

New Technologies and the Shrinking Work Force

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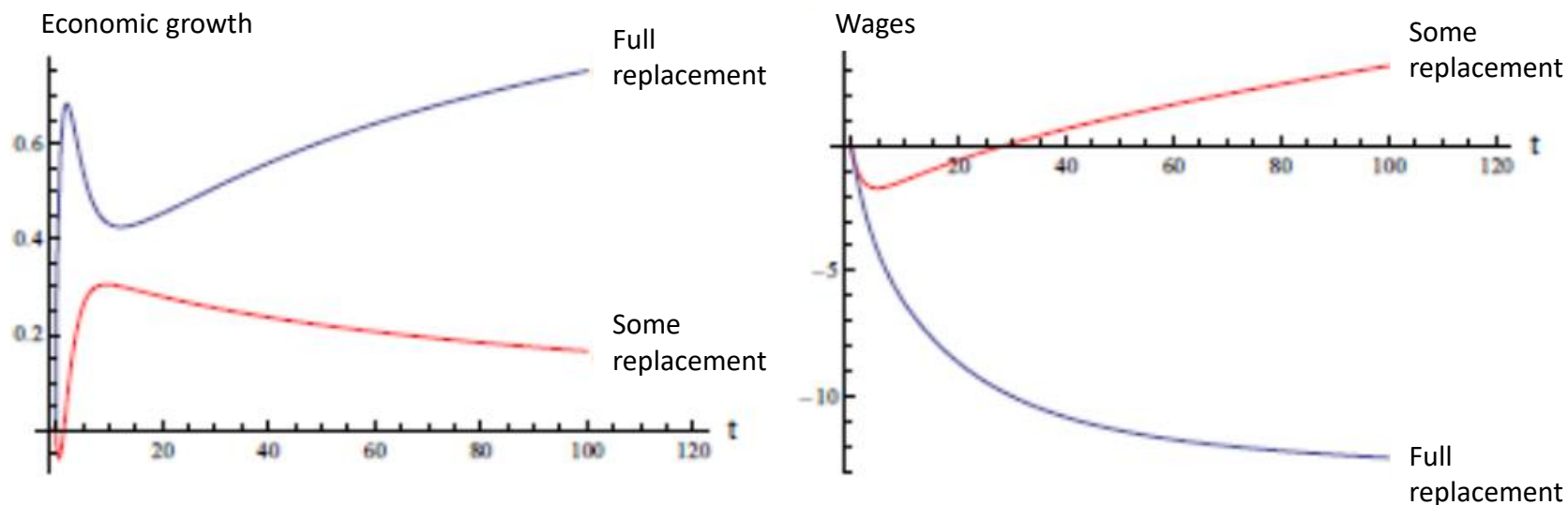
ETLA 6.6.2019

New technologies

- Destruct current human tasks (unemployment)
- Create new tasks for humans (new jobs)
- Decrease relative price of human work (more demand for humans)

- Improve productivity (higher profits and wages)

