each person receives the same income) and 100 in the case of "perfect inequality" (all income goes to the person with the highest income). Gini coefficients at disposable (equivalised household) incomes are post-taxes and social transfers and adjusted for differences in the needs of households of different sizes with an equivalence scale that divides household income by the square root of household size.

The last available year is 2021 for Costa Rica, Finland, Latvia, the Netherlands, Norway, Sweden and the United States; 2020 for Australia, Austria, Belgium, Bulgaria, Croatia, Czech Republic, Estonia, Greece, Hungary, Ireland, Israel, Italy, Korea, Lithuania, Luxembourg, Mexico, New Zealand, Poland, Portugal, Romania, Slovenia, Spain and the United Kingdom; 2019 for Denmark, France, Germany, Switzerland, Türkiye and the Slovak Republic; 2018 for Japan; 2017 for Chile, Iceland and South Africa.

Source: OECD Income Distribution Database.

Income levels provided by cash minimum-income benefits (% of median disposable income, 2022 or latest available)

This indicator measures the income of selected jobless families that claim Guaranteed Minimum Income (GMI) benefits. When the country's poverty line is defined as a fixed percentage of the median disposable income, the normalization of GMI amounts in terms of the median disposable income allows measuring the gap between benefit entitlements and the poverty line. For instance, if the poverty threshold is 50% of the median disposable income, a value of the indicator of 30% means that benefit entitlements are 20 percentage points below the poverty line.

The last available year is 2021 for Canada and Israel; 2016 for Chile.

Source: OECD Social protection and Well-being Database.

Share of working-age population (15-64) in total (%, 2022)

The last available year is 2021 for China.

Source: OECD Labour Force Statistics Database and China National Bureau of Statistics.

Climate transition

Share of renewables in the energy mix (%, average over 2019-21 or latest available)

Renewable energy is defined as the contribution of renewables to total primary energy supply (TPES). Renewables include the primary energy equivalent of hydro (excluding pumped storage), geothermal, solar, wind, tide, and wave sources. Energy derived from solid biofuels, bio gasoline, biodiesels, other liquid biofuels, biogases, and the renewable fraction of municipal waste are also included.

Average over the period 2018-20 for Bulgaria, China, Croatia, Indonesia, India, Peru, Romania and South Africa.

Source: OECD Environment Database.

Share of population exposed to more than 10 µg/m³ of PM2.5 (%, average over 2017-19 or latest available)

Fine particulate matter ($PM_{2.5}$) is the air pollutant that poses the greatest risk to health globally, affecting more people than any other pollutant. Chronic exposure to PM2.5 considerably increases the risk of respiratory and cardiovascular diseases. Population exposure to more than 10 Micrograms per cubic metre and are expressed as annual averages.

Source: OECD Environment Database.

Carbon pricing score (%, at EUR 30 per tonne CO2, 2018)

The carbon pricing score (1- carbon pricing gap) shows how close countries are to pricing carbon in line with carbon costs. Including emissions from the combustion of biomass.

Source: OECD Effective Carbon Rates 2021 Database.

Environmentally related government R&D budget (% of total government R&D, 2021 or latest available)

Government budget for R&D refers to Government Budget Appropriations or Outlays for Research and Development (GBAORD), that measure the funds that government allocate to R&D to meet the socioeconomic objective "environment" which includes research directed at the control of pollution and on developing monitoring facilities to measure, eliminate and prevent pollution. It is expressed as a percentage of all-purpose GBAORD.

The last available year is 2020 for Colombia, Israel, Korea and the United Kingdom; 2019 for Chile and Iceland; 2017 for New Zealand; 2016 for Canada; 2012 for Argentina.

Source: OECD Green Growth Database.

Environmentally related tax revenue (% of GDP, 2019 or latest available)

Environmentally related taxes are an important instrument for governments to shape relative prices of goods and services and to construct environmentally related tax revenues in several domains (energy products, motor vehicles and transport services, emissions to air and water, ozone depleting substances, certain non-point sources of water pollution, waste management and noise, management of water, land, soil, forests, biodiversity, wildlife and fish stocks).

