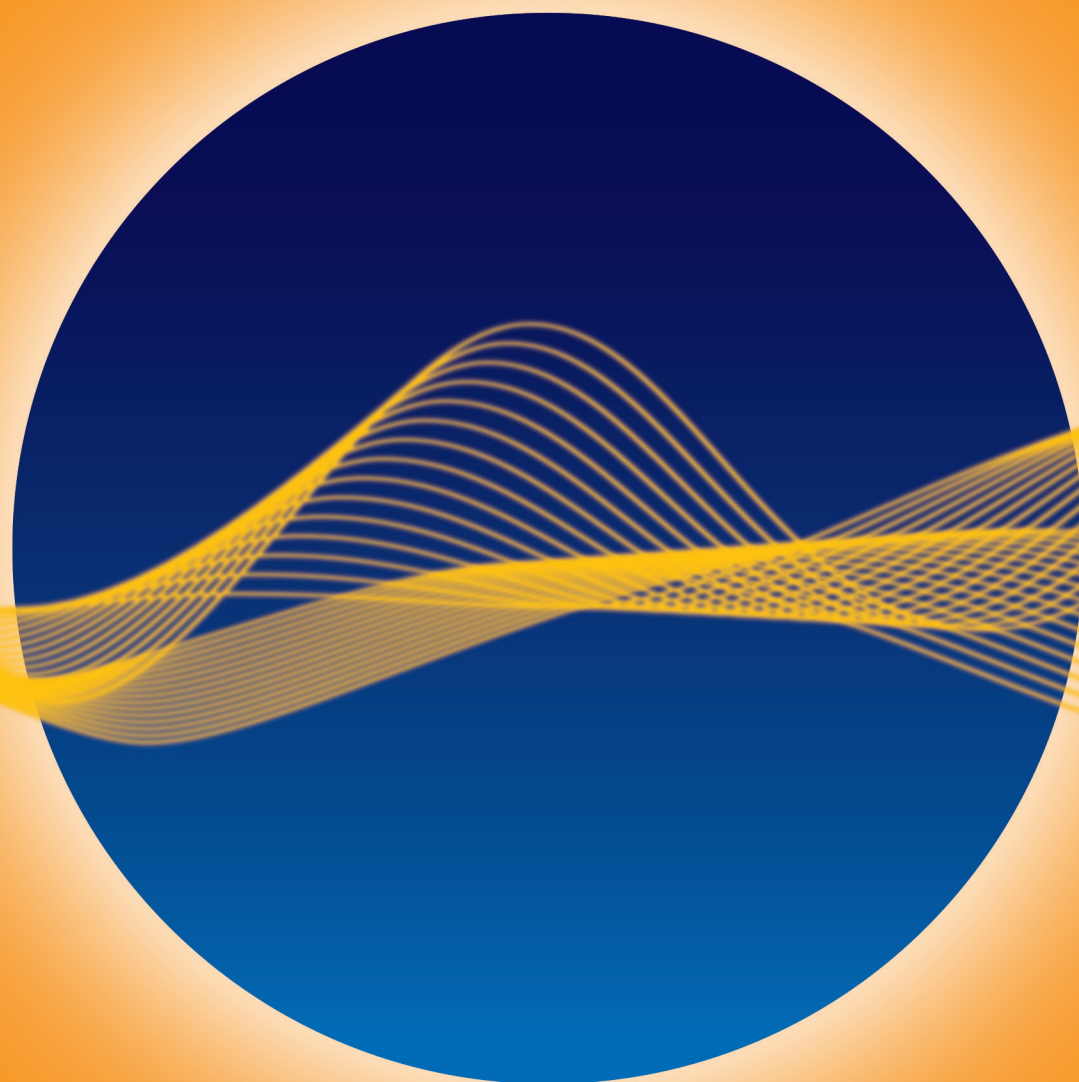


Meeting of the OECD Council at Ministerial Level

Paris, 22-23 May 2019



KEY ISSUES PAPER

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Key Issues Paper

EXECUTIVE SUMMARY

1. The digital revolution is having a profound and transformative effect on our economies and societies. Change is taking place at an increasingly fast pace with the combined fast spread of 5G technologies, the Internet of Things (IoT), cloud computing, big data analytics, Artificial Intelligence (AI), blockchain and other technologies. The potential of the transformation for enhancing individual well-being, promoting societal progress and resolving urgent problems on a global scale is clear. Digital technologies can play a key role in achieving the Sustainable Development Goals (SDGs) provided resources for large-scale investment in digital infrastructure and skills are available.

2. At the same time, the digital transformation is creating considerable challenges for policy makers, first to ensure a smooth digital transition for citizens, leaving no one behind, and second, to shape the contours of a solid and trusted digitalised economy. Policy responses need to catch up with the changes and pace of change involved in the digitalisation of economies and societies and be forward looking. Digitalisation can provide new tools for governments' policy making, but public sector capacity needs to be enhanced in this regard. Given that the digital transition transcends borders, international cooperation is also increasingly crucial in many areas including competition, taxation, data governance, inclusive growth, environment and trade.

3. The digitalisation of the economy has facilitated the emergence of new tools and business models, some of which present significant challenges for **the international tax system**. In particular, important issues have been raised relating to the allocation of taxing rights between jurisdictions (the 'nexus' rules) and on the determination of the relevant share of Multinational Enterprises' (MNEs') profits that are subject to tax in a given jurisdiction (the 'profit allocation' rules). It is critical that progress be made towards achieving a consensus-based global solution to the challenges of taxing the digital economy. The Inclusive Framework of the Base Erosion and Profit Shifting (BEPS) project will meet on May 28-29 with the aim of agreeing on a detailed roadmap on reaching a long term solution. After an update to the G20 Finance Ministers in Japan in June 2019, the Inclusive Framework is working to deliver a final report with the long term solution to the G20 by the end of 2020.

4. Despite the digital transition, **measured aggregate productivity growth over the last decade has been slower than before**, raising questions about the contribution of digital technologies to overall productivity and the adequacy of our measurement frameworks. Part of the response lies in the **competition and data governance framework**, while another part requires **policies to better empower all people and firms in the digital era**.

5. Digitalisation has helped firms innovate, improve services and expand into new markets, bringing the benefits to and creating real benefits for consumers. Nevertheless, evidence of falling business dynamism, growing industry concentration, slow technology diffusion, rising mark ups and the doubling of mergers and acquisitions (M&A) in the past decade have raised competition-related questions **in the digital era**. These may grow with the wider use of data and AI. Network effects and "scale without mass" tend to create "winner-take-most" outcomes. This may lead to long-term, durable market power. In

addition, digitalisation may bring new forms of anticompetitive conduct. For example, big data and algorithms may facilitate collusion in some circumstances. The need for further analysis does not preclude action in the short term to ensure that competition policy continues to promote competition and anti-competitive harm, accompanied by sound international tax, intellectual property and labour policies. OECD tools and analysis, such as the Competition Assessment Toolkit and the Product Market Regulation (PMR) Indicators, can help to identify barriers at entry in markets affected by the digital transition. More analysis will have to be carried out to understand how and to what extent parts of the highly digitalised economy may be intrinsically highly concentrated and possible public policies to ensure continued competition. Existing tools and competition laws will likely need to be used or adapted to continue to address competition and tackle potential anticompetitive behaviour in markets. Close coordination and cooperation between competition authorities will also need to be strengthened.

6. Trust is at the centre of many of the new business models enabled by digital technology. **Data privacy, security, the trustworthiness of online service providers and the quality of online services** have therefore become key issues in a context where trust in business has significantly declined and remains well below pre-crisis levels. Rebuilding trust is essential to fully realise the benefits of the digital revolution and represents a challenge for both business and regulators. Data have also become an important source of value, highlighting the necessity for a better understanding of different categories of data and their policy implications, their distribution and governance, as well as their different value and cross-border data flows.

7. The OECD is working extensively to advance on the measurement of data flows, on digital security and privacy, on product safety, as well as on the policy implications of further developments such as the IoT. Recognising that AI is a key enabler of the digital transition, and that trustworthiness of AI systems is key to their diffusion and the full realisation of the technology, the OECD is developing principles on Artificial Intelligence to maintain a human-centric approach to AI. This includes the definition of key technical terms, principles for responsible stewardship of trustworthy AI, guiding principles for national policies for trustworthy AI and advice for international co-operation on AI. The OECD has developed legal instruments for promoting consumer privacy and security and is in the process of updating some of them. The OECD and the broader international community should accelerate their efforts in these fields to avoid dispersed regulations that would be costly to innovation and growth and would lack full effectiveness due to the cross-border nature of digitalisation.

8. The digital transition involves deep structural changes to **labour markets, the world of work and the demand for skills**. A significant share of jobs is already at risk of automation – 14% of jobs are at high risk of automation and 32% will experience significant change over the next 10-20 years in OECD countries according to latest OECD estimates. Nevertheless, large-scale net job losses have not yet materialised. It is possible that a bigger risk may lie in growing divides as the share of jobs at high risk of automation varies between 4% and 39% in regions of the OECD. At the same time, wage inequality has been increasing due in part to increased polarisation in the labour market. Employment, skills and social policies have a key role to play in addressing these challenges and ensuring a successful transition towards a more inclusive labour market. Governments will be facing a massive training challenge, with a need to focus on adult learning, broaden coverage to under-represented groups, raise quality of provision and improve the alignment of training content with labour market needs. Education systems need to be improved to help people acquire and develop the necessary skills (critical thinking, team work, soft skills)

throughout their lives in order to harness and shape the potential of digital technology and meet changing demands. Social protection systems and investment priorities will need to be adapted to better reflect the risks affecting vulnerable segments of the population, notably low-skilled workers and those in sectors and regions that may be left behind by the digital revolution, as well as workers in non-standard forms of employment.

9. **Existing divides in terms of access to and uptake of digital technologies – along the dimensions of gender, age, countries, regions, and company sizes** – must also be addressed to avoid widening inequalities and societal divides. The gender gaps in the digital world are worrisome, as a low share of women study Information and Communication Technologies (ICT), fewer are present in managerial jobs in the sector, and 80% of the software developments are done by male-only teams. AI could also be the source of reaffirmation of current gender biases. Finally, specific policies need to facilitate adoption of key digital tools by Small and Medium Enterprises (SMEs). The OECD Jobs Strategy, the new OECD Skills Strategy, the 2019 Employment Outlook, and the OECD Framework for Policy Action on Inclusive Growth provide integrated strategies for addressing these challenges and reducing inequalities in the digital era.

10. Digital technologies can be powerful instruments for improving the management of **environmental resources** and enabling the transition towards **resource efficiency** and a **more circular economy**. For example, better monitoring combined with data analytics are helping promote more resilient, productive and sustainable forms of agriculture, increase transparency and efficiency in value chains, and facilitate the design and enforcement of environmental regulations and policies. However, digital technologies also carry environmental risks of their own, shorter replacement cycles, and the production of electronic waste and plastic pollution. The OECD has developed analysis on Big Data relevant to environmental policy making and on using technologies to improve the design and enforcement of environmental policies. Further work is needed on the potential of digital technology, as well as on the combination of environmental, socio-economic and administrative data at fine spatial scales to improve the measurement of environmental outcomes and progress, and on the design of policies.

11. Digitalisation has cut the costs of international trade and more firms, including SMEs, are exporting to new markets as online tools are facilitating cross-border sales. Although difficult to measure and without internationally-comparable statistics, the available evidence suggests that digital trade is growing. Today, digitally deliverable services, for example, represent over 20% of services trade in OECD countries. Efforts are accelerating to provide internationally comparable statistics and evidence on digital trade and data flows. The OECD's work on digital trade aims to help unpack some important policy and measurement issues raised by the digital transition. To start, the OECD and other international organisations including the World Trade Organisation (WTO) are developing a Handbook on Measuring Digital Trade. At the same time, the OECD is working on providing new frameworks for better trade policy making, identifying what matters for market openness in digital trade – including for services through the Digital Services Trade Restrictiveness Index (DSTRI) – helping inform the debate on trade and cross-data flows, including in support of the work at the WTO. Another issue in the international trade agenda today relates to levelling the international playing field, including by addressing government measures that distort international markets. The OECD has longstanding work measuring government support in agriculture, fossil fuels and fisheries and has recently expanded this work to industrial sectors, starting with the aluminium value chain. The work of the G20 Global Forum on Steel Excess Capacity, facilitated by the OECD, also represents a multilateral effort to build transparency and enhance dialogue in this complex

policy area. Market distortions are also affecting the high tech industries and digitally-intensive sectors in ways that lower their incentives or ability to innovate. More work will be needed in the future in this area.

12. Digitalisation presents an opportunity for faster development in developing and **emerging economies** but massive investment in digital infrastructure and technology is needed. The OECD Blended Finance Principles may help mobilise investment for this purpose.

13. Finally, to fully harness the digital transition's potential for enhancing well-being and promoting societal progress, proper attention needs to be given to the negative effects that digital technology may have on **work-life balance**, on **mental health** (especially that of children and young people), on **democratic processes**, and **on interpersonal and institutional trust notably through the issue of disinformation**. New norms and ethical frameworks may be required to safeguard people's well-being.

14. The OECD has spearheaded international efforts to start measuring and analysing the impact of digitalisation across all of the policy areas mentioned above. Through the production and development of comparable statistics and analysis, guidelines, tools and international standards,¹ which still requires major efforts, it will continue to lead the way in promoting a better understanding of the many facets of the digital transition. In this perspective, the OECD is undertaking a comprehensive Horizontal Project on Going Digital, with the results of the first phase published in April 2019. As a forum for international peer review and mutual learning, the OECD will also continue to facilitate the exchange of good practices and strengthen cooperation to ensure that the digital transition works to the benefit of all.

¹ The use of the term "standards" refers to its meaning within the OECD framework and not to any definition, reference or interpretation which may be used in other international organisations, including the WTO.

