Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development

23-May-2016

English - Or. English

Directorate for Science, Technology and Innovation
Committee on Industry, Innovation and Entrepreneurship
Committee on Consumer Policy
Committee on Digital Economy Policy
Committee for Scientific and Technological Policy

SEIZING THE BENEFITS OF DIGITALISATION FOR GROWTH AND WELL-BEING

(Note by the Secretary-General)

Meeting of the Council at Ministerial Level, 1-2 June 2016

Background Document

Item 3: Enhancing Productivity for Inclusive Growth.

Breakout Group 2 – Preparing for the Next Production Revolution (Innovation, Entrepreneurship and the Digital Economy).

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JT03396415

Complete document available on OLIS in its original format

DSTI/IND/STP/ICCP/CP(2016)3/REV1
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SEIZING THE BENEFITS OF DIGITALISATION FOR GROWTH AND WELL-BEING

Introduction

1. As the diffusion and use of digital technologies increases, and the cost of data collection, storage and processing declines, governments, businesses and individuals are increasingly migrating their social and economic activities to the Internet. The take-up of digital technologies has now reached new heights: 80% of OECD citizens have broadband subscriptions with the majority accessing the Internet via a smartphone, ushering in an era of ubiquitous computing. In emerging economies too, broadband is becoming widely available thanks to the spread of mobile broadband networks. The smartphone is both a platform and the leading example of a linked device, and the harbinger of the Internet of Things, with between 20 and 50 billion devices expected to be connected to the Internet globally by 2020.[1]

2. As the digital economy permeates the world economy, data becomes more important. It is increasingly essential to innovation, trade, global value chains, health, education and government services as well as to social interaction itself. More broadly, there are few aspects of our lives that remain untouched by digitalisation. These transformations have already brought large benefits and have the potential to bring many more, but are also disruptive as individuals, businesses and institutions have to adapt to this new reality. In the years ahead, the ongoing transition to the Internet of Things will require governments to carefully review their policies and regulations for innovation, competition, privacy, trade and investment, consumer protection, and especially for jobs and skills.

3. As is typical with technology-induced structural change, the pace of this transformation is uneven with some countries and socio-demographic groups lagging behind. While nearly all (95%) adults in Iceland, Norway, Denmark and Luxembourg were accessing the Internet in 2014, only half of the adult population in Turkey and Mexico, and 20% or less in India and Indonesia did so (Figure 1). Differences within countries are linked primarily to age and education, often intertwined with income levels. In most OECD countries, uptake by young people is now nearly universal, but there are still wide differences for older generations.

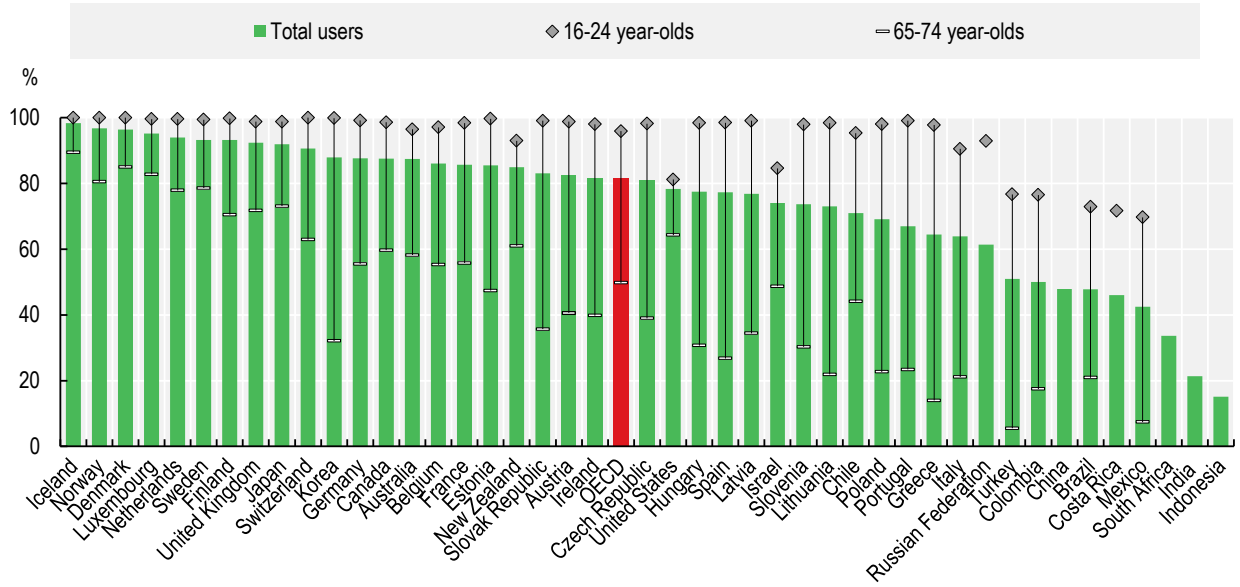
4. Businesses also are increasingly using the Internet. Almost no business today is run without the help of information and communication technologies (ICTs). In 2014, most businesses had a web page and used e-mail (Figure 2). However, the use of more sophisticated applications, which reflect deeper integration in the digital economy, has a much higher variance, with small business lagging significantly. This lag in the diffusion of digital technologies to SMEs may also affect their productivity performance. Recent OECD work points to a strong divergence in productivity growth between global frontier firms, which have continued to experience strong productivity performance, and other firms, that have increasingly fallen behind (OECD, 2015a). Previous OECD work found that digital technologies can have considerable impacts on productivity growth, but mainly when investments in ICT are combined with

