

# IMPLICATIONS OF THE DIGITAL TRANSFORMATION FOR THE BUSINESS SECTOR

*Conference summary*

London, United Kingdom  
8-9 November 2018



The ongoing digital transformation holds the promise of improving productivity performance by enabling innovation and reducing the costs of a range of business processes. But at the same time our economies have experienced a slowdown in productivity growth, sparking a lively debate about the potential for digital technologies to boost productivity. Today, as in the 1980s, when Nobel prize winner Robert Solow famously quipped: "we see computers everywhere but in the productivity statistics" there is again a paradox of rapid technological change and slow productivity growth.

Jointly organised by the OECD and the United Kingdom Department for Business, Energy and Industrial Strategy (BEIS), this conference discussed factors that could explain such a puzzle and explored the role of policies in helping our economies realise the productivity benefit from this transformation. The following is an informal summary of discussions, provided as an aide memoire for participants and stakeholders.

## **Opening session**

### ***Summary***

The digital transformation is having a wide-ranging impact on the business environment, creating both opportunities and challenges. Inter-related trends such as e-commerce, big data, machine learning and artificial intelligence (AI), and the Internet of Things (IoT) could lead to large productivity gains for the economy. However, disruption to existing business and social models, as well as established markets, will disrupt the lives of millions of citizens.

To make the best of these changes it is necessary to plan ahead, so that the right policies and institutions are in place as soon as possible. There is a collective need to pull together good analysis and evidence at the outset and to support the development of digital policy responses in areas such as competition, taxation, and trade.

The outputs of the OECD's 'Going Digital' project will improve our ability to measure the impact of this transformation, and to provide policymakers with the tools needed to develop pro-active, whole-of-government policy responses to help their economies prosper in an increasingly digital and data-driven world. The outputs of the project will form the basis of discussion at the Going Digital Summit on 11-12 March 2019.

### ***Introductory Remarks***

*Christopher Sharrock, UK Permanent Representative to the OECD* stressed that the transformation was having a clear effect on business, with the productivity benefits easily spread out via cheaper business experimentation, easier sharing of ideas and simplified global reach. However, he reminded us that we need to be mindful of the challenges ahead, including the paradoxical situation of technological diffusion not leading to productivity gains, and the reality that a limited number of firms has captured many of the benefits of the changes experienced so far. He also reminded participants of the urgent need to upgrade public policies, based on the best available analysis.

*Andrew Wyckoff, OECD, Director Science, Technology and Innovation Directorate*, noted that better understanding of the impact of the digital transformation on the business sector is undoubtedly linked to collecting better data on the diffusion of technology amongst firms. Using this we can better understand business actions, including how and where value is being generated. The OECD is looking at these issues, and related questions through the Going Digital project, a fundamental re-consideration of the political, economic and social impacts of the digital transformation.

*Sam Beckett, Director General EU Exit and Analysis at the Department for Business, Energy and Industrial Strategy*, stated digitalisation is increasingly important across a whole range of activities and interactions between people, businesses, government and other organisations. To make the best of these changes we need to be thinking and planning ahead now, so that the right policies and institutions are in place when this transformation really starts to land. The United Kingdom has recognised the cross-cutting and potentially transformative nature of digitalisation by making AI & Big Data one of the Grand Challenges for its flagship Industrial Strategy.

### Keynote Address

Laurence Boone, OECD Chief Economist, introduced Professor John Van Reenen, Gordon Y Billard Professor in Management and Economics at MIT. After briefly describing Professor Van Reenen's major contributions to a number of relevant topics (digital adoption, the determinants of innovation and the emergence and impact of superstar firms in the digital era), Ms Boone then summarised some of the recent work of the OECD. This included studies on the rising gap between frontier and laggard firms, the close link between the availability of skills and digital adoption rates, and the tendency for digitalisation to contribute to productivity dispersion by bringing higher gains to firms that are already highly productive.

Professor Van Reenen organised his intervention around four main themes: the nature of digital technologies, their effects on productivity, their effects on labour markets via automation or the rise of superstars, and the policy implications of these observations. After comparing the digital revolution to previous major technological shifts, he turned to productivity effects, noting that while they were disappointing taken as a whole (with productivity decelerating in the OECD), these figures improved at the firm level. He stressed, however, that the associated productivity improvements would typically depend on a host of complementary factors, with failures occurring as well (e.g. attempts to digitalise the National Health Service in the United Kingdom). He also noted that organisational change led by talented managers and supported by a skilled workforce appears to be crucial, as does collecting cross-country comparable data.