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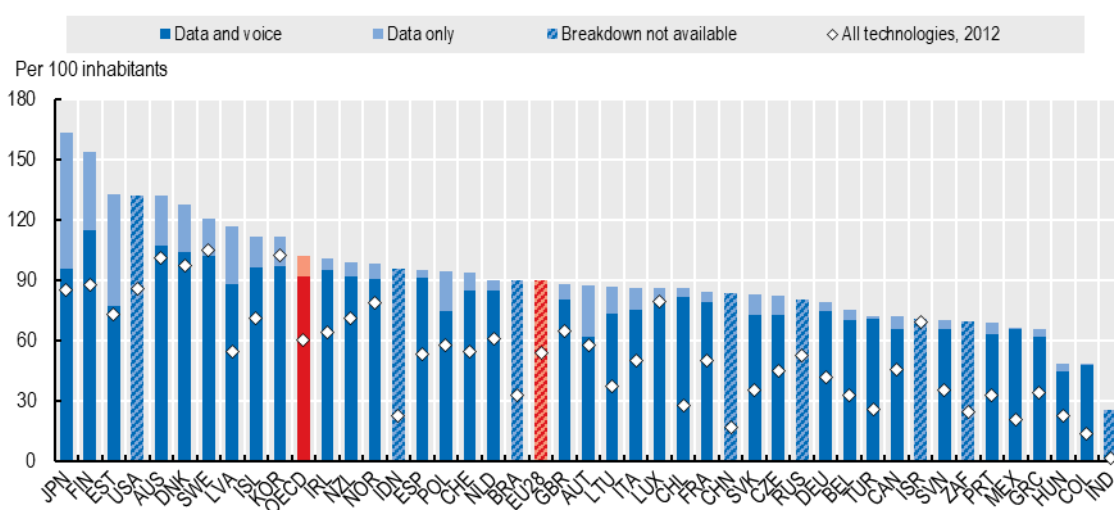
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The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the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

INTRODUCTION

15. The world is undergoing a digital revolution which is transforming different aspects of our lives at an increasing pace and in a manner so profound that it is drawing comparison to earlier industrial revolutions. Some estimates suggest that at present more data² may be produced every day than for the entire period from the beginning of civilisation up until the early 2000s (TC, n.d.^[1]). The number of mobile broadband subscriptions now exceeds the total population in the OECD area (Figure 1).

Figure 1: There are more mobile broadband subscriptions than people in the OECD
Mobile broadband subscriptions per 100 inhabitants, by package type, December 2017.



Source: (OECD, 2019^[2]) based on (OECD, n.d.^[3]); (ITU, 2018^[4]); (European Commission, n.d.^[5]) (accessed September 2018).

16. ICTs that can store, retrieve, manipulate or receive (digital) data have continuously progressed over the last sixty years (OECD, 2015^[6]; Moore, 1965^[7]). The IoT enables new business models, applications and services based on data collected from devices and objects. Next generation wireless networks such as 5G offer higher speeds, lower transfer times for data, and more flexibility, set for a future with tens of billions of devices and sensors connected to the Internet. Cloud computing provides clients with simplified access to scalable computing resources. Big data analytics are used for data mining and machine learning, offering new insights and intelligence through data, enabling data-driven innovation (DDI). AI gives machines and systems the ability to learn and adapt. Blockchain technology enables applications to authenticate ownership and carry out secure transactions. High-performance computing (HPC) makes it possible to deliver much higher processing performance than could be achieved with an ordinary computer, and is used to resolve significant problems in science, engineering and business. Quantum computing (QC) will enable the processing of information at incredibly high speeds and according to new modes, opening up the possibility of further scientific discovery and new applications. While each

² Data is defined as the representation of facts stored or transmitted as qualified or quantified symbols.

of these technologies has significant effects, their biggest potential lies in their combined use in the digital technologies ecosystem.

17. The digital transition radically affects the way that people live and work, as well as the interactions between social, economic and government actors, offering great potential for increasing well-being. It could help address some of the largest challenges of the modern era in spheres such as sustainability and the environment, development, governance, healthcare and social matters. Digital tools could also provide greater access to markets for a larger number of companies, including SMEs, with benefits for both consumers and producers.

18. At the same time, the digital transition involves many and important challenges for policy makers to ensure that digitalisation fulfils its full potential of improving well-being for all, without stifling innovation. These include issues related to competition and market access, fairness in taxation, avoiding a deepening of inequality of revenues and wealth and opportunities, as well as of access, affordability and uses of technologies, protecting privacy, consumers and children, protecting cyber security, updating intellectual property frameworks to the digital era among others. In addition, measured aggregate productivity growth over the last decade has been slower than before, raising questions about the contribution of digital technologies to overall productivity and the adequacy of our measurement frameworks to understand the impact of the digital technology on productivity growth. This slowdown could partly be an artefact due to inadequate measurement, but most attempts to look into this question suggest that much of the slowdown is real and related to the issue of diffusion and adoption.

19. The challenges for policy makers to help societies reap the benefits of the digital transition and address the difficulties involved in the transition are multiplied by the changing paradigms of the governance of policy making in the digital era, including two main factors:

- The fact that an ever more digitalised economy is also an increasingly globalised one, multiplying cross-border spill overs and effects, and increasing the gains to international cooperation. The digital transition transcends borders, and policies made in other countries directly affect all parameters of the digital transition in domestic economies. The global nature of the digital transition involves a much greater need for global cooperation and coherence of policies across countries. Outside of some areas of the European Union (EU), the vast majority of policy instruments are made to address issues within national borders, making them relatively ineffective to address challenges at the global level. For example, international collaboration on gathering earth data and its use helps to become significantly more effective in tackling environmental challenges (Group on Earth Observations, n.d.^[8]). In the same vein, much progress in international collaboration is ongoing in the tax field that will help raise the effectiveness of the tax systems in the digital era while improving the level playing field. Other examples where strengthened international collaboration is much needed relate to maintaining competition and addressing anticompetitive conduct, or the protection of data privacy when data are owned by players outside of national boundaries.³

³ In this regard, the Recommendation of the Council concerning Guidelines Governing the Protection of Privacy and Transborder Flows of Personal Data [[C\(2013\)79](#)] is being updated by the Committee on Digital Economy Policy.

- The fact that the pace of change involved in the digital transition is very fast. Traditionally, policy makers and regulation always lag behind technological changes, which can be positive in the sense that this allows innovation to take place and to be taken up across society. Nevertheless, in view of the rapidity of changes, new ways of making policies need to be found to increase the pace of the policy response to emerging challenges and opportunities (OECD, 2019^[9]). Moreover, public authorities will need to deliver faster and more coordinated answers and guidance on whether and how technological developments and new business models relate and comply with the regulatory framework. Governments can take a variety of approaches to developing adaptive and future-proof regulations that both promote innovation and mitigate risks in an impartial and proportional fashion. This can range from explicitly preventing the development of new technologies, to adopting a “wait and see” approach to discover which perceived risks materialise, performance-based policies (or so called ‘lines of the road policies’)⁴ and risk-based policies⁵ or adopting fixed-term regulatory exemptions (e.g. regulatory sandboxes) for innovative entrants that maintains overarching regulatory objectives, such as consumer protection. Policy makers can also seize the opportunity to use the disruption associated to new technologies to reform markets where regulations are unnecessarily burdensome. The greater danger of policies and international collaboration falling behind is a declining trust in policy makers and the possible emergence of extreme policy reactions that end up undermining innovation and the flow of data and technologies across countries (Anderson and Rainie, 2018^[10]).

Figure 2: Going Digital Integrated Policy Framework



Source: (OECD, n.d.^[11]).

20. The international community is undertaking major collective efforts to better understand and adjust policies in view of the digital transition. The OECD’s internationally comparable statistics and analysis, its capacity to act as a forum for international peer review and mutual learning, as well as to identify leading international practices and to establish international standards make the OECD well-placed to further inform and support

⁴ Such policies specify particular policy objectives, without specifying the means by which those objectives should be achieved, leaving actors free to innovate while remaining in the spirit of the law.

⁵ Using digital technologies to assess where risk may emerge and targeting policy action or regulatory oversight to those instances where there is a higher risk that public policy objectives will not be achieved.

policies to maximise the benefits of the digital transition and mitigate the negative effects. It is also an ideal forum for sharing and promoting common approaches with Partner countries.

21. The OECD is actively working across policy areas on analysis and measurement of changes brought about by the digital transition, and is developing guidelines, tools and international standards for the international community and domestic policy makers to effectively design appropriate policy action. It will seek to maintain its leadership on the measurement, impact and policy implications of the digital transition, drawing on its flagship Going Digital project on. Already the project's first phase (2017-2018) is delivering an integrated policy strategy for digital transition, accompanied by core indicators, to assist countries in their efforts to: 1) enhance access; 2) increase effective use; 3) unleash innovation; 4) ensure quality jobs; 5) promote social prosperity; 6) strengthen trust; and 7) foster market openness. The synthesis of the project's first phase (2017-18) – presented in the report *Going Digital: Shaping Policies, Improving Lives* – further identifies unresolved issues and elaborates a future digital agenda. This includes issues related to competition, privacy, data and cross-border flows, the future of the firm, inequalities, democracy in the information age, and trust, all issues that are at the core of this MCM. Equally, the companion report on *Measuring the Digital Transformation* sets out a roadmap with nine key actions to advance the measurement agenda to build the next generation of data and indicators needed to assess the benefits and deal with the challenges of digital transition. This Key issues paper draws heavily on the findings of these two reports, and the wealth of analysis they bring together from across the OECD.

22. As it moves to phase two during 2019-20, the Going Digital project will further develop in the near term, notably with country-specific OECD Reviews of Digital Transformation, the development of a tool-kit of tested policies and the continuation of a range of work on competition and market structure as well as well-being and social inclusion. New work will start exploring two emerging technologies likely to have a large impact on policy: AI and distributed ledger technologies like blockchain.

23. The OECD is also currently developing principles on Artificial Intelligence, based on the recognition that trust is a key enabler of the digital transition, and that trustworthiness of AI systems is key to their diffusion and the full realisation of the technology. This includes the definition of key technical terms, principles for responsible stewardship of trustworthy AI (human-centred values and fairness, transparency and explainability, robustness and accountability), guiding principles for national policies for trustworthy AI and advice for international co-operation on AI. It is also revising its 2012 Recommendation on the Protection of Children Online [[C\(2011\)155](#)] and the 2008 Recommendation on the Protection of Critical Information Infrastructures [[C\(2008\)35](#)]. These add to the existing relevant instruments, such as the Recommendation of the Council on Principles for Internet Policy Making [[C\(2011\)154](#)], the Recommendation of the Council on Digital Government Strategies [[C\(2014\)88](#)] and the Cancún Declaration on the Digital Economy: Innovation, Growth and Social Prosperity [[C\(2016\)116](#)].

24. Finally, OECD work along different policy dimensions is useful for a comprehensive approach to tackling challenges associated with digitalisation, for example the Framework for Policy Action on Inclusive Growth, the Jobs Strategy, the 2019 Employment Outlook, the 2019 Skills Outlook and the new Skills Strategy. The OECD is

also developing work on international regulatory cooperation, and with the support of the United Kingdom, a brochure on the transboundary challenges of digitalisation.⁶

⁶*Addressing the trans-border regulatory challenges of digitalisation*, to be discussed at the Regulatory Policy Committee meeting in April.

1. ITEM 5: UNLOCKING THE POTENTIAL OF DIGITAL TRANSITION: THE ROLE OF GOVERNMENTS AND IMPORTANCE OF INTERNATIONAL COOPERATION

25. In the digital era, governments will need to continue looking out for relevant actions in a wide range of areas, in particular the following:

- look out for, evaluate and address possible market failures;
- help to ensure that the public good of trust is in sufficient supply; and
- ensure free flow of data and information while defining and protecting the rights of citizens including security and privacy, and preventing breaches of the law, especially in the area of data governance.

26. It is also apparent that the digital transition is making it difficult for national governmental action to meet all these objectives without further international collaboration. OECD has begun work on good regulatory practices to harness the digital transition for sustainable development, on the trans-boundary challenges of digitalisation as well as on strengthening digital skills in the public sector, which are expected to help governments improve their regulatory and service delivery capacity as digitalisation continues to change societies.

1.1. Plenary on tax challenges arising from the digitalisation of the economy

27. The tax system is an important factor firms consider when deciding whether to invest domestically or abroad, and can distort competition and resource allocation if cross-border firms have a competitive advantage over domestic firms through international tax planning. Digital transition has a wide range of implications for taxation, impacting tax policy and tax administration at both the domestic and international levels, offering new tools and introducing new challenges for policymakers. As a result, the digitalisation of the economy has been at the centre of the recent global debate over whether current international rules governing taxation continue to be ‘fit for purpose’ in an increasingly global business environment.

28. Recent international efforts to address these issues have highlighted the divergent positions of many jurisdictions. The introduction of unilateral measures in a number of countries has underscored the urgency of the issue and the need to re-assess some of the key international tax principles. In a significant progress towards a consensus based solution, the 128 members of the Inclusive Framework agreed in January a policy note – Addressing the tax challenges arising from digitalisation – that identifies concrete proposals to explore under two pillars and which could form the basis of a global, consensus-based solution (OECD/G20 BEPS Project, 2019^[12]).

29. Under the auspices of the OECD/G20 BEPS Project and the Inclusive Framework on BEPS, work begun in 2015 recognises that digitalisation and some of the business models that it facilitates present important challenges for international taxation (OECD, 2015^[13]). This analysis acknowledges that it would be difficult, if not impossible, to ‘ring-fence’ the digital economy from the rest of the economy for tax purposes because of the increasingly pervasive nature of digitalisation. There was also recognition that digitalisation has also accelerated and changed the spread of global value chains in which MNEs integrate their worldwide operations.

30. Building on the 2015 Action 1 Report, an Interim report on the tax challenges arising from digitalisation was delivered to the G20 Finance Ministers in March 2018 (OECD, 2018^[14]). The Interim Report identified three characteristics that are frequently observed in certain highly digitalised business models: (i) scale without mass; (ii) reliance on intangible assets; and (iii) reliance on data and user contributions. Further, it was acknowledged that these characteristics are expected to become common features of an even wider number of businesses as digitalisation continues.

31. These factors raise important issues concerning the rules relating to the allocation of taxing rights between jurisdictions (the “nexus” rules) and on the determination of the relevant share of the MNEs’ profits that will be subject to tax in a given jurisdiction (the “profit allocation” rules). The existing nexus rules may be outdated as an enterprise can now be heavily involved in the economic life of a jurisdiction in circumstances where the existing tax rules only provide minimal or no taxing rights to that jurisdiction.