[1] Digitalisation is closely linked to the ongoing Next Production Revolution that results from the impact of new digital technologies, such as robotics and additive manufacturing, but also incorporates important technological changes in other areas, such as biotechnology, nanotechnology or advanced materials. A paper on this topic is being provided to the June 2016 OECD Ministerial Council Meeting under the code C/MIN(2016)5.

investments in complementary assets, such as human capital, organisational changes and process innovations, i.e. knowledge-based capital (OECD, 2004). Moreover, ICT-related changes in firms are typically part of a process of search and experimentation, where some firms and new business models succeed and grow and others fail and disappear. Countries with a business environment that enables this process of creative destruction may be better able to seize benefits from digital technologies than countries where such changes are more difficult and slow to occur.

Figure 1. Internet users, by age, 2014

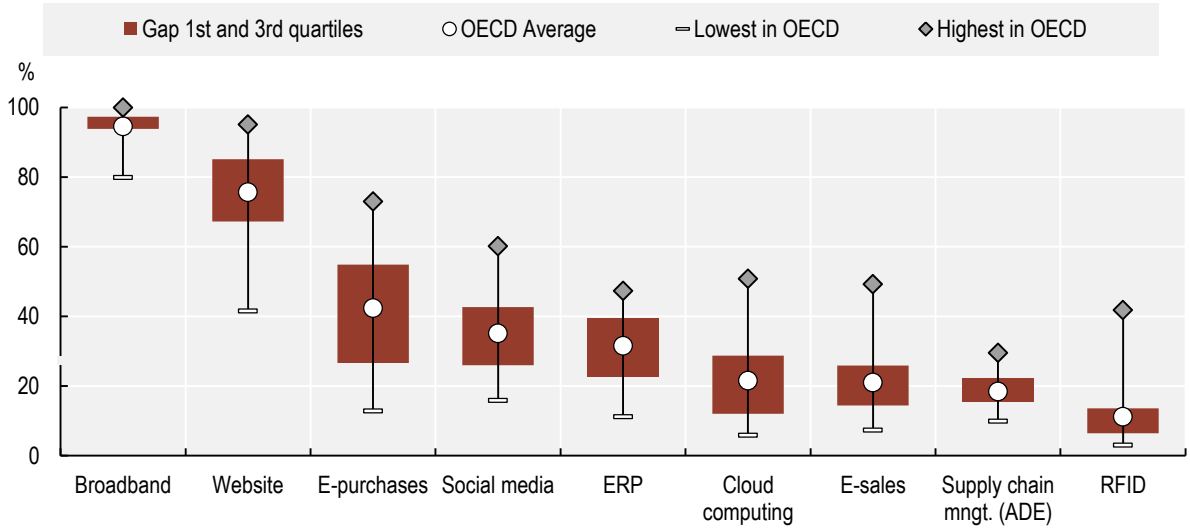
As a percentage of the population in each age group