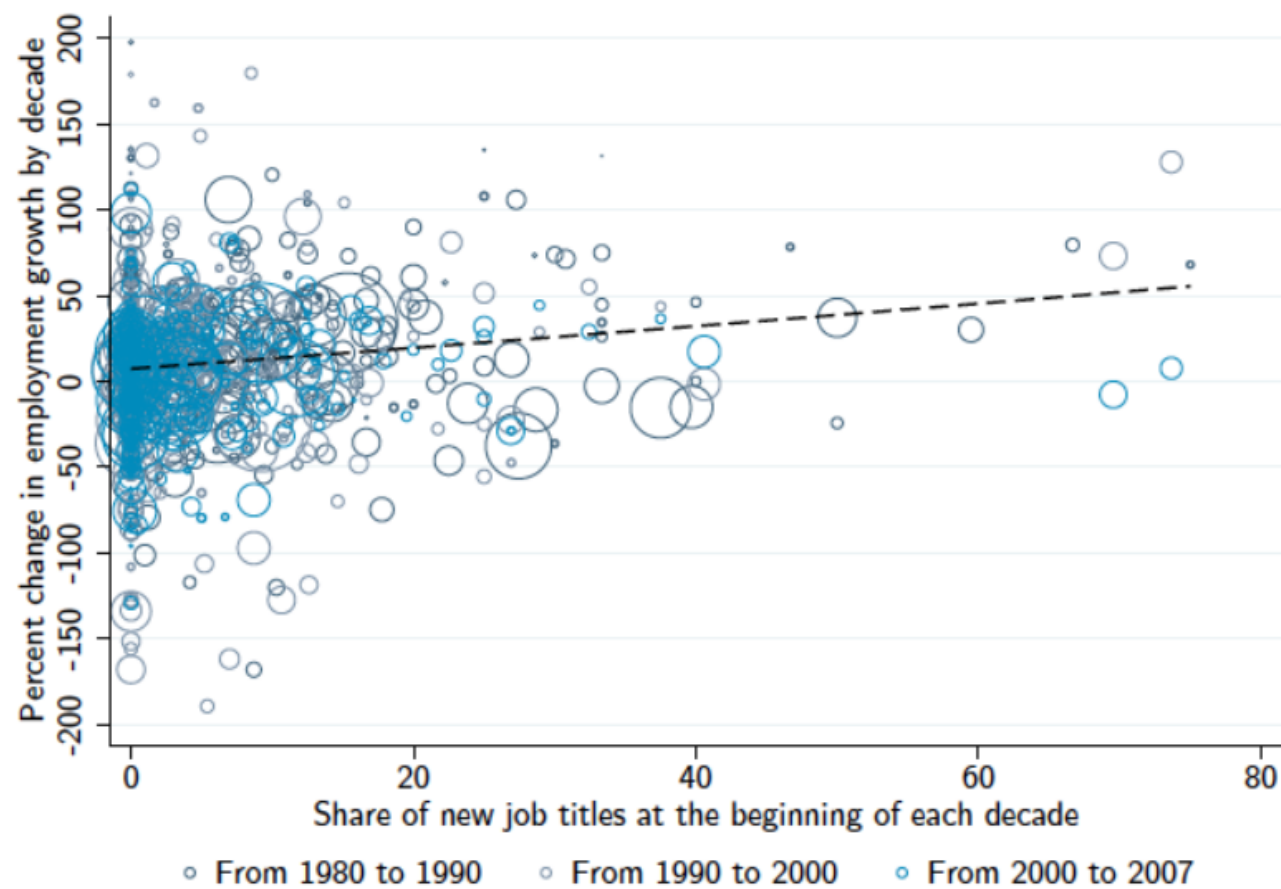
Which direction technology evolves?



Notes: Transition paths for the growth rate and the real wage for Model 1 when robots and labor are perfect vs imperfect substitutes.

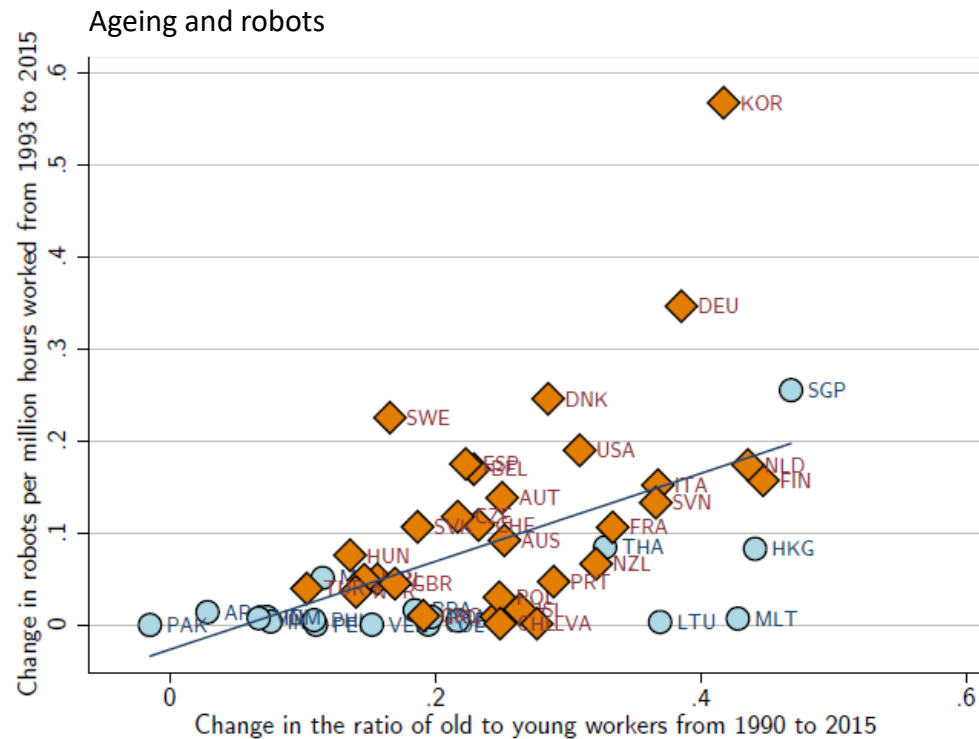
Berg ym. (2017).