32. Even where an activity may create a nexus with a given jurisdiction, the rules relating to “profit allocation” (which are based on the “arm’s length” principle) may not grant to that jurisdiction a right to tax an amount of profit that accurately reflects the value created in that jurisdiction. There is a further question as to whether these challenges include risks remaining after BEPS for highly mobile income producing factors which still can be shifted into low-tax environments.

33. The Inclusive Framework will look at proposals under a first pillar based on the concepts of marketing intangibles, user contribution and significant economic presence and how they can be used to modernise the international tax system to address the tax challenges of digitalisation. A second pillar aims to resolve remaining BEPS issues and will explore two sets of interlocking rules designed to give jurisdictions a remedy in cases where income is subject to no or only very low taxation. A two pillar approach would recognise that the digitalisation of the economy is pervasive, raises broader issues, and is most evident in, but not limited to, highly digitalised businesses.

34. The Inclusive Framework will meet on 28-29 May with the aim of agreeing on a detailed roadmap on how the long-term solution would be reached, including the specific, technical work to be carried out by the OECD’s working parties. The OECD Secretary-General is scheduled to deliver an update to the G20 Finance Ministers in Fukuoka, Japan at their meeting on 8-9 June. The Inclusive Framework is working to deliver a final report with the long-term solution to the G20 by the end of 2020.

1.2. Breakout group sessions

BOG 1: Competition Aspects

35. Digitalisation has allowed new online businesses to compete with traditional offline ones, as digitally-based firms can operate without a physical presence in markets where they sell. This has brought the benefits of competition to consumers such as a larger choice of products and services, and have reduced prices and enhanced services. At the same time, there may be increased risks of competition problems in more digitalised sectors. Network effects (increased utility of a product/service with an increased number of users) and “scale without mass” (a possibility of adding new users at virtually no cost), which characterise some digitalised markets, tend to create “winner-take-all” or “winner-take-most” outcomes. If these outcomes lead to long-term, durable market power, competition and the benefits of the digital transition for growth and well-being could be at risk. The dynamism

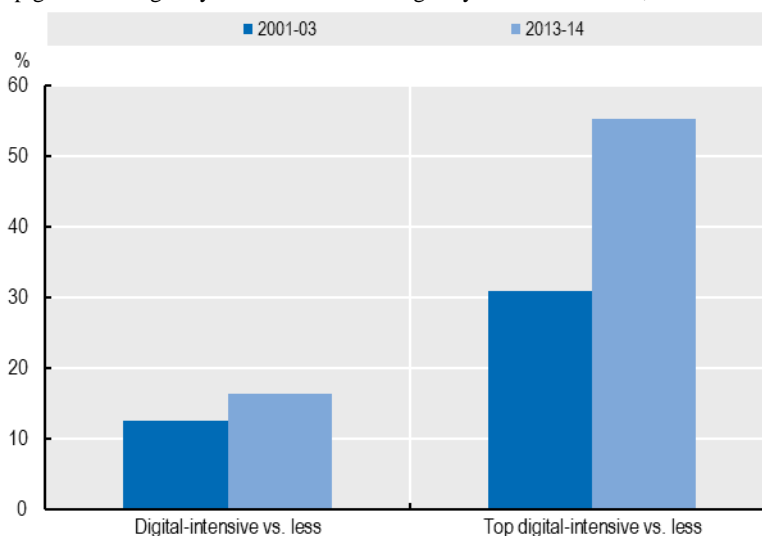
and innovation that characterise these markets, may, however, limit durable market power. In addition, digitalisation may support or facilitate new forms of anticompetitive conduct, limiting competition and generating substantial harm (OECD, 2018^[15]). For example, big data and algorithms may be used to facilitate collusion, as firms could gain an advantage by using them to enhance pricing models, sometimes even without human agency (Li and Xie, 2018^[16]; OECD, 2017^[17]).

36. The developments in AI, with data generated by those who have created and own the technologies and platforms that gather the data, may, to the extent it cannot easily be reproduced, enhance barriers to market entry leading to increased market concentration, raising competition concerns.

37. Evidence of falling business dynamism and growing industry concentration could support concerns regarding the competitive intensity of more digitalised sectors (Bajgar et al., 2019^[18]). Mark-ups, which measure the difference between the market price that a firm charges for its output and the firm's average per-unit production cost, have been increasing on average across firms and countries. The trend has been especially strong in the most digitally-intensive sectors, seeing mark-ups at up to 55% higher than those in less digitally-intensive sectors, all else equal (Calligaris, Criscuolo and Marcolin, 2018^[19]) (Figure 3). Further work needs to be done to reach more definitive conclusions.

Figure 3: Firms in digitally-intensive sectors have higher and growing mark-ups than other firms

Mark-up growth in digitally-intensive and less digitally-intensive sectors, 2011-14.



Note: The graphs report the estimates of a pooled Ordinary least Squares (OLS) regression explaining firm log-mark-ups in the period, on the basis of the company's capital intensity, age, productivity and country-year of operation, as well as a dummy variable with value 1 if the sector of operation is digital intensive vs less intensive (specifications on the left in the graph), or if the sector of operation is among the top 25% of digital intensive sectors vs not (specifications on the right in the graph). Estimates using mark-ups based on a Cobb Douglas production function. Standard errors are clustered at the company level. All coefficients are significant at the 1% confidence level.

Source: Elaboration based on (Calligaris, Criscuolo and Marcolin, 2018^[19]), based on Orbis® data (accessed July 2018).

38. The sluggishness of measured aggregate productivity growth in most OECD countries over the past decade, together with an observed widening of the dispersion of productivity between firms in given sectors, suggests that this is a question worth examining more closely.

39. In addition, the number of M&A doubled globally during 2003-2015, with the amount of cross-border acquisitions in digitally-intensive sectors growing by more than 40% in 2007-2015, and by 20% in less digitally-intensive sectors (Bajgar, Criscuolo and Timmis, forthcoming^[20]). Growing M&A activity does not, on its own, necessarily imply a weakening of competition. Indeed, acquisition may yield efficiencies of scale or scope or may enhance network effects to benefit consumers. However, there may be incidents of digital sector incumbents buying small potential competitors to prevent new disruptive technologies or business models from undercutting their profits, which should be appropriately evaluated under competition laws. Reduced competition could therefore not only allow economic rents to persist but could also potentially stymie innovation. On the other hand, acquisition may incentivise innovation by small firms which otherwise may not be able to bring innovative products or services to market on their own, but only by teaming up with a larger firm.

40. One aspect of the growing dominance of frontier firms is size. The new competition landscape also shows an increasing gap in measured multi-factor productivity growth between firms that are ICT-intensive and laggard firms that have limited capabilities or incentives to adopt new technologies (Andrews, Criscuolo and Gal, 2016^[21]). SMEs, in particular, might have a harder time to adopt productivity-enhancing technologies. For instance, on average across the EU, 33% of large firms perform big data analysis, but only 19% of medium-sized and 11% of small-sized firms do so (OECD, n.d.^[22]).

41. These trends pose challenges for competition policy makers since the available macroeconomic evidence cannot easily be linked to competition at market levels in the traditional sense of the term. It may also be that it is a combination of broader factors that creates these dynamics, including issues related to taxation, access to and consumer/citizens' ownership of data, intellectual property and labour regulation. More analysis needs to be carried out to better assess the trends identified above as well as anti-competitive behaviour. The need for further analysis does not preclude action in the short term to ensure that competition policy, tax, intellectual property and labour policy, among others, continue to promote competition, growth and well-being. In particular, competition policy will increasingly need to assess how conduct and mergers affect innovation as well as new dimensions of quality, such as consumer privacy (OECD, 2018^[23]) or the concentration of personal and non-personal data as a result of a merger. Stronger tools, such as joint investigations, are needed to enhance international cooperation between competition authorities, and their cooperation with other regulators, such as consumer protection and data protection authorities (OECD, 2018^[23]).

42. Promoting the ability of firms to compete also goes beyond competition policies and also relates to skills development and SME policy including access to finance. Ensuring that SMEs have access to data and to the infrastructure needed to store and process data is also a new policy challenge in order to promote a competitive environment.

43. In addition to conducting analysis on competition issues in the era of digitalisation, the OECD Competition Assessment Toolkit provides a method for governments to identify restraints on competition and to put in place more competition-friendly measures. The OECD is revising this Toolkit in the context of digitalisation after a call by the G-20 Digital Ministers, and will make it available in 2019 (OECD, 2018^[24]). The OECD is also currently

reviewing its PMR Indicators that help to identify regulatory impediments to market entry and competition in the economy, including at sector-specific level (OECD, 2018^[24]). The revised PMR is expected to have questions on regulation related to the digital transformation. In addition to gathering more empirical evidence, there may be a need to review some of the basic economic assumptions related to competition and rethink existing tools (for example, regarding mergers), build bridges across the different areas (tax, access to data, intellectual property rights, labour policy) and strengthen international collaboration of competition authorities.

Questions for discussion:

- how to keep markets open to new entrants, particularly in digitally intensive sectors;
- what policies could be implemented to encourage new entrants (i.e. improving ease of business, access to finance, creating ecosystems that encourage risk taking and innovations);
- what are the benefits from the market shift and how can they be harnessed to improve growth;
- how to ensure competition enforcement is well-equipped to address potential misconduct - are traditional competition tools still fit for purpose, are new policies needed or could existing competition tools be adapted;
- what are the potential impacts (positive and negative) of implementing untested policies or pursuing regulatory innovations such as regulatory sandboxes, in a rapidly changing sector;
- how to ensure that the benefits and opportunities of the digital transition are broadly distributed throughout society, and are inclusive of underrepresented groups, including women and youth;
- what role does timing play in policy implementation; and
- given the global nature of the digital economy, how can policy-makers deepen collaboration on competition issues, both internationally and domestically across government ministries.

BOG 2: Digital Security, Privacy, Trust and Consumer Protection

44. Digital transactions bring many benefits such as growth in commerce, simplified banking and new forms of social interaction. As more social and economic transactions take place digitally, and an unprecedented amount of data is shared online both willingly and unknowingly, there are mounting concerns about the security and privacy of such data for individuals and firms, about the quality of products or services offered online, and about consumer protection.

45. Privacy is not only a fundamental value that requires protection, but also a condition for the free flow of some types of data, and with it data-driven innovation, economic growth and social prosperity. More than half of privacy measures across OECD countries aim at raising awareness and empowering individuals. At the same time, individuals seek more assurance and control of the way their data is handled: they want to know if and what personal data concerning them are collected, stored, how they are used and whether they

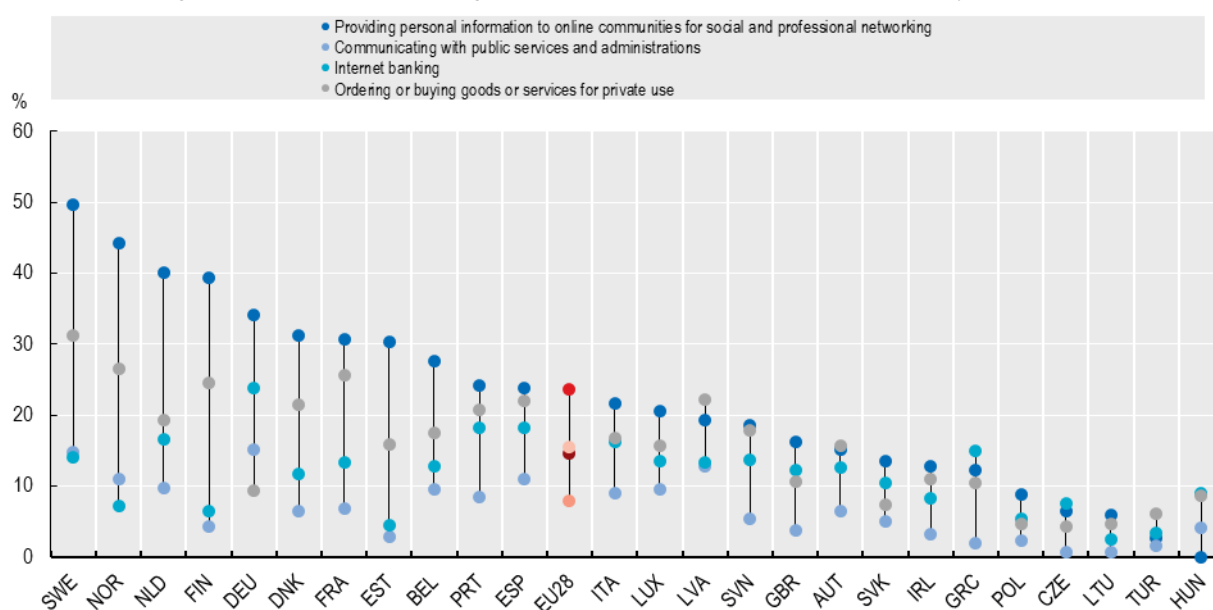
can delete or correct data or control any secondary uses. Technological advances can help increase trust through various approaches including ‘privacy by design’ processes whereby privacy implications are considered at the initial design phase of a product rather than as an afterthought. Nevertheless, there is a need for national data strategies, supported by the highest levels of government, to strike the right balance between various individuals and collective interests. Such strategies would provide clear directions to reap the social and economic benefits of enhanced reuse and sharing of data while addressing individuals’ and organisations’ concerns about the protection of privacy and personal data and intellectual property rights, as well as how to deal with mix data sets which contain personal and non-personal data.

46. New digital technologies may increase access points for security and data breaches. According to one estimate, the IoT will include up to 14.6 billion machine-to-machine (M2M) devices worldwide by 2022 (CISCO, 2017_[25]). At the same time, almost 30% of Internet users across Europe refrained from sharing personal information online due to digital security concerns in 2015, while approximately 15% of customers in the EU abstained from ordering goods or services online due to similar preoccupations (OECD, 2017_[26]) (Figure 4). Data breaches have increased in scale, and personal data is more frequently used in unforeseen ways (OECD, 2017_[26]; OECD, 2019_[27]). Approximately 3% of individuals on average in OECD countries reported having been a victim of a privacy violation over a period of three months in 2015 (OECD, 2017_[26]).