Source: OECD (2015b), based on OECD, ICT Database; Eurostat, Information Society Statistics Database; ITU, World Telecommunication/ICT indicators Database and national sources, July 2015. See original source for detailed footnotes and references, data available at: http://dx.doi.org/10.1787/888933274795

Figure 2. Diffusion of selected ICT tools and activities across OECD countries, 2014

As a percentage of enterprises with ten of more persons employed



Source: OECD (2015b), based on OECD, ICT Database; Eurostat, Information Society Statistics and national sources, July 2015. See original source for detailed footnotes and references, data available at: http://dx.doi.org/10.1787/888933274447

5. As the Internet becomes essential to a wide variety of activities, these remaining gaps in the uptake of ICT by households and firms are increasingly important for policy, to help ensure that the digitalisation process is inclusive. Moreover, the ongoing digitalisation of the economy and society holds many promises to spur innovation, increase productivity and improve services in a wide range of areas including health, finance, agriculture, public governance, tax administration, transport, international trade & investment, education and the environment, among others.

6. At the same time, digitalisation can be disruptive. It transforms not only organisations' front and back-office processes, but also leads to many new business models, e.g. in the context of the collaborative or platform economy. It is already having wide-ranging impacts on work and production, raising important policy challenges including trust, privacy, security, consumer policy, competition, taxation, and jobs and skills, to name but a few.

7. Failure to address these issues adequately could lead to economic inefficiencies, a worsening of inequalities and an erosion of the social fabric, and could reduce the potential impacts of digitalisation of growth and productivity. A coherent and comprehensive policy approach is therefore necessary to harness the benefits of digitalisation for more – and more inclusive – growth and for addressing global challenges like climate change, widespread development and ageing populations.

Key policy issues

8. The ongoing digitalisation of the economy and society is affecting policies in many areas, ranging from taxation, to competition, to financial systems, to jobs and skills, and to innovation itself. Some of the key policy issues include:

- ***Digitalisation and jobs***: The world of work is expected to be substantially transformed as a result of digitalisation. This will include both the loss of jobs involving routine tasks that can be automated, the creation of jobs in new emerging areas as well as changes in the way work is organised. Some of these changes could result in higher unemployment, polarisation and greater job insecurity if policy reforms are not implemented to facilitate effective labour mobility and social protection mechanisms. The policy question is how labour market, training and social policy will have to be adapted to address the challenges and grasp the opportunities emerging from the digitalisation of the economy.[2]

- ***Skills for the future***: Developing skills that can help equip people for the future is particularly relevant to the digital economy. There is an urgent need to upgrade people's existing skills, ranging from basic skills for all people to engage in the digital economy and society; to more general skills for all workers, and to specialist skills for those who develop the infrastructure and applications. A key issue is the policies that are needed to re-skill and re-train workers who are negatively affected by changes induced by digitalisation. And the question is whether re-skilling these individuals will successfully equip them for the new digital economy, or whether supplementary measures will be required?

- ***Access and inclusion:*** Enhancing connectivity across all individuals is important to reduce remaining digital divides. While access to digital technologies has increased enormously over the past decade (Figure 1), new digital divides are emerging, linked to a lack of adequate skills and a lack of use and access to digital technologies at work or in education. The pervasiveness of ICTs

[2] See MCM background document DELSA/ELSA(2016)8 "Anticipating Change: Work, Skills and Job Quality", for further detail on digitalisation, jobs and skills.

in all aspects of life implies that individuals with poor levels of proficiency in information processing skills are likely to find themselves at high risk of losing their job. Moreover, if large proportions of the adult population have low proficiency in information-processing skills, the introduction and adoption of productivity-improving technologies and work organisation may be hampered; and that, in turn, could stall improvements in living standards.

- ***Ensuring trust – privacy, security and consumer protection***: With increasing interconnectedness, a dynamic and innovative e-commerce marketplace has developed. But as these online marketplaces grow and the landscape for consumers becomes more complex, regulatory and consumer protection challenges are emerging. The provision of well-tailored consumer protections can foster trust and provide the opportunity for the online marketplace to prosper. Moreover, in light of the increased networked interdependence of our societies, privacy and security concerns are more prevalent than ever. Governments and business need to set the conditions for greater co-operation in developing and implementing privacy and security risk management frameworks that are aligned with the economic and social strategic vision for the digital economy.