Development so far



Acemoglu ja Restrepo (2016).

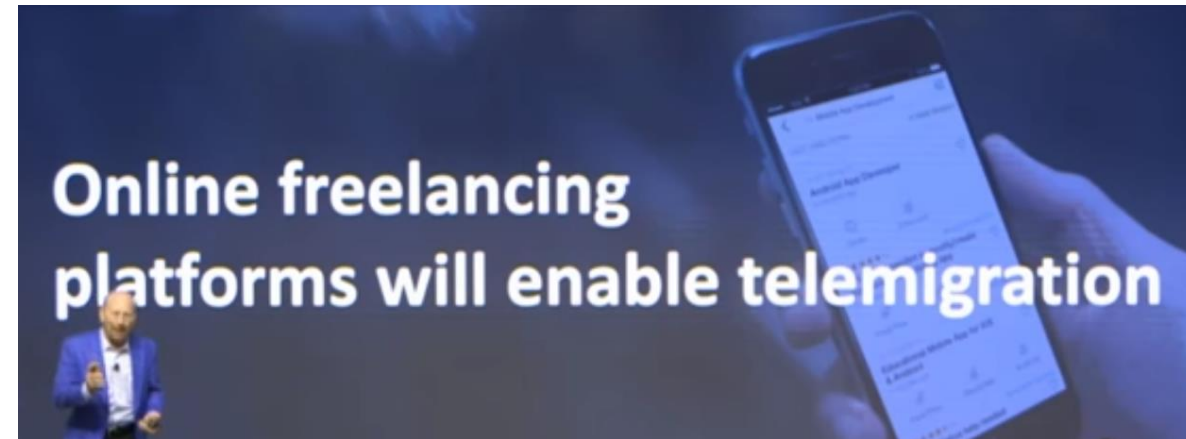
New technologies and ageing societies



Acemoglu ja Restrepo (2017).

More "Help" from Globalisation

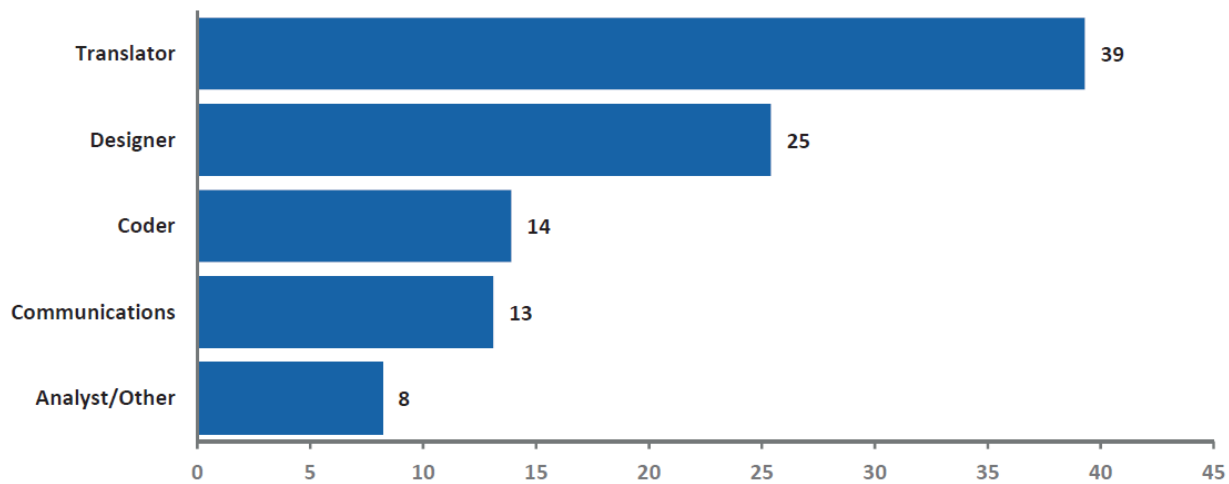
- From things we make, to things we do (services)
- Huge wage differences between service sector workers
- Machine translation will break down language barriers
- Telemigration: people sitting in one nation can work in offices in another nation



Baldwin (2019).