47. Recent digital security incidents have had disruptive effects and losses in sales. (OECD, 2019_[27]). The negative consequences of the misuse of data are wide-ranging and can extend to an actor’s reputation, finances, independence, safety, health, well-being, innovation or competitiveness, or lead to disruptions of vital services such as transportation or energy. They also have a longer-term social effect of hampering trust in government.

Figure 4: Security concerns deter online engagement

Percentage of (all) individuals refraining from selected online activities because of security concerns, 2015.

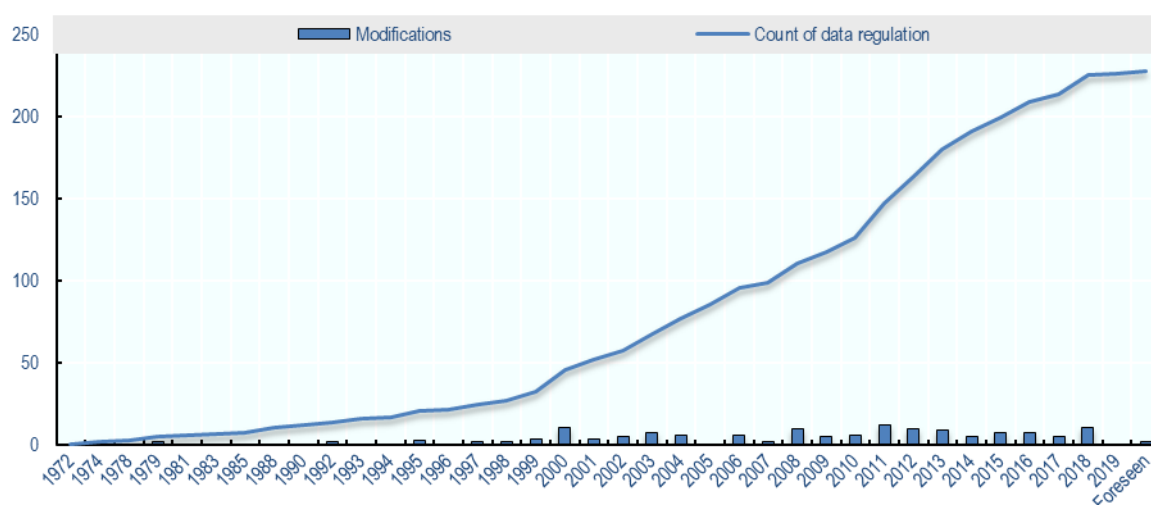


Source: OECD calculations based on (Eurostat, n.d._[28]) (accessed September 2018).

48. While online reviews can make it easier to check the trustworthiness of a service provider, online transactions can also make it more difficult to check the trustworthiness and qualifications of the service provider, the quality of the service, or the guarantees that come with it. There is a growing amount of non-compliant and unsafe products online, for instance ones that have been prohibited or recalled from the market. Important consumer information might be easy to miss. Businesses sometimes fail to disclose all components of a price upon purchase, misleading the consumer. There are also concerns in regards to information disclosure, confirmation and payment, fraud and identity theft, dispute resolution and redress. This calls for measures to protect consumer trust in the services and products bought online, and for measures to ensure consumer protection, especially because trust of individuals and firms is necessary to fully realise the potential of the digital transition.

49. Against this backdrop, regulation affecting the movement of data across borders or mandating that data be stored locally is growing (Figure 5). But international discussions are also underway with a view to ensure that that key policy objectives can be met while facilitating the movement of data across borders. There are examples of agreements at regional level aimed at protecting digital privacy and security. For instance, the Council of Europe has the Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data (Convention 108) which is also open to non-members, and the EU has the General Data Protection Regulation (GDPR) that harmonises data protection legislation in the European Economic Area countries. The Asia-Pacific Economic Co-operation Organisation (APEC) has introduced a voluntary Cross-Border Privacy Rules (CBPR) system. Trade agreements are also increasingly addressing the interaction between data flows and privacy. For instance, the United States-Mexico-Canada Agreement (USMCA) Article 19.11 constrains restrictions on cross-border data flows but recognises that limited conditions, including related to privacy, could be legitimately imposed on such flows. Additionally, Article 19.8 mandates that signatories “adopt or maintain a legal framework that provides for the protection of the personal information of the users of digital trade” (Office of the United States Trade Representative, 2018_[29]) The USMCA also recognises the APEC CBPR as a valid mechanism to facilitate cross-border information transfers while protecting personal information (further discussion of trade-related aspects is found in the session on digital trade, below). As countries consider national privacy strategies (OECD, 2017_[30]), they should try to embed interoperability with other national-level and international frameworks.

Figure 5. A growing number of cross-border data regulations
Cumulative number of data regulations.



Note: Data regulations include different types of regulation relating to data transfers and local storage requirements.

Source: (Casalini and López González, 2019^[31]).

50. The OECD is extensively working on data flows, digital security and privacy. It has several legal instruments promoting the protection of consumer privacy and security, such as the OECD Recommendation of the Council concerning Guidelines Governing the Protection of Privacy and Transborder Flows of Personal Data ([C(2013)79]- now being updated), the OECD Recommendation on Digital Security Risk Management for Economic and Social Prosperity [C(2015)115], and the OECD Recommendation on Cross-border Co-operation in the Enforcement of Laws Protecting Privacy [C(2007)67/FINAL], supported by the Global Privacy Enforcement Network. The OECD is also conducting work on product safety, the IoT and AI. The Organisation undertook a public consultation on a draft OECD Recommendation on Digital Security of Critical Activities in February 2019 (OECD, n.d.^[32]). The OECD also created an international multi-stakeholder Artificial Intelligence Group (AIGO) in July 2018 to design principles that could maintain a human-centric approach to AI that would maintain trust in this technology (OECD, 2018^[33]). The Global Forum on Digital Security and Prosperity, an international multilateral setting for discussion on public policy making on digital security, held its first meeting in December 2018 (OECD, n.d.^[34]). The Organisation has conducted an awareness campaign on the Safety of Products Sold Online (OECD, n.d.^[35]). Although very complex by nature, the OECD and the broader international community should accelerate their efforts to avoid dispersed regional or domestic regulations that would be costly to innovation and growth and would lack full effectiveness in implementation due to the cross-border nature of digitalisation.

Questions for discussion:

- how can all stakeholders work together to better balance the protection of personal information and privacy with innovation, openness, and growth;
- is consent a sufficient mechanism or should personal data protection be engrained in the design of digital products and services;

- what policies are needed to enhance consumer protection in the digital era;
- how can consumers better understand their rights and obligations, and recourse mechanisms;
- how can governments preserve the security and resilience of their critical infrastructure systems when relying on digital channels; and
- how can all stakeholders work together to better promote digital security across systems and value chains, given the complexity of digital security risks, including incentivising data-breach disclosure.

BOG 3: Data Governance

51. A data revolution is underway. Data have become an important source of value, for example for decision-making and production. Most data today are collected by machines that are equipped with great storage capacity, powered by fast processors and connected to the Internet. Key technologies that produce and use data have become ubiquitous, small and inexpensive with over a third of the global population carrying a smartphone. In turn, connected devices and smartphones in particular are central platforms for data collection and consumption, alongside the Internet of Things with its growing array of sensors and actuators embedded in devices, infrastructure and environments.

52. Data are not homogenous and need to be differentiated and can be categorised in many ways - personal data, public sector data, private sector data, proprietary data, research data, public domain data, data of public interest are not all the same data - with different policy implications. Data have value only when information is extracted, and the value depends on volume, variety, velocity, veracity, quality and fitness of use, as well as on the user.

53. In addition to the issue of privacy, data are posing other significant challenges to policy makers, all the more as the value of data is very hard to assess. Data are not equally distributed. Concentration is visible at sectoral/firm level, with some companies holding vastly more data than others. And the same companies tend to concentrate the capacity to extract the data and create value with it. Information and knowledge asymmetries may in turn affect the distribution of power, with shifts (i) away from individuals to organisations (including from consumers to businesses and from citizens to governments); (ii) from traditional businesses to data-driven businesses; and (iii) from governments to data-driven businesses; (iv) from lagging economies to data-driven ones. These shifts have effects on both economic inequality and productivity as well as on broader issues related to democracy, and need to be fully understood and discussed. It will be crucial to ensure that regulation on data gathering, storage and use is proportionate to the policy objectives, respects fundamental rights regarding privacy and data protection, and does not result in barriers to the international flows of capital, talent and ideas. Recent OECD work highlights that some digital policies, such as data localisation and data sharing requirements, would seem to constitute new digital era performance requirements and would run against the trend towards broader digital adaptation, possibly leading to digital fragmentation.

54. Effective data governance is facilitated by distinguishing between different types of data and their interactions. This allows the framing of policies that are optimal for each type of data. It is also important to master the calculation of the value of various types of data and of cross-border data flows. Of particular interest is the governance of AI which, to achieve its potential social benefits, needs transparency in the development and use of

algorithms, to avoid possible biases and errors that may be highly damageable to societies and individuals (OECD, 2018_[36]).

55. The OECD is in the process of conducting extensive work on the measurement of data including cross-border. It is conducting work on trust in business and in AI, including through a newly established Observatory of AI. Further international collaboration is urgently needed to better understand and measure data flows including across borders, analyse the value of these data and address the potential effects of the concentration of data on competition, productivity and inequality.

56. Since 2010, the OECD has been exploring ways in which personal health data can be put to work in the public interest, for example improving healthcare quality and outcomes, health system management, public health and research. This work culminated in the OECD Council Recommendation on Health Data Governance [[C\(2016\)176](#)] in late 2016.

57. Building on the framework set out by the Recommendation, the OECD is also exploring how countries are deploying available health data to generate knowledge that can achieve their policy objectives. This topic will be the subject of an OECD Policy Forum on 29 November 2019 in Copenhagen, Denmark.

Questions for discussion:

- how can policy-makers better support the development of measures of the value of data and cross-border data flows, including in relation to intellectual property rights;
- what policies should be applied to different types of data;
- how can policy-makers develop national data strategies that unleash the potential of data including their use and availability to a wide range of actors without sacrificing security and privacy and promoting trust;
- what type(s) of international data governance could be developed;
- how can policymakers harness the benefits of competition in order to ensure that consumers are given meaningful opportunities to exercise choices regarding how their data is used, including the possibility for greater ownership over their own data;
- how to foster the transparency of algorithms for AI and approach the use and design of AI so that it is human-centric;
- what types of safeguards will be needed to ensure privacy, security, as well as the ethical use of data – and, how can policy-makers ensure that any regulation of data does not create unnecessary barriers, reduce competition, innovation, and/or generally undermine the digital transition’s promise for growth and well-being.

2. ITEM 6: EMPOWERING DIFFERENT ACTORS IN SOCIETY IN THE DIGITAL AGE: THE ROLE OF JOBS, SKILLS, AND EDUCATION

BOG: Empowering Different Actors in Society in the Digital Age

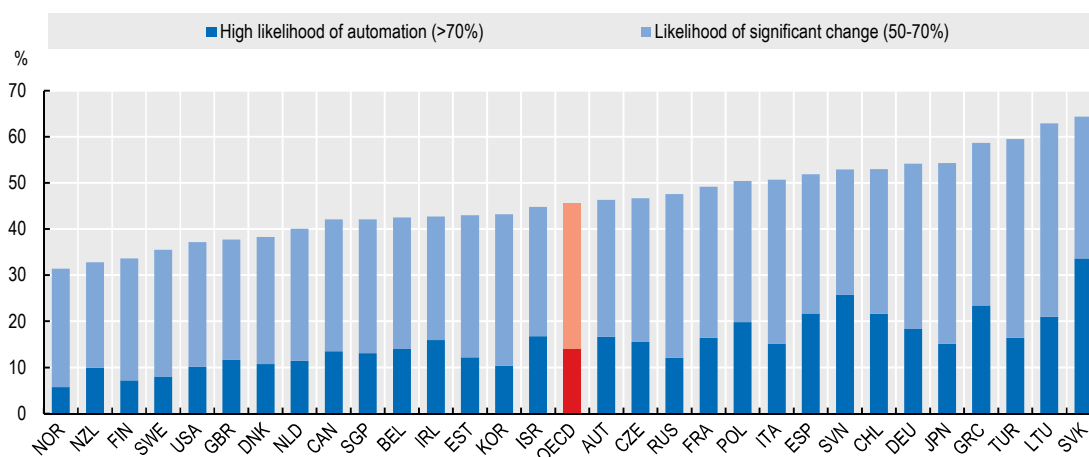
58. Together with globalisation, population ageing and climate change, digitalisation is changing the labour markets. As it creates new activities and displaces others, it is imperative to promote successful transitions from declining to expanding sectors. This creates a challenge for policy makers to strike the right balance between flexibility and mobility on the one hand, and job stability on the other. Available evidence also shows growing wage inequality in many OECD economies, some of which may be a result of digitalisation. There is evidence of skill-biased technological change, which results in rising relative wages for highly skilled workers, as well as a rising dispersion of wage rates across firms within given sectors, which may at least in part reflect differing rates of adoption of digital technology.

59. Without the right policy response to these changes, the digital transition will leave many behind and undermine social cohesion. It will be necessary to empower people by equipping them with the right mix of skills to succeed in a digital world of work, making adult learning systems more responsive to changing skill needs and inclusive, including extension of apprenticeship and work-based training models, addressing concerns around emerging forms of work, including by getting the classification of workers right and strengthening social protection to ensure better coverage of workers in non-standard forms of employment who are at greater risk of being left behind. This means education and training systems that are adequately prepared for the massive challenges ahead, as well as improved social protection systems. Timely and effective employment services that ensure smooth job transitions as well as adequate job search and income support will be important to ease the transition of workers displaced by digitalisation into new jobs. Effective social dialogue and collective bargaining systems can complement government efforts to strengthen labour market adaptability.