- ***Regulatory incumbency and the political economy of reform***: Digital technologies are often considered disruptive, enabling new entrants in markets, challenging incumbents and existing business models. Such disruptive innovation can be challenging, but is often necessary to develop new breakthrough innovations, *e.g.* in areas such as climate change. In several strands of OECD work, attention has recently been drawn to the respective roles of incumbents and challengers, e.g. young innovative firms, where policies and regulations sometimes (inadvertently) give greater weight to the needs of incumbents than of challengers, possibly slowing down innovation and structural change in the economy. At the same time, policies governing exit also affect the pace of creative destruction and the balance between the survival of high and low productive firms. Reviewing existing policies and regulations is therefore important, to ensure they facilitate innovation and structural change in the economy.

- ***The future of productivity growth:*** As with an earlier phase of digitalisation, when the economist Robert Solow stated that "we see computers everywhere but in the productivity statistics",[3] the current wave of digital technologies (cloud computing, linked sensors, "big data" analytics) is not yet being mirrored in strong and sustained productivity growth. This is possibly due to a lack of complementary investments, e.g. in skills and organisational change; a lack of productivity-enhancing resource re-allocation, or other factors and policies. At the same time, there are concerns that the progress of digitalisation will enhance ongoing trends towards growing inequality where some may be left behind. Ensuring that future productivity growth is also inclusive is an important challenge for policy. Moreover, digitalisation raises important challenges for the measurement of growth and productivity.

- ***Digitalisation to address social and environmental challenges***: Due to the increasing application of ICTs in areas such as health, food, agriculture & fisheries, transport, water, pollution and climate, the volume of potentially exploitable data related to underlying conditions and pressures, individual and firm behaviour, and their downstream consequences is growing rapidly ("big data"). This has important implications both for the cost of achieving given policy objectives to meet such challenges, the design of the policy measures themselves due to falling administrative and transaction costs, and policy analysis and evaluation. But in many circumstances, such as

[3] Robert Solow, "We'd better watch out", New York Times Book Review, July 12, 1987, page 36

health services, the access and use of these data raise privacy issues. How can these issues be addressed, and are the trade-offs between more intensive use of data for addressing social priorities and privacy protection being made at the appropriate levels of government?

- ***Public sector digitalisation:*** As digital technologies have become indispensable at all stages of the policy cycle, governments are preparing for a data-driven public sector that can manage and make responsible use of the growing wealth of available information. However, increased pressure to optimise the benefits of data is accompanied by risks linked to granting and enforcing rights to access, share and re-use of government data and information. Appropriate skills and infrastructure within the public sector are essential to reap the benefits of data, as are suitable analytical tools. By providing system-wide governance structures that are 'fit-for-purpose', governments can better balance the new opportunities and risks of data use to promote cross-agency service design and delivery, improve policies and regulations, enhance accountability and transparency, and create more equitable relationships between governments and citizens.

- ***Measurement, evidence and evaluation***: Designing better policies for the digital economy and society will require improved measurement and evidence, including on the spread of digital technologies themselves. As noted above, digitalisation also raises challenges for the measurement of growth and productivity. The OECD has a large body of work underway on improving the evidence base for policies and improving the evaluation of existing policies and regulations. Building this evidence base is increasingly challenging, but some new opportunities are also emerging thanks to digital technologies, e.g. through the use of big data analytics and non-official data sources. In addition, digital technologies and a greater use of data may allow for new approaches to policy design, delivery and evaluation.

Key features of digitalisation

9. To develop a cross-cutting approach to digitalisation, it is also important to better understand some of the underlying features of digitalisation, and how these affect policy development, such as:

- *Decentralisation versus control*: Digital technologies and networks enable not only large firms and institutions, but also consumers, small firms, and individuals to create, innovate and produce through the Internet, thus involving a wider community into economic and social activities, with the potential to lead to a less centralised economy. At the same time, the control of networks and platforms is becoming increasingly centralised, raising new questions about competition and control in the digital economy.

- *The nature and ownership of capital*: In the digital era, a growing share of business investment consists of knowledge-based (intangible), rather than tangible capital, much of which can be digitised. Likewise as cloud computing services becomes widely available, large investments by individual firms may no longer be needed. In the same vein, digitalisation will allow for more efficient sharing of services of capital by individuals or firms which may obviate the need to own such capital (e.g. car sharing). These trends raise a host of new policy questions around investment and capital, e.g. regarding returns and their distribution, ownership, control and governance, to name just a few.