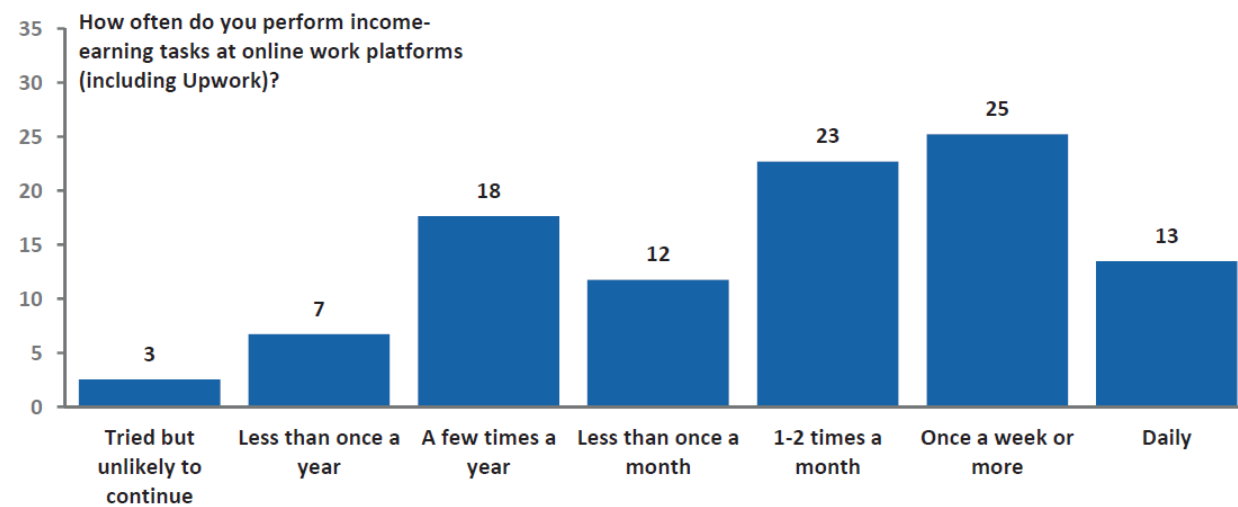
Upworkers in Finland

Figure 2 Percentage shares of respondents' primary occupations based on their public *Upwork* profiles



Source: The authors' assessment based on workers' descriptions in *Upwork*, December 2017.

Figure 7 Respondents' frequency of performing income-earning tasks on online platforms