2.1. The expected effect of digitalisation on labour markets

60. Fears of massive technological unemployment are widespread. Across 19 OECD countries surveyed in 2018, over 40% of employed respondents identified losing their job or self-employment income as one of the top three risks facing them or their families over the coming two years (OECD, 2019^[37]). Some studies have raised the fear of massive technological unemployment, with up to half of existing jobs at risk of being destroyed due to automation (West, 2018^[38]; Frey and Osborne, 2017^[39]; Bruegel, 2014^[40]; McKinsey Global Institute, 2017^[41]). Recent OECD work, which uses a finer-grained approach based on the task-content of jobs, estimates that approximately 14% of jobs are at high risk of full automation on average in the OECD countries. However, another 32% of jobs are at a risk of significant change in the next 10-20 years (OECD, 2019^[42]) (Figure 6). Significant uncertainty surrounds these estimates, and some other studies suggest still higher numbers, but even with OECD's lower estimates nearly half of the labour will experience a significant impact of automation, also with very significant variations within countries across regions. The share of jobs at high risk of automation in regions within countries ranges from 4% to 39% across the OECD (OECD, 2018^[43]). This suggests that rather than massive technological unemployment we may be facing growing divides in the labour market and certainly greater needs to train and re-train many workers.

Figure 6: A significant share of jobs could be affected by automation
Likelihood of automation or significant change to jobs, as a percentage of all jobs, 2012 or 2015.



Source: (Nedelkoska and Quintini, 2018_[44]).

61. The argument about technological unemployment is not new and has been associated with major changes in the industrial structure in the past. At present however, the evidence suggests that large-scale net job losses have not materialised. In fact, employment rates have reached an unprecedentedly high level in many OECD countries. Furthermore, technology has been a significant source of jobs with four out of ten jobs created in the past decade being in digitally-intensive sectors. In the whole OECD area, these sectors contributed 16 million jobs in 2006-2016. It is important to remember that, contrary to the lump of labour fallacy, the quantity of work is not fixed and more tasks performed by robots does not automatically mean that there will be less work available for humans. The more realistic challenge for policy-makers to address in the future will likely be not an absence of jobs, but ensuring that the jobs created are of sufficient quality, that education systems (determining the supply of skilled labour) can keep up with technological change (driving increases in the demand for skilled labour) in the so-called “Tinbergen race” and that digitalisation does not lead to increased inequality. Furthermore, job displacement will likely be concentrated in particular occupations and territories.

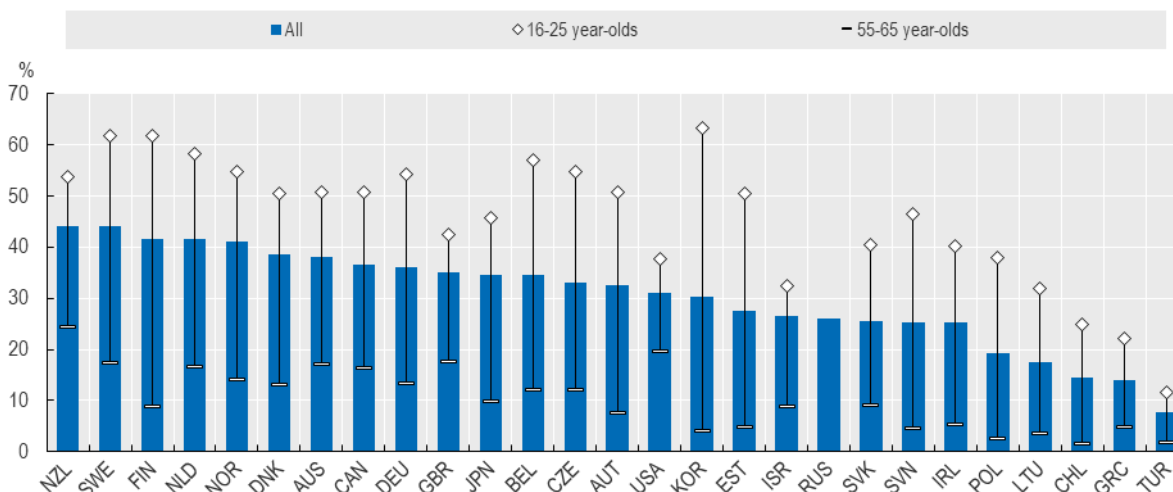
62. The available evidence gives more cause for concern on these scores. In many OECD countries, real median wages have stagnated or worse for long periods, leading to increases in wage inequality. These trends reflect a decoupling between real median wage growth and average labour productivity growth observed across much of the OECD over the past two decades. This decoupling points to the fact that improvements in productivity generated by digitalisation will not automatically translate into wage increases for all workers (Schwellnus et al., 2018_[45]). Accordingly, wage gains have tended to be weakest for the low-skilled, and in-work poverty rates have risen. In addition, non-standard work arrangements, including remote employment or platform mediated work such as “crowd work” or “gig-work”, have become increasingly common, although their share of employment is still very small (OECD, 2019_[42]). The majority of individuals taking up such jobs are independent, self-employed or are working part time. It will be important to ensure that existing employment regulations are up-to-date and fully enforced, and that differences in tax and regulatory treatments across employment forms do not create

competitive advantage across firms based on different regulatory regimes or encourage the misclassification of workers. Moreover, it will become crucial to make sure that independent work carried out within this context is actual independent work, and not disguised subordinate work.

63. The digital transition is placing new demands on education and training to ensure a good match between the supply of and the demand for skills, as well as the effective adoption of new technology. There is a larger need for both cognitive skills such as written and oral expression, numeracy, reasoning and complex problem solving; as well as more specific ICT skills such as basic computer skills, communication and information search skills, proficiency in using office productivity software (Grundke et al., 2018^[46]; OECD, 2017^[47]; OECD, 2019^[42]; OECD, forthcoming^[48]). (see evidence from the OECD Skills for Jobs database www.oecdskillsforjobsdatabase.org). Transversal skills including critical and creative thinking, problem-solving and team-working are also gaining importance, as are emotional intelligence and the ability for continued learning. Demand for routine skills and physical abilities has been shrinking. High-level skills are becoming more sought after than mid-level skills, as the share of high-skilled jobs has risen rising in most countries over the last two decades, while the share of middle-skilled jobs has fallen. Despite this, many people lack appropriate qualifications to respond to the changing structure of labour and skills demand. Furthermore, evidence from Programme for the International Assessment of Adult Competencies (PIAAC) shows that there are large gaps in ICT literacy in all OECD countries with only 31% of adults having adequate problem-solving capabilities for technology-rich environments (OECD, 2017^[49]) (Figure 7).

Figure 7: Proficiency in problem solving in technology-rich environments, by age, 2012 or 2015

Percentage of 16-65 year-olds scoring at levels 2 and 3 in each age group.



Source: OECD calculations based on Survey of Adult Skills (PIAAC) Database, September 2018.

64. Overall, education and training systems will need to become more flexible in light of the profound transformations that have already begun to affect the labour market and that are bound to continue to do so. Continuous education throughout people's lives, upskilling and re-skilling initiatives through both formal and non-formal methods are key to ensuring that people's skills remain relevant. Vocational training and apprenticeship in adult learning will be important in continuous training. The scope of subjects requiring

formal training might need to expand, while appropriate mechanisms for recognising non formal learning should be available.

65. Adult learning should be prioritised as much as that of young people, in view of the possibility of needing to change jobs and learn new skills. Low-skilled jobs face the largest risk of automation, yet lower-skilled workers are the least likely to receive training. Participation in adult learning of those with poorer skills is 23% lower than for those with medium and higher skills (OECD, 2019_[50]).

66. Finally, unemployed workers and those at risk of involuntary unemployment would benefit from more training, as the current average spending on the training of such workers is only 0.13% of GDP across the OECD (OECD, 2019_[27]).

67. These changes will require appropriate investments to scale up adult learning systems, broaden access to learning systems for all, and especially to under-represented groups, raise the quality of provision and improve the alignment of training content with labour market needs. These improvements call for a ‘healthy mix’ of co-financing by government, employers and individuals in line with ability to pay and the benefits obtained (OECD, 2019_[50]).

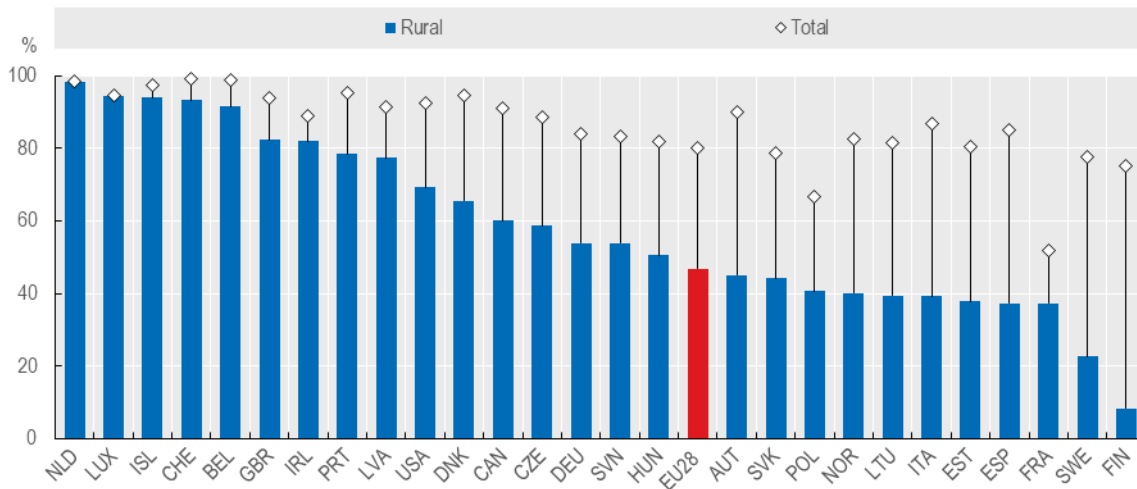
2.2. Disparities in access to and uptake of digital technologies

68. Disparities in access to and uptake of digital technologies as well as gaps in digital skills exist along dimensions such as gender, age, countries and regions, and company sizes. Across the OECD, slightly fewer women than men use the Internet, and the gap is very significant in some countries, reaching up to 16% in Turkey (OECD/G20, 2018_[51]). More than twice as many young men (16-24 years old) are trained for programming than women. Women are also less likely to study science, technology, engineering and mathematics (STEM) subjects, and far fewer women pursue professions in these fields (OECD/G20, 2018_[51]). For instance, in OECD countries, fewer than one in three engineering graduates and fewer than one in five computer science graduates are girls (OECD Gender Equality Data, n.d._[52]).

69. Older individuals tend to have poorer ICT skills and are less likely to use the Internet. For example, on average 32% of 55-65 year-olds do not have computer experience or have failed core ICT tests, compared to 5% of 16-24 year-olds (OECD, 2017_[53]). People aged 55-74 are less likely than those aged 16-24 to use the Internet in every OECD country for which data were available in 2016 (OECD, 2019_[54]).

70. Performance in reading and mathematics varies substantially across countries, and the usage rates of online banking fluctuate significantly, with a gap of over 80% between the country with the highest and that with the lowest usage rate. Rural areas in all OECD countries still have less access than urban areas to fixed broadband of sufficient quality (a minimum download speed of 30 megabits per second, required to use advanced connected devices and services), despite the gap narrowing since 2010 in almost all of them and even reversing in the case of Luxembourg (Figure 8). The new geography of job creation may present additional risks in terms of urban-rural divides as new jobs appear in areas other than those where jobs were lost. This has notably been the case in the United States, where most new jobs have been created in urban areas with high-skilled workers (Berger and Frey, 2015_[55]).

Figure 8: Rural areas lag behind other areas in terms of broadband access at reasonable speeds
Percentage of households covered with fixed broadband access with a minimum speed of 30 Mbps, 2016.



Source: OECD calculations based on (Canadian Radio-Television and Telecommunications Commission, 2017^[56]); (European Commission, 2018^[57]); (Federal Communications Commission, 2018^[58]).

71. Finally, important differences exist for all digital tools among firm sizes. Digital technologies offer a number of opportunities for SMEs to better integrate their operations, reduce costs and expand into new markets. However, digital diffusion tends to slowdown as technologies become more sophisticated and firms get smaller. While most firms now have access to high-speed broadband networks, more advanced, productivity-enhancing digital tools and applications have diffused to far fewer firms in OECD countries. For example, 77% of large firms use Enterprise Resource Planning (ERP) systems, but only 27% of small-sized firms do so. Also, while cloud computing is a pivotal asset for SME digital transition, cloud computing services are used by only 26% of small firms, against 38% of medium-size firms and 52% of large firms (OECD, forthcoming^[59]).

72. To help SMEs overcome barriers to the use of advanced digital tools, governments can create favourable conditions for ICT adoption, such as policies that foster ICT investment, skills development and business dynamism. Governments can also address specific challenges faced by SMEs through more targeted policies such as support schemes to facilitate the adoption of key digital tools, like cloud computing, measures to better exploit and protect intellectual property and leverage other tangibles, exemptions of certain rules to facilitate compliance (for example, the EU GDPR includes an exemption for organisations with fewer than 250 employees with regard to record keeping), programmes that create opportunities for partnerships between SMEs, larger firms, public institutions and other stakeholders, programmes for capacity building and digital skills training, and measures that enhance data management practices and digital risk management by SMEs.

2.3. Adapting social protection systems and investment priorities for the future of work

73. Social protection systems and investment priorities will need to adapt in order to take into account the risk of automation, evolving skills requirements and increased polarisation of labour markets. For example, measures may be needed to support low-wage

workers who have been experiencing downward pressure on their incomes, while active labour market policies and income support schemes can help encourage a smooth transition back to work for displaced workers. Social policies can ensure that rights and protection are increasingly attached to individuals, and not to specific jobs, and can promote greater geographic mobility for lower-skilled workers notably through affordable quality housing. In some settings, redistribution policies and in-kind transfers might have to be strengthened to help disadvantaged segments of the population. Appropriate investments in skills will also be necessary to make the most of the digital transition and prevent at-risk social groups from falling behind. Revitalisation of rural territories should also be considered in order to reinforce national cohesion and to take into account family and personal ties.

74. Access to social protection is a challenge for workers in non-standard employment. The self-employed are usually less well-covered by statutory social protection provisions. Workers in other forms of non-standard employment sometimes appear to be covered by these provisions but in reality often struggle to gain access in practice because they fail to meet minimum contribution periods and/or earnings thresholds (OECD, 2019^[42]).

75. Social protection provisions should ensure coverage of workers in non-standard forms of employment. Potential policy options include boosting the portability of entitlements; making means-tests more responsive to people's needs; and complementing targeted social protection measures with more universal and unconditional support.