Moving on to labour markets, Professor Van Reenen warned about excessive alarmism of a future "robocalypse" replacing jobs with machines. He showed that these fears had been common during past technological revolutions, but in fact economies had continued to generate millions of jobs over the past century. In short, as suggested by Acemoglu and Repetto, reinstatement employment effects would countervail the potential job losses due to digitalisation. Professor Van Reenen did, however, see possible sources of concern for the quality of jobs (e.g. in terms of wages), the risk of labour market polarisation, with middle skills jobs declining and a decline in labour shares, partly due to the emergence of superstar firms. Another related source of concern would be the implications of recent 'winner takes all' developments on competitive pressures, although he acknowledged these implications are still to be fully established.

In conclusion, Professor Van Reenen saw both challenges and opportunities for policy makers. Catching opportunities would require implementing skills, trade and competition policies that would encourage improvements in management, training and governance, while at the same time monitoring the uses and abuses of market power. He noted that not all countries were currently following this path.

### **Session 1: Adoption of new digital tools and disruptive technology: What is the role of skills and policy?**

This session aimed to explore the drivers of technology adoption and what policies can do to smooth the digital transformation across firms. The panellists described a variety of factors driving the adoption of digital technologies in firms. Each mentioned the key role of skills, including job-specific and specialised skills, in the willingness to invest in and adopt productivity-enhancing digital technologies. They all also mentioned the importance of culture in the adoption of digital technologies. The question of incentives for digital technology adoption was also discussed by the panellists and skill-boosting mechanisms were identified as a particularly difficult public policy issue.

Baroness Alison Wolf, Professor of Public Sector Management at Kings College, London mentioned that skills systems do not currently focus on ongoing skills development and provision, including in shorter and more intensive bursts.

Debora Revoltella, Director of the Economic Department, European Investment Bank presented survey evidence showing that digital adoption rates in the European Union are below those in the United States, in particular in the services sector, and that European firms tend to lag particularly in the adoption of more sophisticated technologies. She also presented evidence on the reasons why European firms adopt digital technologies at a lesser rate than American firms and identified three key barriers, including firm-size distribution, market fragmentation in services, and a financial system that is skewed towards debt finance. Lack of staff with the right skills is considered a key barrier to digital adoption

by firms, both in the European Union and the United States. Ms. Revoltella also noted potential downside risks of digitalisation such as hollowing-out tendencies for mid-level jobs, job polarisation, risks of too-high market-concentration, as well as cyber-security threats, but explained that these will have to be dealt with whether Europe leads the digital transformation or lags behind and should therefore not be seen as a reason for inaction on the part of policy-makers when it comes to promoting digital adoption.

*Hugh Milward, Director, Corporate External and Legal Affairs at Microsoft*, mentioned that firms that do not adopt AI technologies report extensive costs, skills deficits and culture issues. He noted that firms that do adopt AI report productivity gains of up to 7%, while also mentioning the anxiety of firms about the sustainability of their business model in the digital age.

## **Session 2: The impact of the digital transformation on productivity**

This session discussed the paradoxical phenomenon of wide spread diffusion of new technologies, but a slowdown in productivity growth, seen in many countries and explored the role of policies in changing this, to help economies realise the productivity benefits of the digital transformation.

*Carol Corrado, Research Director in Economics, The Conference Board*, explored the causes of the productivity slowdown, focusing on the missing link between productivity and intangibles in the United States. She showed that both Multifactor Productivity (MFP) growth and the contribution from ICT sectors had declined, suggesting a slowdown in technology diffusion among firms (but not consumers), perhaps suggesting a return to a “new normal” after the productivity boom experienced two decades ago. However, she also noted that the available data is missing much of what is actually going on at firm level, such as increasing investment in data analytics and the value generated by an ever-widening variety of products. In terms of ICT, Dr Corrado noted that while returns on investment continue to rise sharply, investment rates have been going down. In terms of R&D, investments rose sharply in some areas (for example, software development or computer design services) but remained flat in most other areas. Concluding she suggested three possible explanations to this paradox: spillovers from ICT investment and non-R&D intangibles on MFP are weak, leading to a slowdown in investment; or the productivity gains of intangible investment are delayed resulting in a productivity J-curve; or mismeasurement is still significant in IT sectors.