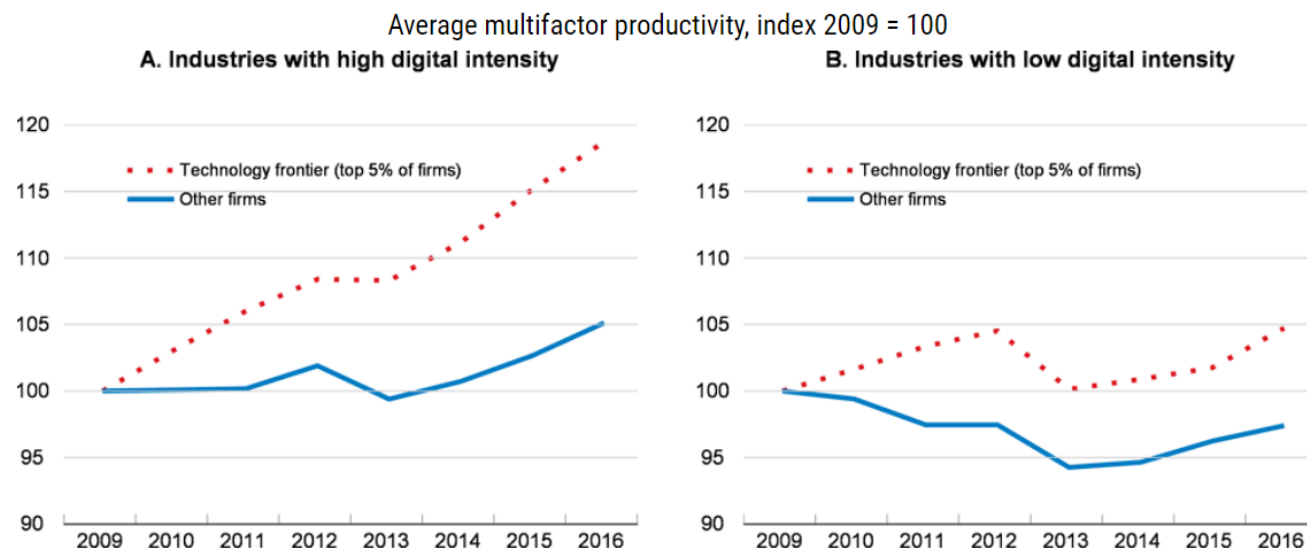


Source: *Upworkers in Finland* survey, December 2017.

ETLA (2017).

Digital intensity and productivity

Figure 2.2. Productivity dispersion across firms has increased, especially in digital intensive sectors



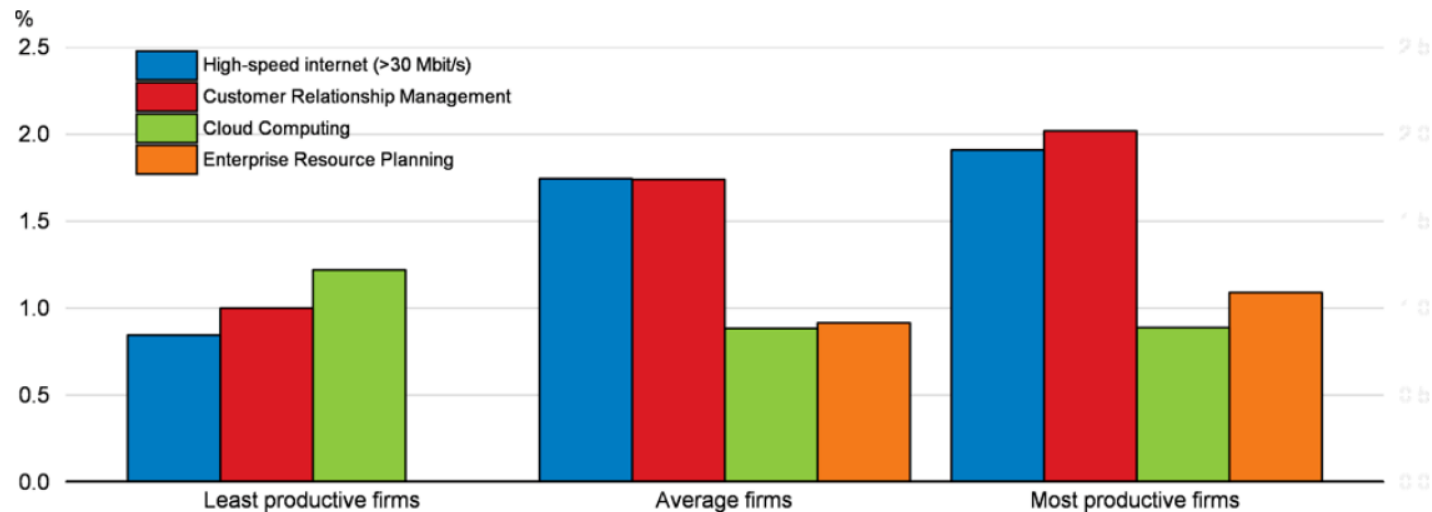
Note: The “technology frontier” is measured by the three-year moving average of log multifactor productivity, based on the Wooldridge (2009) methodology, on average among the top 5% of companies across 25 OECD countries, i.e. those with the highest productivity levels, in each 2-digit industry (among manufacturing and market service industries, excluding finance) and in each year. The “other firms” lines correspond to the average of the same variable among all firms excluding the top 5% in each industry and year. Industries are classified either as having “high” or “low” digital intensities based on the methodology in Calvino, F. et al. (2018), “A Taxonomy of Digital Intensive Sectors”, *OECD Science, Technology and Industry Working Papers*, No. 2018/14, OECD Publishing, Paris.