76. The OECD Policy Framework for Inclusive Growth has provided a general framework for policy action to address growing inequalities. The OECD is also supporting policy measures in these fields through the new OECD Skills Strategy, the OECD Bridging the Gender Digital Divide report, the PISA Global Competence Framework, the Global Deal Flagship Report, the new OECD Jobs Strategy, the Getting Skills Right: Future-Ready Adult Learning report, the Employment Outlook 2019 report dedicated to the future of work, the OECD report on Online Platforms: A Practical Approach to their Economic and Social Impacts. The forthcoming SME and Entrepreneurship Outlook as well as Job Creation and Local Development and the recently published OECD Regional Outlook all highlight the need for policy to consider the distributional impacts of digitalisation trends, and for more data to underpin policies that seek to address the opportunities and divides for people and firms in different types of places. Further work is also needed on adapting life-learning systems to changing skills needs, and to assist countries in preparing for these challenges through Future of Work with peer reviews. Following the meeting of Social Policy Ministers in May 2018, the OECD launched a Call for Innovation to identify best practices in stakeholder engagement and will organise a conference on Social Data for Tomorrow to explore how best to use existing information for people-centred social policy, and how to identify new sources and new collection methods for social data. Work is also underway to prepare for the second round of the Risks that Matter Survey.

Questions for discussion:

- how policy may best address the inequalities related to the changing nature of work and adaptation of emerging technologies such as AI;
- what policy options may facilitate skills formation, adaptation and training needed for success in the digital workplace;
- what measures can be taken to address various digital divides, including the digital gender divide;

- how should governments move forward on adapting social protection to non-standard forms of work and more generally to support the future of work;
- what is the impact of digitalisation on skills demand;
- what type of education and training investments are needed to upgrade the skills of people migrating from low-digital to high-digital jobs;
- how can governments create favourable conditions for ICT adoption by SMEs, such as policies that foster ICT investment, skills development and business dynamism;
- what approaches may facilitate the access of firms and entrepreneurs in lagging regions to existing knowledge and technology;
- how can governments help to ensure that SMEs become not only technology takers, but also technology shapers, participating more in the innovation activities and the development of the new technologies;
- what are the options to promote access to high quality broadband in remote areas.

3. ITEM 9: REALISING THE DIGITAL PROMISE FOR SUSTAINABILITY AND WELL-BEING

BOG 1: Digital Innovation for the Achievement of the SDGs

77. Digital innovation can support the full spectrum of SDGs through new technologies and tools in a variety of sectors, including education, health, finance, transportation, energy, agriculture, manufacturing, and infrastructure. Big data and deep learning can help to improve the accuracy of climate change projections, improve the efficiency and productivity of agricultural production, forecast and track air pollution, simulate zoning laws and devise flood plains to assist with disaster preparedness. Moreover, access to information, communication technology, and universal/affordable access to the Internet is one of the targets of SDG nine on building resilient infrastructure, promoting inclusive and sustainable industrialisation and fostering innovation. The quality of public administration could also potentially improve through digitalisation.

78. Key obstacles to making the most of digital technologies in support of SDGs in developing countries include limited digital infrastructure and gaps in skills, particularly affecting women and girls (OECD/G20, 2018_[51]). In this respect, quality infrastructure with open and fair access is key. In addition to shortfalls in Internet connections, there are also often large gaps in access to high-speed Internet (Shenglin et al., 2017_[60]). In Africa, for example, significant investment is needed to upgrade backhaul infrastructure (more than two-thirds of mobile connections are 2G, while 4G connections represent only 2% of the market) (Connecting Africa, 2017_[61]) and to design regulatory frameworks that incorporate good practices and are appropriate to local contexts (AUC/OECD, 2018_[62]). Moreover, developing countries generally lag behind on digital literacy, preventing them from taking full advantage of the digital transition (Shenglin et al., 2017_[60]). As the digital economy transforms the demand of skills, developing countries can particularly suffer, as their skills levels are usually low and digital skills are particularly scarce. For example, in Latin America 70% of formal firms declared that they need workers with a certain degree of digital/technological skills (OECD and Manpower, forthcoming_[63]), and only one out of five university students graduated from STEM subjects (OECD/CAF/UN ECLAC, 2016_[64]).

79. Donors are helping to bridge the digital divide by providing developing countries with technical support and risk-mitigation mechanisms to crowd-in private funds. The 2017 OECD–WTO aid for trade monitoring exercise found that ICT is prioritised in the development strategy of two-thirds of the donors, while nearly all developing countries (90%) anticipate a need for future assistance in this area (OECD/WTO, 2017_[65]).

80. International co-operation is crucial for innovation stakeholders to collaborate, share costs and capacities, and benefit from spill-overs in technology (Shenglin et al., 2017_[60]). However, such co-operation is currently lacking. According to recent OECD analysis, research projects relating to SDGs represent only about 11% of the total number of projects funded in 2015. Moreover, international co-operation occurs in about 2% of these, i.e. international co-operation for SDGs represents only about 0.2% of all projects in the field of science, technology and innovation (STI) (OECD, 2017_[66]).

81. There is, moreover, a need for large-scale and longer-term funding for digital infrastructure from public and private sources. Although competition has facilitated private investment in many developing countries, there are still many cases where state-owned incumbents enjoy undue advantages and where regulatory institutions are too weak and/or

captured by business interests. In regards to research, interdisciplinary or transdisciplinary research such as sustainability science might need to be encouraged to help identify complementarities between SDGs and constraining factors on achieving SDGs.

82. In 2016, private sector Research and Development (R&D) represented almost three-quarters of all R&D expenditure in the OECD countries, and overall amounted to about 1.6% of GDP (OECD, 2019_[27]). Yet public funding for SDG-related research is important, as the private sector might be less willing to invest in projects with high costs and uncertain results. As an example, some of the earliest digital technologies including the Internet, the global positioning system (GPS) and voice recognition technology, have their origin in publicly funded research and development (OECD, 2016_[67]). This has declined, however. In 2017, government spending on research and development in the OECD was 8% below the 2009 levels in real terms (OECD, 2018_[68]). Public-private partnerships (PPPs) are also important as they can split the risks and rewards. Moreover, few individual companies, especially SMEs, have sufficient resources and mission-oriented innovation projects to advance cutting-edge knowledge without public support.

83. The OECD Development Assistance Committee (DAC) Blended Finance Principles for Unlocking Commercial Finance for the SDGs are a policy tool for all providers of development finance including donor governments, development co-operation agencies and philanthropies, as well as other relevant stakeholders (OECD, n.d._[69]). Blended finance instruments helped mobilise USD 152.1 billion of private sector finance from 2012–17. During this period, 42% of the funds mobilised were through guarantees (OECD, 2019_[70]). The OECD is currently developing detailed guidance for the implementation of the Principles, including best practice examples (OECD, n.d._[69]).

Questions for discussion:

- how to promote knowledge sharing among countries on digital and production transformation strategies and public-private partnerships for research, funding and implementation aimed at harnessing the digital transition for the achievement of the SDGs.

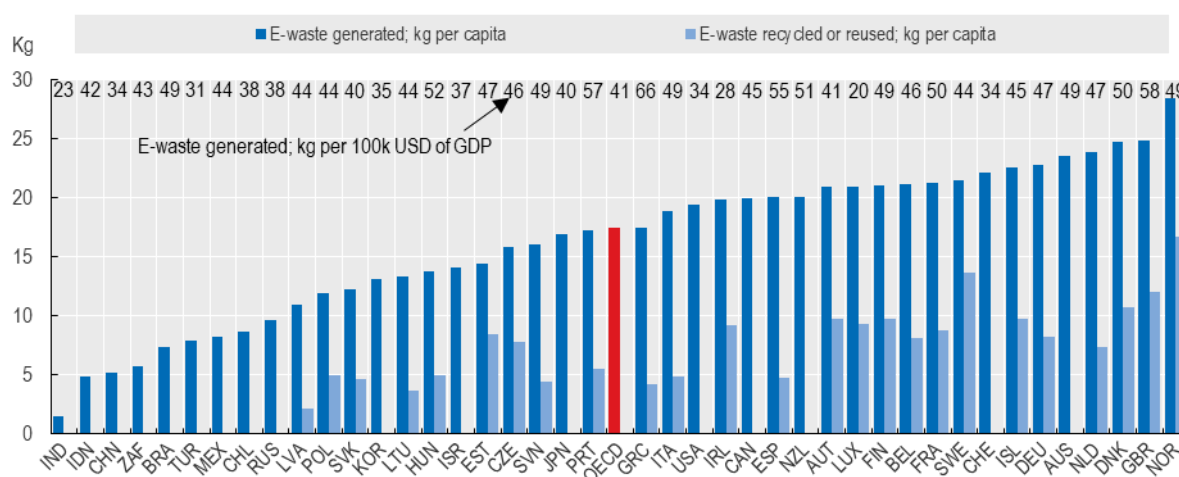
BOG 2: Digital Innovation as a Catalyst for Circular Economy and Green Growth

84. Digital technologies hold promise for enhanced environmental management and protection and improved environment policy design. For example, digital solutions can promote the circular economy by helping drive efficiencies in supply chains or by tracking hazardous chemicals in products. Digital technologies can reduce energy consumption through smarter management on the demand side, optimised delivery and by supporting new business and consumption models. The application of digital solutions to logistics, for example, has the potential to reduce road freight energy use by 20-25% (IEA, 2017_[71]). Digital technologies also hold great potential for measuring environmental change and monitoring and enforcing regulations, to help ensure effectiveness of environmental policies (OECD, 2019_[9]).

85. Yet new technologies might also generate additional environmental challenges. For instance, the fact that they enable more cross-border purchases could increase environmental fall-out and impact the effectiveness of domestic recycling and waste-management policies, such as policies on extended producer responsibility (De Backer and Flaig, 2017_[72]); (Hilton et al., 2019_[73]). Opportunities exist to encourage the reuse, recycling and refurbishment of used electronic equipment and should be further

encouraged. The energy and resources used for the production and application of ICT technologies could potentially increase, especially as replacement cycles for such technologies have been getting shorter. Some technologies, such as bitcoin mining, place a high demand on electricity. Importantly, the amount of electronic waste (e-waste) such as used mobile phones’ nano-particles and plastics has been going up since 2014 (Balde et al., 2017^[74]) (Figure 9).

Figure 9: E-waste generation and recycling or reuse, 2016
Kilogrammes per capita and per 100 000 USD of GDP.



Source: OECD based on OECD calculations based on (Balde et al., 2017^[74]), (Eurostat, n.d.^[75]), and (OECD, n.d.^[76]) (accessed December 2018).

86. Digitalisation is also promising to substantially change the way we grow and distribute food, fibre and fuel, with the promise of achieving more resilient, productive and sustainable agriculture and food systems and may also help respond to new consumer concerns about how food is produced by enabling comprehensive farm-to-fork traceability. Digitalisation can help manage the environmental footprint of agriculture – for example, as satellite data is used to monitor crop growth, land quality, water resources, or other environmental outcomes. Input use can be reduced by combining sensors, automated farm machinery and advanced analytics software to fine-tune and automate agricultural production. Innovative data management systems can improve the efficiency and transparency of agri-food value chains, incentivising the adoption of sustainable practices.

87. Building on its work on green growth, the OECD has developed analysis on Big Data relevant to environmental policy making, and on using digital technologies to improve the design and enforcement of environmental policies. Further work is needed to explore the potential of digitalisation to facilitate the transition to a more circular economy, as well as on combining environmental, socio-economic and administrative data at fine spatial scales to allow for better measurement of progress towards an environmentally sustainable and inclusive economy, and to support policies that promote equitable sharing of benefits from environmental improvements. Combining data at spatial scales will also help strengthen the implementation of the System for Environmental-Economic Accounting (SEEA) to link environmental and economic statistics at the industry and country levels.

Specific open data policies with a strong focus in agriculture and environmental resources may help in the development of digital solutions for a more sustainable and green economy.

Questions for discussion:

- the potential of digital technologies to increase resource efficiency, support the transition to a more circular economy and achieve green growth by delivering resilient, productive and sustainable systems, for example across the plastics value chain or for agrifood systems;
- how to improve understanding of how this potential can be best leveraged by governments, including by integrating and deploying ‘big data’ (including from earth observation) that can improve the analysis, traceability and foresight of material flows and protect against exogenous shocks; and
- how digital technologies can better support decision-making in response to global environmental challenges, climate change and extreme weather events, thereby helping to protect the environment, oceans and the communities that depend on them.

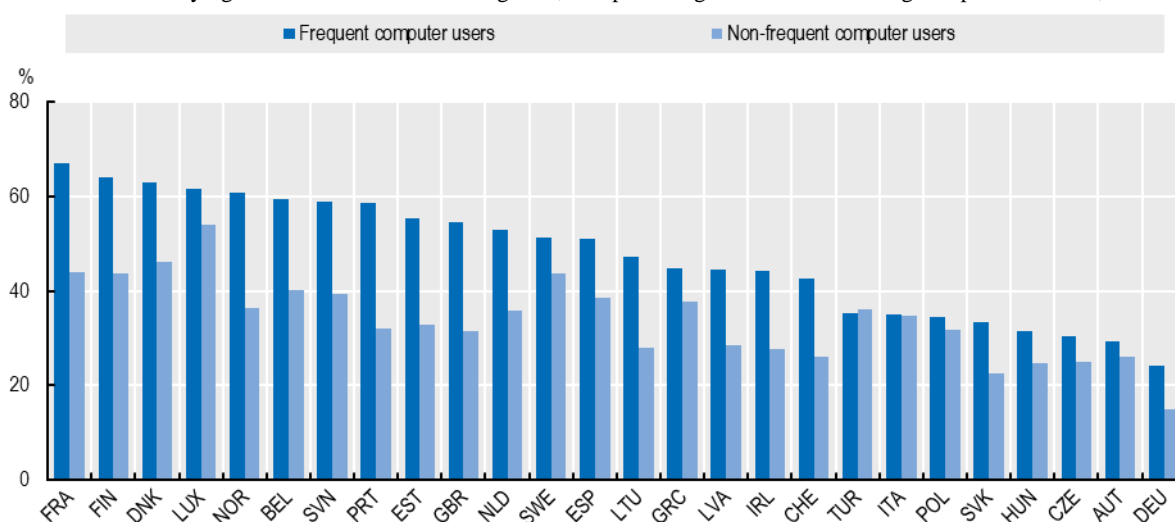
BOG 3: Digital Innovation as an Engine of Smart Solutions for Better Lives

88. Digital innovation holds promise for people’s well-being, such as improving access to information, healthcare and education. Yet it might also pose challenges to work-life balance, mental health, inclusiveness, security, democratic processes, trust in others and in institutions.