The last available year is 2019 for Costa Rica and South Africa; 2018 for India.

Source: OECD Green Growth Database.

Overall performance

Economy

Gross Domestic product (thousands USD per capita, 2022 or latest available)

Gross Domestic product at constant 2015 prices and PPPs per capita.

The last available year is 2021 for Argentina, China, Indonesia and Peru; 2020 for Brazil.

Source: OECD calculations based on OECD Economic Outlook Database.

Household gross adjusted disposable income (thousands USD per capita, 2022 or latest available)

The last available year is 2021 for Australia, Belgium, Switzerland, Germany, Spain, Estonia, Greece, Hungary, Iceland, Lithuania, Luxembourg, Latvia, Mexico, the Netherlands, Portugal, the Slovak Republic, Slovenia and the United States; 2020 for Colombia, Costa Rica, Israel, Japan, Korea and New Zealand; 2019 for Peru; 2017 for Türkiye.

Source: OECD calculations based on OECD Economic Outlook Database; Statistik Iceland; Israel Central Bureau of Statistics.

Inequality and poverty

Gini coefficient after taxes and transfers (Index of 0-100, 2021 or latest available)

The last available year is 2022 for Indonesia; 2021 for Argentina, Brazil, Colombia, Costa Rica, Finland, Latvia, the Netherlands, Norway, Sweden, the United States and Peru; 2020 for Australia, Austria, Belgium, Bulgaria, China, Croatia, Czech Republic, Estonia, Greece, Hungary, India, Ireland, Israel, Italy, Korea, Lithuania, Luxembourg, Mexico, New Zealand, Poland, Portugal, Romania, Slovenia, Spain and the United Kingdom; 2019 for Denmark,

France, Germany, Switzerland, Türkiye and the Slovak Republic; 2018 for Japan; 2017 for Chile, Iceland and South Africa.

Source: OECD Income Distribution Database and World Bank, World Development Indicators.

Poverty rate, line at 60% of median disposable income (%, 2021 or latest available)

The last available year is 2021 for Costa Rica, Finland, Latvia, the Netherlands, Norway, Sweden and the United States; 2020 for Australia, Austria, Belgium, Bulgaria, Croatia, Czech Republic, Estonia, Greece, Hungary, Ireland, Israel, Italy, Korea, Lithuania, Luxembourg, Mexico, New Zealand, Poland, Portugal, Romania, Slovenia, Spain and the United Kingdom; 2019 for Denmark, France, Germany, Switzerland, Türkiye and the Slovak Republic; 2018 for Japan; 2017 for Chile, Iceland and South Africa.

Source: OECD Income Distribution Database.

Poverty headcount ratio at $3.65 a day (%, 2021 or latest available)

The last available year is 2022 for Indonesia; 2019 for China and India.

Source: World Bank, World Development Indicators.

Environment and climate

Total greenhouse gas emissions excluding land use, land-use change and forestry per unit of GDP (2021 or latest available)

Kilograms of CO_2 equivalent per USD.

The last available year is 2019 for Israel, Korea and Mexico; 2018 for Chile and Colombia; 2017 for Costa Rica; 2016 for Brazil, India, Indonesia and Peru; 2014 for Argentina and China.

Source: OECD Environment Database.

Welfare cost of premature deaths due to exposure to ambient particulate matter (% GDP equivalent, 2019)

Source: OECD Environment Database.

Economic Policy Reforms 2023

Going for Growth

The Going for Growth report, updated biennially, looks at structural reforms in policy areas that have been identified as priorities to boost growth in OECD and selected non-OECD countries. The selection of priorities is supported by internationally comparable indicators that enable countries to assess their economic performance and structural policies in a wide range of areas. For this edition, Going for Growth advises on country-specific structural policy priorities to strengthen growth fundamentals and pave the way for successful green and digital transitions. Four key policy areas are identified: enhancing the design of social support programs; lifting potential growth by removing obstacles to effective resource utilisation; securing faster progress towards decarbonization; making the digital transformation a driver of productivity growth.

PRINT ISBN 978-92-64-62233-3
PDF ISBN 978-92-64-58372-6