Source: OECD calculations using Orbis data, following the methodology in D. Andrews, C. Criscuolo and P. Gal (2016), “The Best Versus the Rest: The Global Productivity Slowdown, Divergence Across Firms and the Role of Public Policy”, *OECD Productivity Working Papers*, No. 5, OECD Publishing, Paris.

Self-enforcing process

Figure 2.8. **More productive firms have benefitted more from digitalisation**

Firm-level increase in multifactor productivity associated with an increase in the industry-level adoption rate of selected digital technologies by 10 percentage points



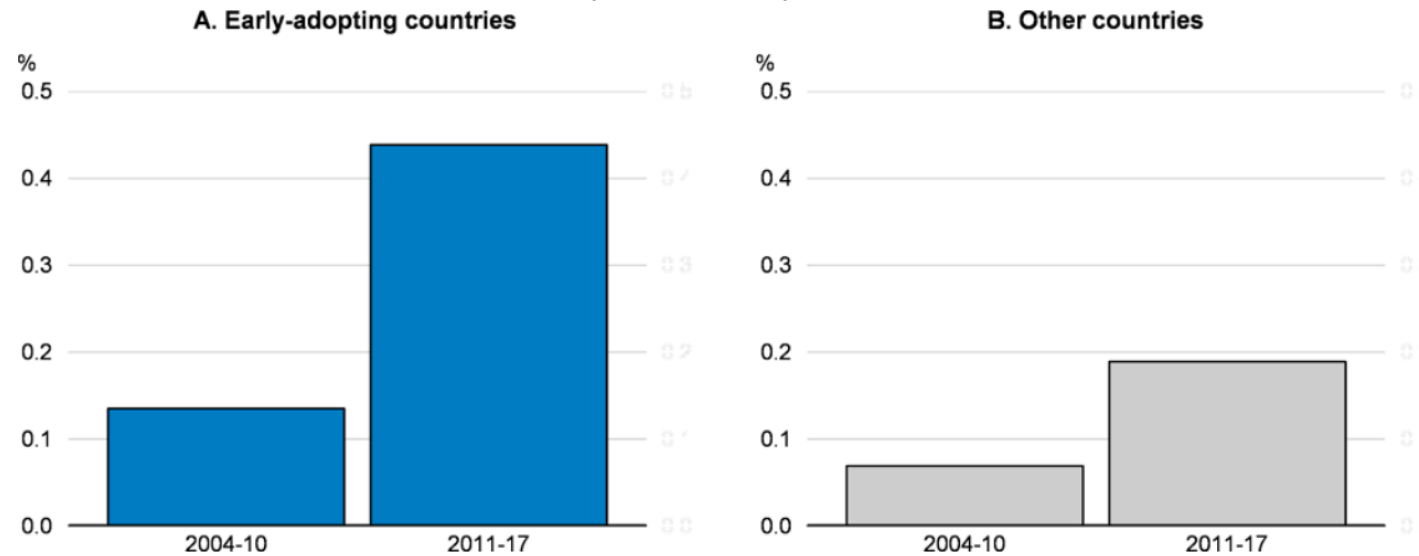
Note: “Least productive firms” corresponds to the first quartile of the productivity distribution in each industry-country-year cell, “average firms” to the second and third quartiles and “most productive firms” to the fourth quartile. Results for Enterprise Resource Planning for the least productive firms are omitted since they are not statistically significant. Effects are estimated over 2010-15 for EU firms with at least ten employees. The only technology for which less productive firms benefit more than more productive ones is cloud computing, which may reflect that it requires less complementary investments in organisation and skills.

Source: Gal, P., G. Nicoletti, S. Sorbe and C. Timiliotis (2019), “Digitalisation and Productivity: In Search of the Holy Grail – Firm-Level Empirical Evidence from EU Countries”, *OECD Economics Department Working Papers*, No. 1533, OECD Publishing, Paris.