- *Scale effects*: Contrary to physical products, digital products can be delivered with almost zero marginal costs anywhere and anytime in the world, enabling firms and platforms to have global scale with little mass, e.g. global firms sometimes have very few employees. The resulting scale effects can contribute to so-called winner-take-all markets, raising new policy challenges in many areas.

- *Markets and the emergence of new intermediaries*: The digital economy is inherently global and is affected by new intermediaries and institutions that can enhance the efficiency of markets by reducing transaction costs challenging existing policies to regulate these markets.

- *The nature of decision making*: Digitalisation – notably the rise of so-called big data – is enabling less hierarchical decision-making based on more information and also a greater use of expert systems, and increasingly, artificial intelligence, raising questions on how and where decisions affecting economy and society are being made.

10. It is the combination of these – and other - cross-cutting features of digitalisation that make the ongoing transformation so large and potentially disruptive. Digitalisation affects almost every area in economy and society, giving it enormous *scope*; has large *scale* effects, as highlighted above; and is moving faster (*speed*) than previous technology-driven transformations, with new Internet-based technologies, business models and platforms spreading very rapidly across the world. The high speed of the transformation process amplifies the importance of scale and other first-mover advantages, with scale before profits remaining the quintessential Internet business model. The combination of scope, scale and speed raises new challenges for policy makers, which are not only required to address a system-wide transformation, but also to respond to rapid and frequent changes in a timely fashion.

The OECD response

11. The OECD has long been working on these issues and has a wide range of activities underway to address these challenges. At the core is the work of the Committee on Digital Economy Policy (CDEP) that is undertaking much of the work on regulation and competition in digital markets, digital innovation, measurement of the digital economy, and the need for privacy, security and trust that are fundamental to the functioning of the digital economy (OECD, 2014a; 2015c; 2015d). The work of this Committee is complemented by that of the Committee on Consumer Policy (CCP) that is focusing much of its work on the need for consumer protection in the digital economy (e.g. OECD, 2013a; OECD, 2016a).

12. The CDEP and CCP Committees, working with several other Committees, are organising an OECD Ministerial-Level meeting on the Digital Economy: Innovation, Growth and Social Prosperity, which is planned for 22 and 23 June 2016 in Cancun, Mexico. The meeting will address a number of key aspects of the digital economy, including: 1) Internet Openness and Innovation; 2) Building Global Connectivity; 3) Trust in the Digital Economy; 4) Jobs and Skills in the Digital Economy.[4]

13. A wide range of other work is underway across the OECD that addresses other key aspects of the digitalisation of economy and society. Specifically:

- **Taxation**: The OECD/G20 Base Erosion and Profit Shifting (BEPS) Project included an important stream of work on the Digital Economy. The BEPS Action 1 Final Report, *Addressing the Tax Challenges of the Digital Economy*, highlighted the importance of the ongoing monitoring of developments in the digital economy, reviewing and analysing new data, and monitoring the impact of the implementation of the package of BEPS measures on the taxation of the digital economy (OECD, 2015e).
- **Jobs**: Work is currently underway for the Cancun Digital Economy Ministerial meeting to explore the jobs aspects of the digital economy. This issue was also addressed during a Ministerial Forum on the Future of Work held in January 2016 and there is ongoing work at the

[4] See: https://www.oecd.org/internet/ministerial/ for further detail.

OECD exploring the consequences of structural change brought by technological change, globalisation and population ageing on labour markets and social protection.[5]