*Professor Mirko Draca, Associate Professor at Warwick University*, also focused on explanations of the productivity slowdown. He argued that most current theories are unable to fully account for the slowdown. However, he argued that new explanations, based on the idea that we are in the latest cycle for implementation of general purpose and evolving technologies, are more convincing and would imply a new productivity boom over the next decade. This is corroborated by two concurrent observations: a surge in R&D and patenting in the AI domain, especially by mature firms (e.g. Google), and a constant increase in the NASDAQ index, a leading indicator of future market returns from investment. This would also fit with previous patterns seen in the dot-com bubble. Nonetheless, major uncertainties remain, such as the possibility of setbacks (as happened with Nokia in the past), the prospect of tech taxes and the sustainability of the current high profit rates. Professor Draca argued that policy should devote more attention to fundamentals, financing basic research and investing in education and training, as well as concentrate on monitoring of markets and developing early warning systems. He also called for a wider use of scenario analysis to analyse worst cases and countervailing effects resulting from disruptive innovations.

*James Manyika, Chairman and Director, McKinsey Global Institute* took a different approach. He noted that future growth in the United States and European Union will have to be driven by productivity to a larger extent than before. He argued some of the productivity deceleration could be due to weakness in demand, leading to a numerator (value added) driven decline in growth as opposed to a denominator (hours) driven slowdown. Drawing from past examples, he showed that productivity increases were driven either by small productivity improvements across all sectors or by strong improvements in few but large sectors. Mr Manyika also underlined the role played by the strong decline in tangible investment since the crisis and stressed that digitalisation has been very uneven across sectors. He also pointed out that the intensity of adoption also varies widely across firms (e.g. while access to broadband is common, the use of the cloud remains subdued). Ultimately, he

joined the other speakers in suggesting that the potential for future productivity increases is high (e.g. via the development of AI) but it could take some time before these occur.

Following these interventions, discussion revolved around the labour market and competitive implications of digitalisation. Technology is having an impact on the labour market, where employment protection has weakened, the gig economy offers unsecure jobs and medium skilled roles are declining. This is leading to hollowing out and polarisation, which is compounded by a slowdown in public and private investment in training. It was noted that without policy action, such countervailing factors would likely worsen the quality of jobs, and displaced middle-aged and medium skilled workers would find reemployment difficult. There was a general concern raised about the future of competitive pressure, particularly with the rise of superstar firms – although whether these are new was a debatable point. It was also noted that ‘winner take most’ dynamics were not only based on size but also on the complementarity with intangibles and there was still a lot of churning occurring among the group of top firms.

### **Session 3 – Competition in a digital world**

The digital transformation will have a profound impact on the way firms enter and compete in the market, particularly as processes become replicable at near zero cost margin. Competition will be vital in driving innovation, and the policies set out by policy makers should reflect this. Data flows, data protection, AI and standards are now recognised as important digital and competition policy issues, with much discussion amongst governments on this subject. But how best can governments respond to this going forward, and what enforcement tools are important for the digital age?

*Bob Fay, Director of Global Economy Program, Centre for International Governance Innovation* used an example of a digital neighbourhood developed by Alphabet, to illustrate the wide-ranging questions on control, ownership and monetisation of data. He noted that whoever controlled the data would then control big data analytics, especially if there are few, or no, rules over how it is used. Mr Fay went on to raise the issue of standards, which are never politically neutral, discussing patents, integrated and interoperable systems, level-playing fields, trust and comparative advantage, all of which could lower or raise transaction costs or trade barriers. All of these factors could be used to block competition he suggested, if the large firms are able to influence the standard-setting process and there are various opportunities for rent seeking. Mr Fay also wondered if standards were already being set by dominant players, and hinted at some of the other potential issue areas related to standards, such as AI or big data, as well as the role for smaller countries in international standards.

