Research Institute of Economy, Trade and Industry (RIETI)



RIETI BBL Seminar Handout

"Going Digital – Implications for Productivity and Jobs"

March 7, 2018 Speaker: Dr. Dirk PILAT

https://www.rieti.go.jp/jp/index.html

GOING DIGITAL – IMPLICATIONS FOR PRODUCTIVITY AND JOBS

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Outline



- 1. The Digital Transformation
- 2. OECD Going Digital Project The project
- 3. Some preliminary insights on productivity
- 4. Jobs and skills
- 5. Some conclusions

1. We are in a <u>new phase</u> of the digital transformation. ...



... with a wide range of new digital technologies emerging ...



Cloud computing







Artificial intelligence



3D printing



..., that provide opportunities for all parts of the economy



Public Admin.



Health



Retail



Agriculture



Science & Education

Digitalisation





Manufacturing



But we need a more strategic and pro-active approach to digitalisation

- Critical thresholds have been crossed
- Shift from an economic focus to socio-economic; all sectors of the economy are now affected
- Huge potential for better services and better lives
- But realisation that digitally induced change will be disruptive for many people, firms and sectors.
- In many countries, a gap between Technology (4.0), and Policy (1.5 or 2.0)

OECD Going Digital Project, ...

Horizontal initiative across the OECD (involving all key policy areas), mandated by Ministers, to:

- 1. Understand the digital transformation and its impacts on the economy and society;
- Provide policy makers with the tools needed to develop a pro-active, whole-of-government policy response;
- 3. Help overcome the gap between technology and policy development.

... based on an integrated policy framework ...



..., work across the OECD focused on the main policy questions ...

- Over 80 projects, including more than 70 reports and 15 workshops
- Projects reflect the range of policy domains participating in the project, e.g.:





... and in-depth work on some key policy questions



Jobs, skills and the nature of work





Well-being & inclusion



Measurement

3. Productivity growth has slowed down in much of the world

Annualised growth of labour productivity (output per person employed)



Source: OECD estimations based on Conference Board, Total Economy Database, Regional Aggregates, May 2017.

The slowdown has ignited a spirited debate

T-Pessimists:

- Gordon
- Cowen
- Thiel



T-Optimists:

- Brynjolfsson
- McAfee
- Mokyr
- Jovanovic



Despite the slowdown, the most productive firms still manage rapid productivity growth



Note: "Frontier firms" is the average labour productivity (value added per worker) of the 100 or 5% globally most productive firms in each two-digit industry. "Non-frontier firms" is the average of all firms, except the 5% globally most productive firms. Source: OECD preliminary results based on Andrews, D., C. Criscuolo and P. Gal (2016), "Mind the Gap: Productivity Divergence between the Global Frontier and Laggard Firms", OECD Productivity Working Papers, forthcoming; Orbis database of Bureau van Dijk.

While most firms are connected, but few make effective use of advanced ICT ...

Diffusion of selected ICT tools and activities in enterprises, OECD countries, 2010 and 2016

As a percentage of enterprises in each employment size class



Source: OECD Science, Technology and Industry Scoreboard 2017, StatLink: <u>http://dx.doi.org/10.1787/888933619600</u>

... and SMEs are lagging, even in technologies well suited to them

Enterprises using cloud computing services, by firm size, 2016

As a percentage of enterprises in each employment size class



Source: OECD Digital Economy Outlook 2017, StatLink: http://dx.doi.org/10.1787/888933585495

There are also still large differences in digital intensity by industry

Taxonomy of sectors by quartile of digital intensity, 2013-15



Source: OECD, OECD Science, Technology and Industry Scoreboard 2017, OECD Publishing, Paris.

Some thoughts on the **future of productivity**

- The **diffusion** of advanced digital technologies (e.g. big data, robotics, AI) in OECD countries is still underway it will take time, especially for SMEs, and for certain sectors.
- It's never just about technology diffusion changes in organisations, business models, worker's skills and processes will take even more time.
- The impacts of digital technologies will also require much **structural change within industries**, as digitally-intensive firms grow and less digitally-intensive firms decline.
- **Policy can help**, e.g. by fostering investment and technology diffusion, strengthening skills, facilitating structural change, and ensuring sound competition.