89. One way in which digital technologies could boost workers’ well-being is by providing more flexible working opportunities such as teleworking. This could also make a positive contribution to the diversity and inclusiveness of workplaces. At the same time, such changes could have a negative impact on work-life balance and mental well-being of employees. There is evidence that workers who use a computer often are 8% more likely to worry about work during their free time than those who do not use a computer (OECD, 2019^[27]) (Figure 10). According to one US study, time spent on e-mails and the expectation for people to check their e-mails after working hours lessen job satisfaction (Belkin, Becker and Conroy, 2016^[77]).

Figure 10: Computers and work-stress go hand-in-hand

Individuals worrying about work outside working time, as a percentage of individuals using computers at work, 2015.

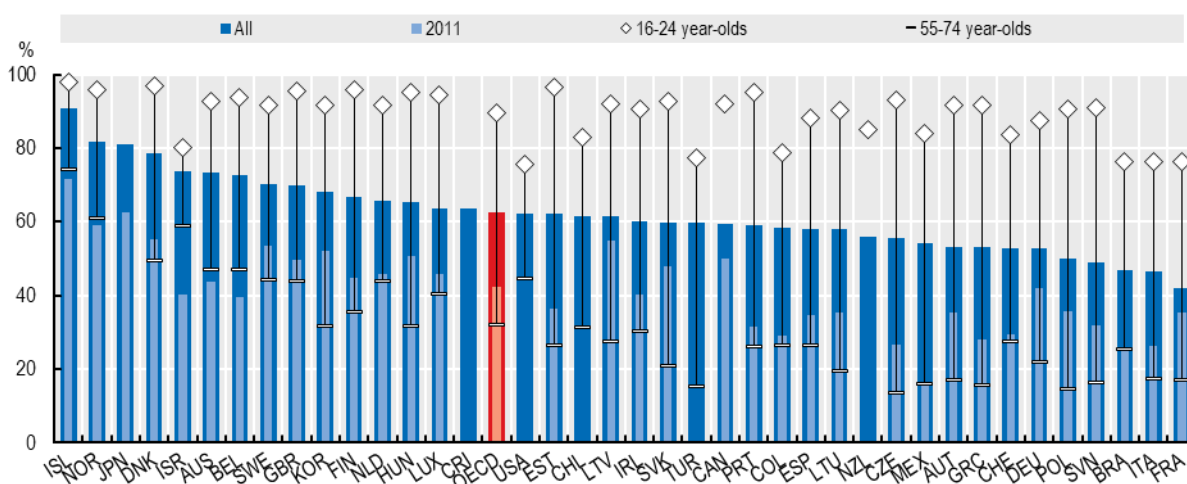


Source: (OECD, 2019^[21]), based on OECD calculations based on (Eurofond, 2015^[78]) accessed November 2018.

90. At the same time, ICT is increasingly used for social interactions. In OECD countries, about 60% of people accessed social networks through the Internet in 2018, and the use of social networks increased in every OECD country during 2011 – 2017 for which data were available (OECD, 2019^[27]) (Figure 11).

Figure 11: Social networking is prevalent

Individuals who used the Internet to access social networking sites, by age, as a percentage of Internet users in each age group, 2018



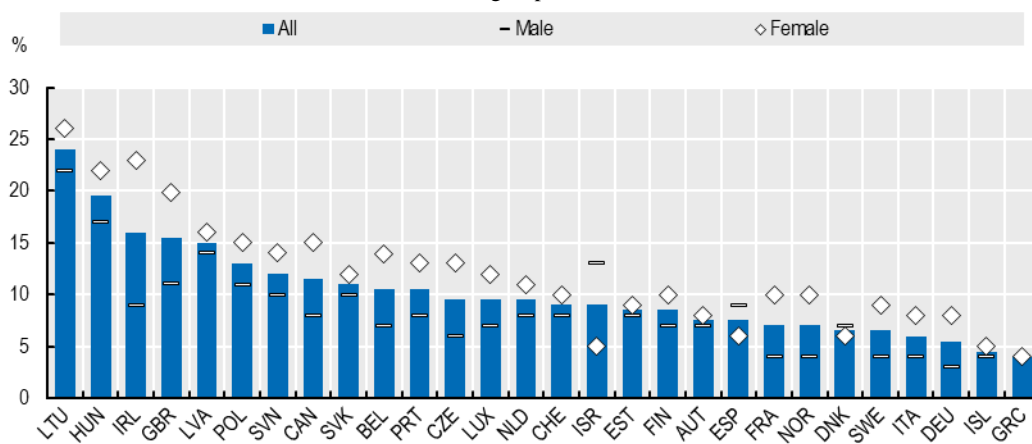
Source: (OECD, 2019^[21]), based on (OECD, 2019^[54]), accessed December 2018.

91. The use of ICT might have consequences on mental health, especially among children and young people. In 2015, an average 15-year old person from an OECD country spent more than two hours per weekday online after school. As significant use of online technologies is a relatively recent phenomenon, there is little hard evidence on the link between this and mental well-being (OECD, 2018^[79]). However, existing evidence does

show that a little bit of Internet use can be slightly beneficial for children and young people, while absence of online activity or excessive use can each have a small negative effect (OECD, 2018^[79]). Excessive use of ICTs is associated with mental illness, and with lower-quality sleep. Also, approximately 9% of 15-year-olds in the OECD have been subjected to cyberbullying, but due to the fact that victims are reluctant to report the facts, the percentage could be even higher (Figure 12) (OECD, 2019^[2]). Social media can also contribute to eating disorders and body image issues (OECD, 2018^[79]).

Figure 12: Many children across the OECD report having experienced cyberbullying

Children's exposure to cyberbullying through messages, by gender, as a percentage of all children aged 15 in each group, 2013.



Source: (OECD, 2019^[2]), based on (WHO, 2016^[80]).

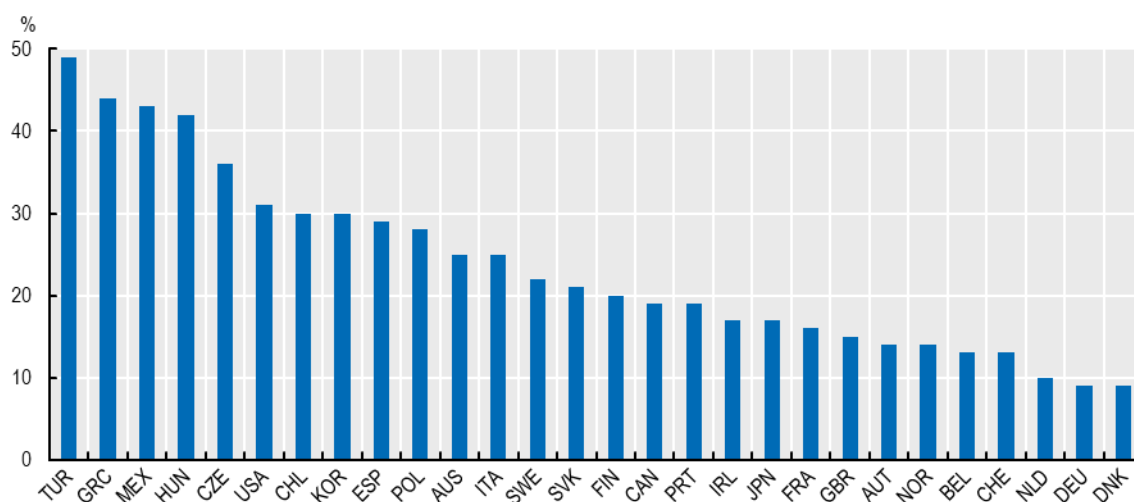
92. Digital technologies also affect social interactions, and the formation and composition of communities. An interesting area of research is how people carry out interpersonal relationships, how they behave in these relationships and how they express their feelings and worldviews. One focus of this research is the impact of online interactions on social interactions offline (OECD, 2019^[81]). People might behave differently online, and special care must be taken to prevent hate or discriminatory speech through online media.

93. In regards to people's engagement in society, digital methods create new ways of sharing and consuming news, participating in the political process or discussing politics. They can encourage governments, citizens and other stakeholders to communicate in a more open and transparent manner. They could also enable the development of more people-centric and user-driven policies. Many governments have designed digital government strategies with the goal of increasing citizen engagement in political life. Some governments have used digital technologies to improve efficiency in administrative services, while others have used them to progress on e-government by putting in place more user-focused services (OECD, 2016^[82]). Over 30 OECD countries use digital technologies for public consultations conducted over the Internet (OECD, forthcoming^[83]). However, the spread of disinformation through digital media has also emerged as a threat to political processes and democracy, although the phenomenon is not yet well-understood. Many individuals across the OECD have reported being exposed to disinformation, with the figure reaching almost 50% in Turkey (OECD, 2019^[2]) (Figure 13). In view of this risk, some social platforms have been introducing measures against disinformation, while governments are exploring changing communication and broadcasting laws to deal with

the problem (Facebook, 2018^[84]; Poynter, n.d.^[85]). The risk is increasing further due to advancing techniques for altering photographs, audio and video. The use of personal information for targeting political messages is also a concern.

Figure 13: Reported exposure to disinformation varies across the OECD

Share of individuals who reported having come across completely made-up stories in the last week, 2018.



Source: (OECD, 2019^[2]), based on (Newman et al., 2018^[86])

94. In view of these various considerations, new norms might need to be developed and ethical frameworks put in place to safeguard people's well-being from potentially disruptive effects of digitalisation.

95. OECD work in this area includes the report *How's Life in the Digital Age*, policy brief *Children and Young People's Mental Health in the Digital Age* and a background paper on *The Local Implications of Digitalisation for Smart Cities*.

Questions for discussion:

- the role of policy in supporting the uptake of innovative solutions in a safe, impartial and even-handed manner, while paying utmost attention to imperative public policy interests surrounding privacy, digital security and ethics;
- the potential benefits, while addressing issues, such as spread of disinformation in the digital age, safeguarding ethical frameworks when sharing information online, protecting under-privileged groups and children in using the smart solutions and the Internet, and combatting misbehaviour in cyber-space;
- what they anticipate from data-driven government, how to increase civic engagement, and what the associated risks may be.

4. ITEM 10: REAPING AND DIVERSIFYING THE BENEFITS OF TRADE IN THE DIGITAL ERA

96. A number of current concerns about the trading system focus on areas where trade rule-making has not kept pace with changes in the global economy, both for digital trade and areas where international competition is hindered by distorting measures, from regulatory restrictions on trade to government subsidies and other support measures which contribute to global excess capacity in key industrial sectors. These challenges underscore the need for international dialogue and cooperation.

Digital Trade

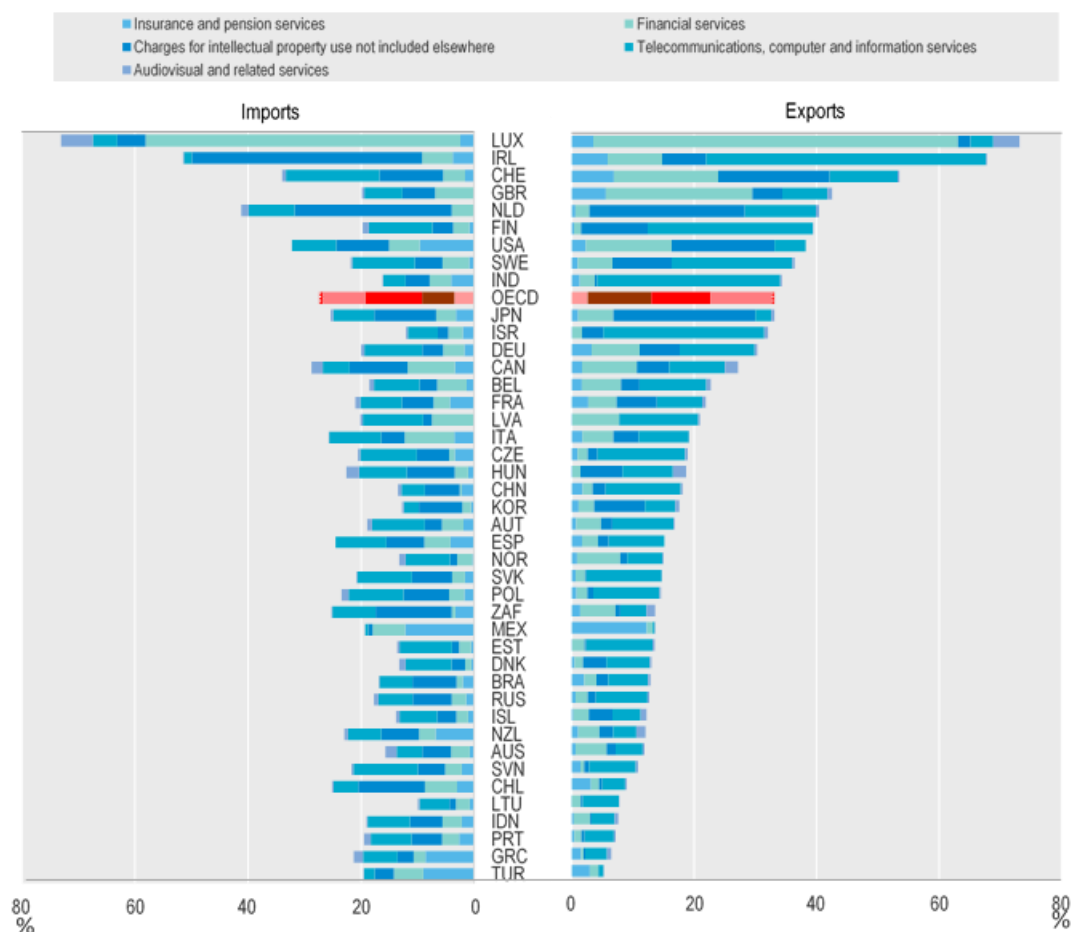
97. Digitalisation cut the cost of engaging in international trade, connecting businesses and consumers globally, diffusing ideas and technologies, and facilitating global value chains (GVCs). Today, more small parcels and lower-value digital services (applications) are traded internationally; more services are becoming tradable; and goods and services are increasingly bundled in ‘smart’ products. These changes bring new opportunities and challenges in ensuring that the benefits from digital trade are realised and shared.