*Adam Cohen, Head of Economic Policy in Europe, Google*, agreed that standard essential patents allow for a wider diffusion of technology, and argued for a set of standards, so that there can be interoperability and innovation. He argued that data was finite and its value has never been based on volume, rather on what you can do with such data, particularly through deep learning. For example, he argued that only 6% of Google searches could be monetised. Mr Cohen also noted that many new entrants do not face the same cost as the incumbent, which gives them a competitive advantage and often it is easier to follow than lead when it comes to online markets (he used the example of Uber being followed by Lyft, being followed by Juno).

*Cristina Caffarra, Head of Charles River Associates Europe* pointed out that while some companies are looking at volume (e.g. Microsoft), this does not apply to everyone. The organisations she represents no longer look at the ‘big data soup’, they are looking at whether there is a code of conduct put in place by such organisations to tilt the level playing field in their direction. Ms Caffarra also disagreed with Adam Cohen, stating that not all platforms are equal, and that she does have concerns with those who collect very large amounts of data -- “super aggregators”-- such as Facebook and Google, as competition simply does not seem to be occurring and it is too easy to say there is nothing to be concerned about. Ms Caffarra remarked there is very little finance for advertising based start-ups. However, Ms Caffarra also encouraged policy makers to think carefully as to whether competition policy was the correct format to tackle some of these issues.

Following the interventions of the speakers, the audience asked a range of questions. Of particular note one audience member asked how we rectify theory, which is rational, with reality, which is often irrational. Mr Cohen and Ms Caffarra disagreed, both saying that overall consumers act in a specific

way, as opposed to the individual. Concerns over consumer protection and the creation of monopolies were also raised, which led to thoughts about what the customer desires (and whether data protection is part of this) and the sophisticated nature of the industry and the need to understand how specific markets work. Finally, a member of the audience asked a question on how to measure incentives to innovate. Ms Caffarra agreed that discovering this was important and that it was not very clear at this time.

#### **Session 4 – Business Dynamics and Entrepreneurship**

The digital transformation will bring important changes and lasting implications for business dynamism. It will create new entrepreneurial activities, and may lower the barrier to entry for some. However, it may also have negative impacts, such as opening a gap between those firms who can gain market share and those who cannot not. The OECD's ongoing empirical work on business dynamics and digitalisation has identified two major themes in this policy area. First, digital intensive sectors – especially digital intensive services – are on average more dynamic than other sectors of the economy, exhibiting higher entry rates and higher job reallocation rates. Second, business dynamism has been declining, and declining at a faster rate in digital intensive sectors, especially after 2001.

*Kjell Håkan Närfelt, Chief Strategy Officer, Vinnova, Sweden's Innovation Agency* argued that innovation is necessary to sustain competitiveness. However, the means of value creation today has changed significantly. Mr Närfelt argued that today, value creation is all about creating eco-systems to encourage change.

Presenting the Canadian perspective, *Joy Senack, Chief Innovation Officer at the Canadian Ministry for Innovation, Science and Economic Development* stressed that a mix of policy tools has an impact on innovation and competitiveness. The role of government is to convene different actors in the economy, working together with industry leaders

*Carmen Benitez, Serial Entrepreneur and Founder of Fetch Blockchain Limited* echoed Ms Senack's points, but from a business perspective. She emphasised the need for a minimum viable eco-system, composed of growth accelerators. Ms Benitez also stated that countries need to create innovation hubs, as well as public / private sandboxes, etc.

*Geoff Mulgan, Chief Executive of NESTA* noted that while he agreed in theory with the points made by the other speakers, putting more money into eco-systems doesn't necessarily lead to more innovation. Experimentation is needed to find the optimal balance and ensure that investment leads to innovation.

Following these initial comments, people and skills were highlighted as an important element in a country's innovation strategy. Increasing labour participation has a clear economic rationale and an impact on growth, including, for example developing women's entrepreneurship potential.

Ecosystems, peer learning, consultation, engagement and partnership with business were identified as conditions for successful entrepreneurship and the mindset of public administration is still considered an issue, as entrepreneurs often encounter archaic methods, silo mentality, lack of dedicated resources, funding of strategies and not of projects, and strategic plans not promoting new ideas. The session also discussed data as a lever to competition and developments on the control of own data by SMEs and natural persons.