4. Jobs: The 3 mega-trends

Technology is changing the workplace

Estimated worldwide annual supply of industrial robots



The world has become more integrated





Populations are ageing

Old-age dependency ratio 65+/(15-64) OECD average



Labour markets are changing





Labour markets are polarising

Percentage point change in share of total employment

(OECD average), 1995 to 2015

New forms of work are emerging





Richest 10% v. poorest 10%



New OECD estimates suggest that the **risk of automation** is (likely) smaller than thought ...

SHARE OF JOBS AT **SIGNIFICANT RISK (50-70%)** AND OF **HIGH RISK** (>70%) OF AUTOMATION, BY COUNTRY, %



Source: OECD, forthcoming.



Source: Wall Street Journal, "Workers, fear not the Apocalypse", 5 September 2017

But there is a **polarisation** in skill demands ...

Job polarisation in major OECD economies, 2002-14 Percentage points changes in employment shares by occupation



Source: OECD estimates based on EU-LFS, Japanese Labour Force Survey, BLS Current Population Survey.

... and new skills that will be needed, ...

Individuals who judge their computer skills to be sufficient if they were to apply for a new job within a year, 2013 (as a percentage of all individuals)



Source: OECD Measuring the Digital Economy: A New Perspective, 2014, http://dx.doi.org/10.1787/888933148354.

... as too few have the skills for a technologyrich environment

Workers using office productivity software at work every day

As a percentage of total population



Source: OECD Digital Economy Outlook 2017, StatLink: http://dx.doi.org/10.1787/888933585951

In the era of AI, the risk of automation is highest for low-skilled low-paid workers



Highest risk in **routine jobs** with low skill and education requirement BUT low risk applies to a broad range from **professionals to social workers**



Automation mostly affects manufacturing industry and agriculture BUT some service sectors are highly automatable too.



The risk of automation also falls with **educational attainment**



No evidence of **polarisation or rising risk at the high end**: automation risk declines with skills, education and hourly wages



The risk of automation falls monotonically with **hourly** wages



Young people are the most at risk of automation, followed by older workers, with disappearing student jobs and entry positions.

Older workers face a particular challenge

Share of 25-34 and 55-64 year-olds performing at Level 2 or 3 in Problem Solving in Technology-Rich Environments, 2012



Source: OECD (2015e), Survey of Adult Skills (PIAAC) (2015).

There may also be **gender differences** in the impact of automation



Source: OECD Secretariat calculations based on the Survey of Adult Skills (PIAAC, 2012, 2015) and Arntz et al. (2016).

Not all workers have the foundations to easily continue learning ...

The proportion of low performers in literacy and/or numeracy, workers



Source: OECD calculations based on the Survey of Adult Skills (PIAAC) (2012 and 2015), www.oecd.org/skills/piaac/publicdataandanalysis .



Percent of working population participating in job-related education and training during the last year by level of proficiency in literacy



Source: OECD (2013), OECD Skills Outlook 2013: First Results from the Survey of Adult Skills , OECD Publishing.

Share of non-routine employment and ICT task intensity, 2012 or 2015

Correlation of average industry values in manufacturing



Economies where workers use ICT more intensively at work are also characterised by a higher share of "non-routine jobs". These jobs entail the performance of relatively more complex tasks that cannot be easily codified or sequenced

Source: OECD Science, Technology and Industry Scoreboard 2017, StatLink: http://dx.doi.org/10.1787/888933617586

Key issues for policy



Skills. Lifelong learning: from rhetoric to reality.

Regulation. Balancing flexibility with security.



Social protection. Repairing or replacing the safety net?



Social dialogue. Rebuilding or reinventing?

5. Next on the Going Digital Project

- Interim report for OECD Ministerial (30-31 May) under development
- Wide range of stand-alone policy reports being prepared, e.g. on jobs, productivity, wellbeing, ...
- Final synthesis report at the end of the project high-level closing conference planned for <u>11-12 March 2019</u>
- Range of flagship reports that will focus on digitalisation and impacts on jobs and skills, e.g. 2019 OECD Employment Outlook and 2019 Skills Outlook
- Beyond the book:
 - Roundtables and national discussions with policy makers and stakeholders – to help countries develop more pro-active national digital strategies
 - Work towards a Going Digital toolkit that will provide tools and good policy practices for the digital age
 - OECD national reviews of digital transformation to come pilot reviews underway in Sweden and Colombia



OECD Going Digital website: http://www.oecd.org/going-digital

Sign up to our newsletter: www.oecd.org/sti/news.htm