- **Productivity**: The impact of digital technologies on productivity is on the agenda across several OECD Committees, as part of broader efforts to understand the slowdown in productivity growth (OECD, 2015a).
- **Skills**: Digital technologies both affect education itself, by offering new tools for education and training (OECD, 2015*f*), while also raising many new challenges for skills development, to ensure that the population and various groups of workers have the necessary skills to flourish in the digital economy.
- **Science and Research**: Digitalisation is offering a wide range of new opportunities for science and research, including through better dissemination of research, better collection and sharing of data and information, and greater capabilities for research, thanks to much greater computing power (OECD, 2015*g*).
- **Industry and Entrepreneurship**: Digital technologies are making large contributions to the emergence of a new production revolution[6], and are also enabling new forms of entrepreneurship.
- **Finance**: New forms of financial technologies, e.g., automated intermediation and (algorithmic and high-frequency) trading, as well as distributed ledger technologies applied to payments (e.g. Bitcoin, see Blundell-Wignall, 2014), settlement and other systems have a strong potential to disrupt the financial community, while also making finance more inclusive. Furthermore, cyber risks pose new challenges for the insurance industry, and innovations such as "robo advice" may affect private pensions.
- **Competition**: Competition is playing an important role in making digital markets effective, particularly where new digital entrants are challenging established ways of doing business. It will be important to explore what governments and competition agencies can do to ensure vigorous competition is not stifled through poorly-designed regulation or through digital markets 'tipping' into private monopoly..
- **E-Government**: Digital technologies can help improve the delivery of public services and also offer opportunities for more collaborative and participatory relationships that allow relevant stakeholders to actively shape political priorities, collaborate in the design of public services and participate in their delivery. In 2014, the OECD Council agreed on a Recommendation on Digital Government Strategies (OECD, 2014b).
- **Health**: New digital technologies are rapidly changing existing modes of provision of health care and present opportunities to adapt health systems to evolving population needs (OECD, 2013*b*). The growing role of data gives rise to concerns about privacy and security that must be addressed (OECD, 2015*h*); an OECD Council Recommendation of Health Data Governance is currently being developed.
- **Transport**: Digital technologies are already affecting transport and have the potential to further change the industry, e.g. through the development of autonomous transport or a greater use of big data for transport management (OECD/ITF, 2014; 2015). Digitalisation has also enabled the relationship between consumer and supplier to evolve. It has empowered transportation users with greater mobility opportunities, but at the same time created challenges for policy makers in

5 See: http://www.oecd.org/employment/ministerial/policy-forum/

6 See: http://www.oecd.org/sti/ind/next-production-revolution.htm

finding socially acceptable ways to integrate these new alternatives to the existing regulatory framework.

- **Trade**: Digital technologies are allowing more products to be delivered through digital means, have led to rapid growth in electronic commerce, and are increasing trade in services. Moreover, digital technologies have greatly facilitated the spread of global value chains (OECD/World Bank, 2015). Flows of data are increasingly complementing trade in goods and services.
- **Environment**: Digital technologies can also help improve environmental performance and address climate change across the economy (OECD, 2010). The biggest gains for smarter environmental and economic strategies and applications may be in power generation and distribution, buildings and transportation. The environmental benefits of digital technologies are also evident in areas such as water management, biodiversity protection and pollution reduction. At the same time, digital technologies have large energy needs and result in considerable waste.
- **Agriculture and fisheries**: Digital technologies have a large potential to improve productivity and sustainability across the food value chain, e.g. in using new technologies (big data, drones, internet at sea) to monitor and support environmental performance in agriculture and fisheries (OECD, 2016b).

14. Work in these areas will help to address key policy challenges related to the digitalisation of the economy and society. What is lacking thus far, however, is a fully integrated policy approach. The challenge for policymakers is to identify the policy mix that will enable their economies to maximise the benefits of an increasingly digitalised global economy and adequately address the related challenges.

15. It is therefore essential to develop a better understanding of how digitalisation affects different sectors and policy areas. This can help articulate pro-active, rather than reactive, policies that would contribute to a new growth narrative that recognises the trade-offs between various factors, including the objective of improving productivity and the need to share the benefits of growth more widely. A concerted and integrated approach to address the fundamental challenge of digitalisation could help in:

- assessing the effects of the transformational changes induced by digitalisation on society as a whole and on all parts of the global economy;
- identifying the expected benefits from and issues raised by digitalisation for governments, businesses and individuals;
- examining how strategies and policies can best address these transformations and harness the benefits of digitalisation for more – and more inclusive and sustainable – growth.

16. Such an effort could help develop a strategic vision and policy strategy on one of the fundamental challenges facing our economies and societies. It could provide countries with state-of-the-art guidance on how to respond to digitalisation in a proactive manner and seize its benefits for growth and wellbeing. This will require a coherent and integrated approach – instead of a piecemeal, fragmented one – to an issue that is rapidly becoming a major challenge in almost every area of the OECD's work.

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