98. While there is no single definition of digital trade, there is a general agreement, in particular based on characterisations by the OECD and the WTO, that it comprises all trade transactions, goods and services, that are either digitally ordered or digitally delivered (OECD/WTO, forthcoming^[87]; OECD, 2017^[88]; López González and Jouanjean, 2017^[89]). Although very difficult to measure and in the context of lacking internationally comparable statistics, the available data evidence suggests that digital trade is growing. More enterprises, across manufacturing and services, are engaged in cross-border electronic sales.

99. Looking only at trade in digitally deliverable services, it represents 23% of total services imports and 28% of total services exports (Figure 14) (OECD, 2019^[27]).

Figure 14: Trade is strong in digitally deliverable services

Trade in predominantly digitally deliverable services, as a percentage of total services exports and imports respectively, 2017.



Source: (OECD, 2019^[21]), based on OECD calculations based on (OECD, n.d.^[90]), (OECD, n.d.^[91]), (WTO, n.d.^[92]).

100. Digitalisation also helps overcome some of the costs of engaging in international trade, resulting in more exports of digitally deliverable services, sophisticated manufactured goods and agricultural products (López González and Ferencz, 2018^[93]). Technologies from digital matching services to online payment systems are opening new export markets (OECD, 2018^[94]).

101. Smaller firms are also benefiting from digital inputs, such as cloud computing services which can help SMEs access IT services with little upfront investment and scale up (or down) IT functions in response to demand. Modern firms use "Skype, WhatsApp or Viber for communications, Google and Dropbox for file sharing, LinkedIn for finding talent, PayPal for transactions and eBay, Tokopedia, Amazon and increasingly Facebook, for sales" (Box and Lopez-Gonzalez, 2017^[95]). Better and faster access to information can also help SMEs compete on a more even footing: data from eBay shows that SMEs that use online platforms are more than five times more likely to export than traditional SMEs (ICC, n.d.^[96]). However, national regulations that create barriers to engaging in digital trade can be difficult for SMEs (ICC, 2018^[97]). The OECD Future of Business Survey showed

that nearly half of exporting SMEs (45%) reported that more than 75% of their international sales depend on online tools (Facebook/OECD/World Bank, 2017_[98]).

102. Developing policies to fully capitalise on digital trade requires solid evidence but currently, no systematic data collection exists on the classification of trade as “digital”, the breakdown of trade by products and services, partner countries and institutional sectors such as business, consumers and government (OECD, 2017_[88]). There are as yet almost no internationally comparable statistics on digital trade, in particular concerning cross-border data flows, and especially flows with no explicit monetary value, nor on the extent to which firms use digital channels, especially SMEs (OECD, 2017_[88]). There are questions in regards to multinational companies, including their ability to relocate digital assets to where they are most cost effective, impacting on national tax receipts but also on measures of trade and GDP (OECD, 2017_[88]).

103. However, efforts to fill these statistical lacunae are accelerating, including through the development of new international guidance. The OECD and the WTO for example, as co-chairs of the Inter-Agency Task Force on International Trade Statistics are developing a Handbook on Measuring Digital Trade that provides a conceptual framework and definition for internationally comparable estimates of digital trade, whilst also providing practical guidance for compiling trade data. Importantly, as current national capacities to fully measure digital trade lack the target definition and concepts, the Handbook, designed to be a living document updated as new national practices become available, includes recommendations to improve national statistical capacities.

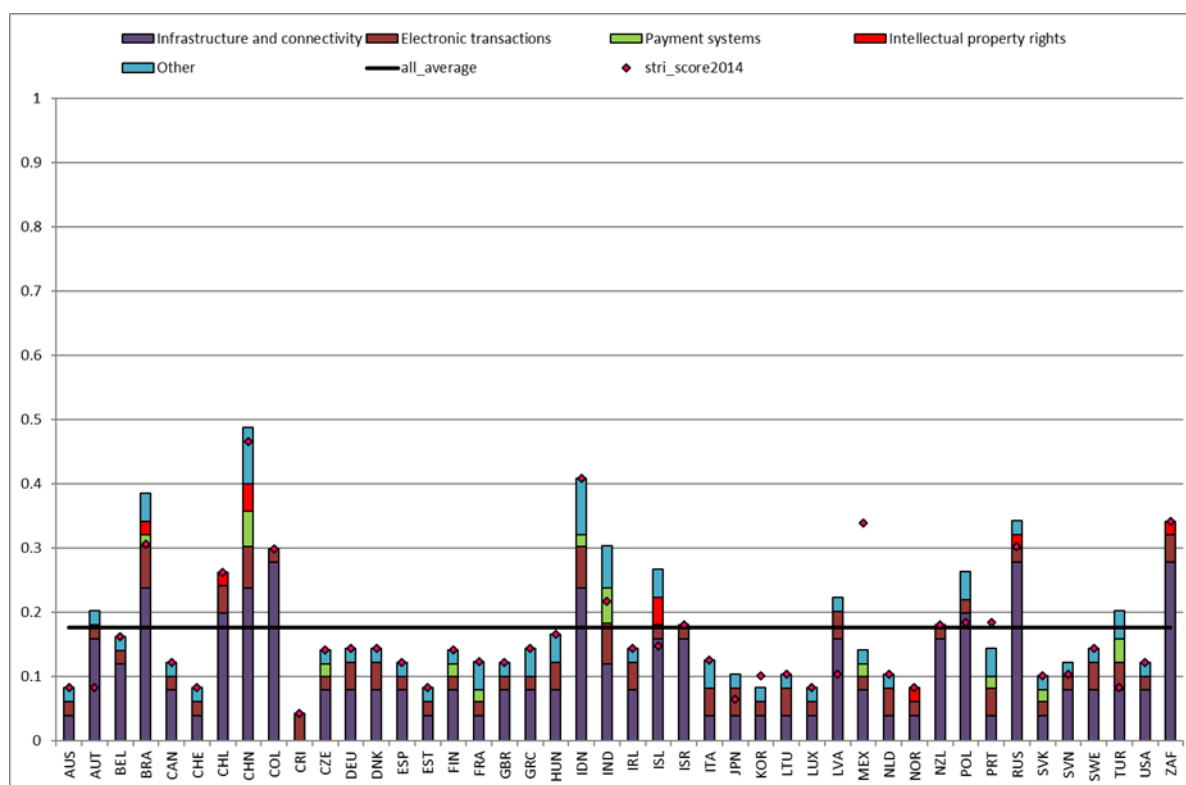
104. There are also questions about the adequacy of current trade rules. While existing trade rules are technologically neutral, they might require clarification to reflect new issues raised by digital trade. For example, whether a product is a good or service and the borders it crosses have been traditionally determined which trade rules apply, however, these are increasingly blurred in digital trade – such as smart products and 3D printing.

Regulatory issues in digital and data flows

105. The nature of measures affecting digital trade is also changing. Simple transactions, such as the purchase of an App, rest on a series of enabling factors, including access to digital networks, the ability to pay electronically, and the tariff and non-tariff barriers faced by the physical device where the App is installed. A limit on one of these transactions will affect the need or ability to undertake the others. Policy thus needs to be more holistic, considering the full range of measures, across goods and services, which affect digital trade.

106. Services are critical in enabling digital trade, whether for goods or services, so removing barriers to services trade is key for market openness in the digital era. The OECD’s new Digital STRI reveals a diverse and complex regulatory environment (Figure 15). Some of the most common measures relate to policies that impede access to communication infrastructure and movement of information across networks. Less common are barriers affecting electronic transactions and payments. However, other impediments such as the obligation to establish a local presence before engaging in digital trade are also common. The regulatory environment for digital trade is increasingly tightening, particularly for measures affecting infrastructure and connectivity, including the movement of data (Ferencz and Gonzales, 2018_[99]).

Figure 15. Digital STRIs, 2018



Source: OECD Digital STRI Database.

107. Trade and production are now heavily dependent on data. Data enables the co-ordination of international production through GVCs, helps SMEs reach global markets, can be an asset that can be traded, or a conduit for delivering services, and is key for trade facilitation. However governments are increasingly conditioning the transfer of data across borders or requiring that data be stored locally (Casalini and López González, 2019^[31]).

108. There are many reasons why countries regulate data flows. One is to safeguard privacy and personal data. Another is to meet other regulatory objectives such as access for audit purposes. Restrictions might also be aimed at protecting national security, or enabling national security services to access and review data. Finally, restrictions may be aimed at helping develop domestic capacity, as a form of digital industrial policy.

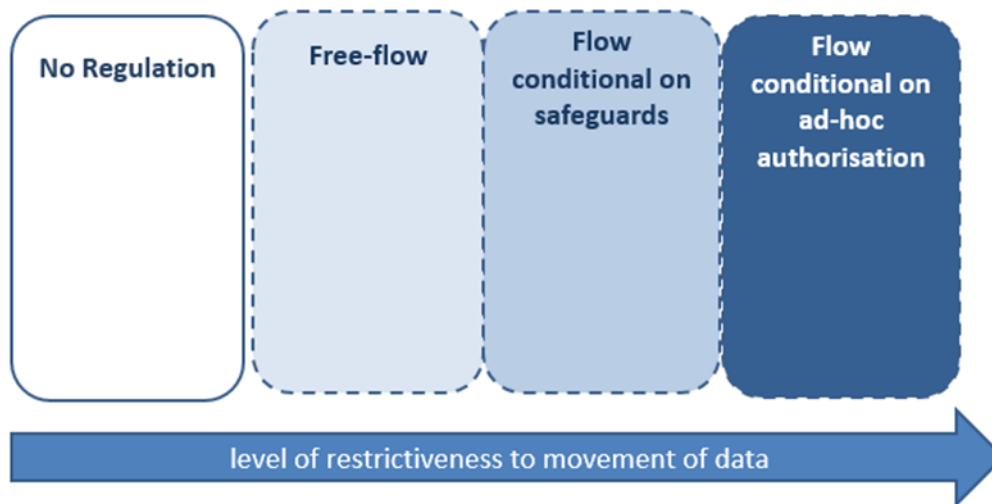
109. Similarly, not all data, or data regulations, are the same. Four broad approaches to regulating cross-border data flows are emerging (Figure 16). These are not mutually exclusive; different approaches can apply to different types of data even within the same jurisdiction (health data, for instance, might be subject to more stringent approaches than data related to product maintenance).

- At one extreme, there is no regulation of cross-border data flows, usually because there is no data protection legislation at all (largely least developed countries). While this implies no restrictions on the movement of data, the absence of regulation might affect the willingness of others to send data;
- The second approach does not prohibit the cross-border transfer of data nor does it require any specific conditions to be fulfilled in order to move data across borders,

but provides for ex-post accountability for the data exporter if data sent abroad is misused;

- A third approach permits transfers only to countries with an adequacy determination (i.e. a public or private finding that the standards of privacy protection in the receiving country are adequate); and/or where appropriate private sector safeguards, such as contractual mechanisms, are provided; or in the case of some narrow exceptions;
- The last broad approach relates to systems that only allow data to be transferred on a case-by-case basis subject to a review and somewhat discretionary approval by relevant authorities. This approach relates to privacy but also to a more sweeping category of data referred to as “important data”, including in the context of national security.

Figure 16. Typology of cross-border data flow regulation



Note: Data regulations include different types of regulation relating to data transfers and local storage requirements.

Source: (Casalini and López González, 2019^[31]).

110. Digital trade promises new opportunities for individuals and firms of all sizes, but also raises new challenges. In recognition of this, a group of WTO member countries have committed to negotiating a digital trade (e-commerce) agreement (WTO, 2019^[100]). These discussions can play an important role in helping to ensure market openness and a level playing field for international trade in the digital era. To help support these discussions, OECD work on digital trade aims to help unpack the issues, providing new frameworks for thinking about policy and measurement (López González and Jouanjean, 2017^[89]); identifying what matters for market openness in digital trade (López González and Ferencz, 2018^[93]; Casalini, López González and Moïse, 2019^[101]; Ferencz, 2019^[102]); and bringing data to inform debate on trade and cross-border data flows (Casalini and López González, 2019^[31]).

Levelling the International Playing Field

111. A further issue on the international trade agenda, relates to government measures that distort international markets. The OECD has longstanding work measuring government support in agriculture, fossil fuels and fisheries and has recently expanded this work to industrial sectors, starting with the aluminium value chain. This work underscores that: (i) government support needs to be understood in the context of value chains as upstream support can have the effect of supporting downstream production; (ii) there is a significant transparency issue, with information on support programmes not readily available from governments; (iii) a wide range of measures affect the sector, including: export bans, export taxes and incomplete VAT rebates, import tariffs, energy subsidies, budgetary support and tax concessions, as well as loans and equity provided on preferential terms ; (iv) state involvement in the sector is high, with state influence at least as important as ownership, and SOEs are both important recipients and providers of below-market-cost inputs as well as loans and equity investments. The work of the G20 Global Forum on Steel Excess Capacity, facilitated by the OECD, also represents a multilateral effort to build transparency and enhance dialogue in this complex policy area.

112. Market distortions are also affecting the high tech industries and digitally-intensive sectors in ways that lower their incentives or ability to innovate More work will be needed in the future in this area.

113. Recent OECD work has also explored policies and measures that can “force” technology transfer and has arranged them along a continuum according to the level of concern they raise for policy makers. Such policies may include forced disclosure of source code or mandatory joint-venture requirements.

Questions for discussion:

- how trade in the digital era can improve not only aggregate outcomes but also help to contribute to inclusiveness by enabling those left behind and underrepresented groups, such as women, SMEs, indigenous groups, and developing regions, to participate in and benefit from trade; how to balance the need to facilitate flows of data across borders (which is essential to trade in the digital era) with privacy and security considerations;
- potential barriers that may affect competition, innovation and growth, and other emerging issues, such as how to promote quality infrastructure;
- how to ensure that supporting analytical work be multidimensional and to mainstream the incorporation of various aspects of identity, including gender;
- how to address current challenges facing global trade more broadly, including other market distorting measures, from the viewpoint of exploring the means to ensure a level-playing field.

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