#### **Session 5 – Tax Challenges Arising from Digitalisation**

Digitalisation and the ways in which it is changing business models are having a major impact on tax regimes, which in turn are having a significant political impact. Responding to a mandate from the G20, the OECD has undertaken work on this subject, and produced an interim report on the Tax Challenges Arising from Digitalisation in March 2018. Given the lack of an international consensus on how to address these challenges and the tremendous political pressure in some countries to take action, some countries have already implemented or proposed short-term unilateral measures. This session considered whether the existing tax rules could meet the demands of digitalisation and, if not, the potential for new measures to be put in place.

*Grace Perez-Navarro, Deputy Director, OECD Centre for Tax Policy and Administration*, opened the session with a presentation on the OECD's ongoing work on the tax challenges arising from

digitalisation. She noted that the OECD's recent work on this topic was a critical component of the OECD/G20 project on Base Erosion and Profit Shifting (BEPS). She explained that the BEPS Action 1 Report on the digitalised economy released in 2015 concluded that it would be difficult, if not impossible, to provide a ring-fenced solution focused on digitalised companies, given that the whole economy was becoming increasingly digitalised. The report provided useful solutions on the indirect tax front that are already generating significant revenues for those countries that have implemented them, but failed to reach consensus on a long-term solution on how best to address the wider direct tax challenges arising from digitalisation. Instead, it concluded that the other BEPS measures (e.g. on transfer pricing, permanent establishments and CFC rules) would go a long way towards addressing the BEPS concerns in relation to digitalisation. It considered but did not recommend various options for dealing with the broader issues and agreed to return to the issue in 2020.

However, in response to the 2017 request by the G20 for an interim report, the work was accelerated. Although the interim report did not reach consensus on policy recommendations, it did include agreement by the over 120 members of the Inclusive Framework on BEPS to review the key international tax concepts of nexus and profit allocation. Ms Perez-Navarro mentioned that the March interim report highlighted three common characteristics of highly digitalised companies that put stress on the current international tax rules: (i) increased reliance on intangibles, (ii) cross-jurisdictional scale without mass; and (iii) data and user participation. However, countries disagree on how to address these issues. Some countries want to wait and evaluate the effect of BEPS recommendations; others favour targeted measures focusing on issues arising from specific digitalised business models; and a third group believes that some of the same tax challenges are raised by more traditional businesses and that therefore a comprehensive international reform of the tax system is necessary. Since the publication of the March interim report further work has been undertaken on a long term solution on the basis of proposals put forward by various members of the Inclusive Framework on BEPS.

7

*Ali Kennedy, Vice President of Group Tax at Sophos Group*, stated her support for the OECD work on a long-term solution to the tax challenges arising from digitalisation and stressed the need to update the tax system to deal with the fourth industrial revolution. However, she highlighted that the principle of taxing profits (rather than turnover) should be adhered to and that profits should be taxed only once. Ms Kennedy also noted the weaknesses of a user contribution/participation approach given the inability to accurately measure economic activity by counting users or online activity. She noted the ease with which users can mask and change their location or identity on the web (e.g. through use of different VPNs) and how challenging these issues would be to solve even on a purely technical basis.

*Gaël Perraud, Deputy Director of International Taxation and European Affairs at the French Ministry of Economics and Finance and Co-Chair of the OECD Task Force on the Digital Economy*, highlighted France's support for the OECD work in this area. Their main concern is to ensure fairness between digital firms and their traditional competitors who might be less able to take advantage of digitalisation to reduce tax payments. As a result, France considers it important to act now, even if it means adopting interim measures. Mr Perraud argued that the close ties to the single market mean that in his opinion this issue should be addressed at the European level and not unilaterally. He disagreed with Ms Kennedy that a reasonable approach to measuring user contribution could not be found. He stressed that support for the digital services tax proposed by the European Commission is not inconsistent with working within the OECD towards a long-term solution. He noted the new dynamic among countries to find a long-term solution

*Anna Milanez, Economist at OECD Centre for Tax Policy and Administration*, presented new work on the impacts of tax systems on incentives to employ non-standard workers instead of standard workers. By treating non-standard workers differently from standard employees, tax systems create arbitrage opportunities for firms in the types of contracts offered to workers and for individuals in their choice of organisational form. The analytical work, which covered eight countries, compares incentives to choose specific types of contracts. The results show that in some countries there are significant incentives for firms to shift away from standard employment created by the unequal tax treatment of these types of employment.

Following the panel discussion and presentations, questions were raised from participants regarding the choice of a turnover tax as an interim measure, what changes would need to be made to tax treaties to modernise the tax system, and about the role that platforms play in hiring labour.

### **Session 6 – International Trade in the Digital Era**

The digital transformation is fundamentally changing what and how we trade. This session gathered the views of international organisations, governments and businesses, on the issues that the digital transformation raises for trade, including reductions in cost, trade facilitation, trade in data, de minimis rules, and more broadly, the new opportunities offered. The panel agreed that there is need for more global dialogue across policy silos to find solutions to existing challenges arising from digital trade.

*Julia Nielson, Head of the Emerging Policy Issues Division, OECD Trade and Agriculture Directorate* opened the discussion by providing some background remarks on the evolving environment. She argued that digitalisation is blurring traditional distinctions between goods and services, and the borders these cross, making it more difficult to identify the specific rules that apply to specific transactions. Ms Nielson also noted that data underpins trade, whether directly or indirectly, so measures that restrict its flow can have trade consequences. Such measures are motivated by regulatory concerns (such as audit), industrial policy, privacy concerns or national security issues and can affect different types of data. We need to better understand impact on ability to trade and avoid a patchwork of approaches she argued.

*Bob Koopman, Chief Economist of the World Trade Organisation (WTO)*, then presented the recent World Trade report that sought to understand how digitalisation is transforming global commerce. The work combined a gravity model and a computable general equilibrium approach to identify how trade cost reductions arising from digitalisation translate into changes in trade. This work found that digitalisation will bring about a dramatic reduction in trade costs which will benefit SMEs and developing countries particularly, and more generally will increase trade, with more services available and more mass customisation.

*Harry Lee, Deputy Director Trade and International, Department for Digital, Culture, Media & Sport (United Kingdom)* highlighted that it is an exciting time to be working on digital trade, with the scale of global opportunities dramatically increasing. He noted that the United Kingdom hosts a dynamic and vibrant digital sector and that the benefits of digital trade can be widespread and inclusive, in terms of both nations and businesses. The United Kingdom continues to support this growth,

*Tilmann Kupfer, Vice President, Trade and International Affairs, BT Group* underscored the importance of data at all stages of the value chain and highlighted that many networks are intra firm. He also offered some policy recommendations such as focusing on B2B and GATS+ or CPTPP+ provisions; reductions to FDI restrictions; interoperable data flow disciplines; better public procurement rules for ICT services; reduction in service sector barriers, particularly those that are transversal (logistics, banking, transport, insurance); and the permanence of the e-commerce moratorium.

There was lively discussion after the presentations. Questions were raised as to the evidence base and different approaches used for analytical purposes, comparing reports from the WBG ‘trouble in the making’ report with the findings from the WTO report. There was a discussion on evidence about on-shoring and new trends in global value chains, as well as wage and employment impacts. However, most of the discussions focused on data flows. Whether a fundamental right or not, it was argued that standards on data protection should not be insensitive to business issues, even if this raises difficult questions. The debate also touched on the role of trade policy in promoting greater interoperability between different approaches and the need for regulators to identify what is or is not reasonable to meet stated policy objectives.

### **Session 7 – Policy discussion, summing up and close**

In this closing session, panellists agreed that the pace of digital technology trends has increased so much that policy makers do not have time to create and adopt new policies or modify existing ones. This paradigm shift is creating challenges across public policies from trade, to tax to competition. Governments need to support transformation but they are generally falling behind due to an inability

to attract talent and general competency (with exceptions in Estonia, Singapore and even China). A whole-of-government approach is required and silos will need to be broken down, to ensure the correct investments are made. The OECD's Going Digital project is helpful to governments providing analysis, research and recommendations.

The panellists also agreed that digital skills do not come naturally. There is a lot of talk about training and reskilling workforces but there are very few policy evaluations of training courses, their design and quality.

© OECD 2018

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

[www.oecd.org/going-digital](http://www.oecd.org/going-digital) - [goingdigital@oecd.org](mailto:goingdigital@oecd.org) -  @OECDInnovation - #GoingDigital - <http://oe.cd/stinews>  
<http://www.oecd.org/going-digital/conference-implications-of-digital-transformation-for-the-business-sector.htm>