You need to be fast

Figure 2.7. **Online platforms can enhance the productivity of service firms**

Annual gain in multifactor productivity of the average firm in selected service industries associated with online platform development

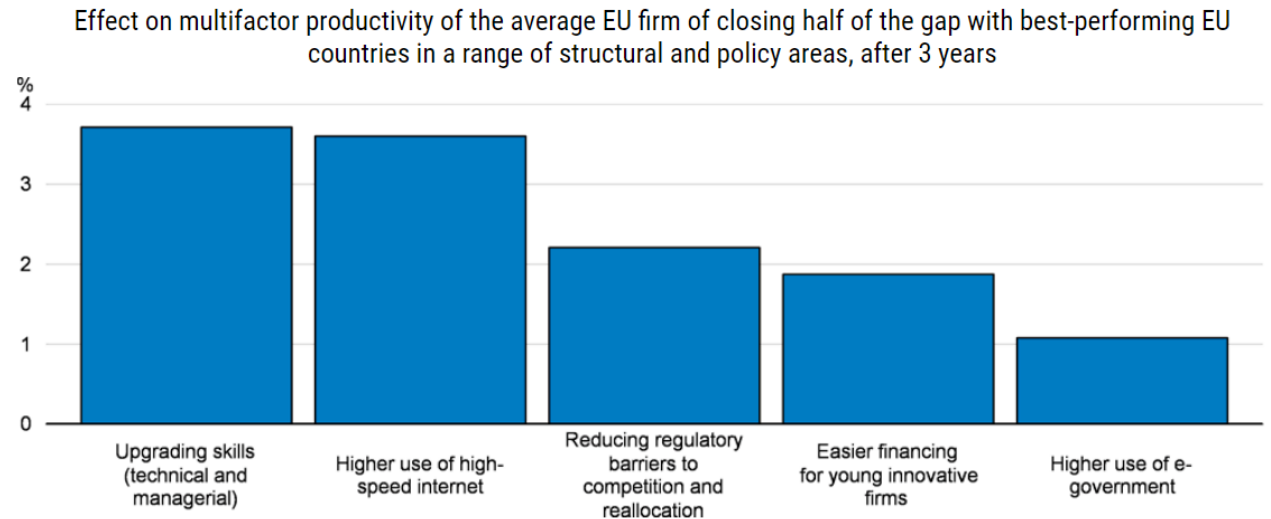


Note: “Early-adopting countries” is the average of the five countries in the sample where the platform development indicator is above median on average over the 2004-17 period (France, Italy, Spain, the United Kingdom and the United States), while “other countries” is the average of the five other countries in the sample (Belgium, Germany, Hungary, Poland and Sweden). The figures are unweighted averages of the effects across four selected industries (hotels, restaurants, taxis, retail trade).

Source: Bailin, A., P. Gal, V. Millot and S. Sorbe (2019), “Like It or Not? The Impact of Online Platforms on the Productivity of Service Providers”, *OECD Economics Department Working Papers*, No. 1548, OECD Publishing, Paris.

What late-coming countries could do?

Figure 2.9. **A range of policies can support productivity by promoting greater diffusion of digital technologies**

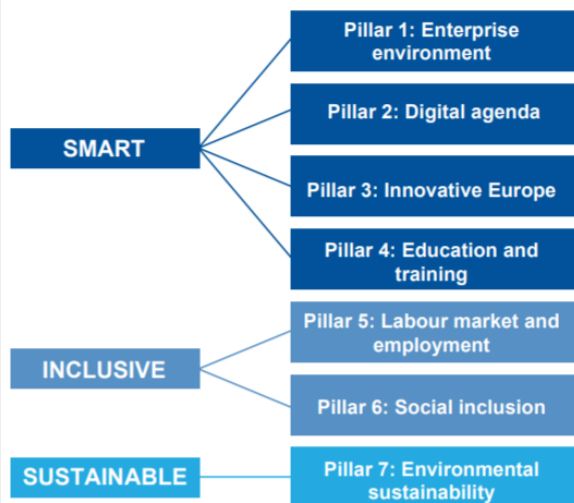


Note: The effects correspond to the estimated productivity gains associated with greater diffusion of high-speed internet, cloud computing, and Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) software resulting from closing half of the gap with best EU countries in a range of structural and policy areas. "Upgrading skills" covers participation in training (for both high and low-skilled), quality of management schools and adoption of High Performance Work Practices (HPWP). "Reducing regulatory barriers to competition and reallocation" includes lowering administrative barriers to start-ups, relaxing labour protection on regular contracts and enhancing insolvency regimes. "Easier financing for young innovative firms" covers the development of venture capital markets and the generosity of R&D tax subsidies. Structural and policy indicators are measured circa 2016. The detailed description of the sub-indicators used and the best-performing EU country for each sub-indicator can be found in Annex B of Sorbe et al. (2019).

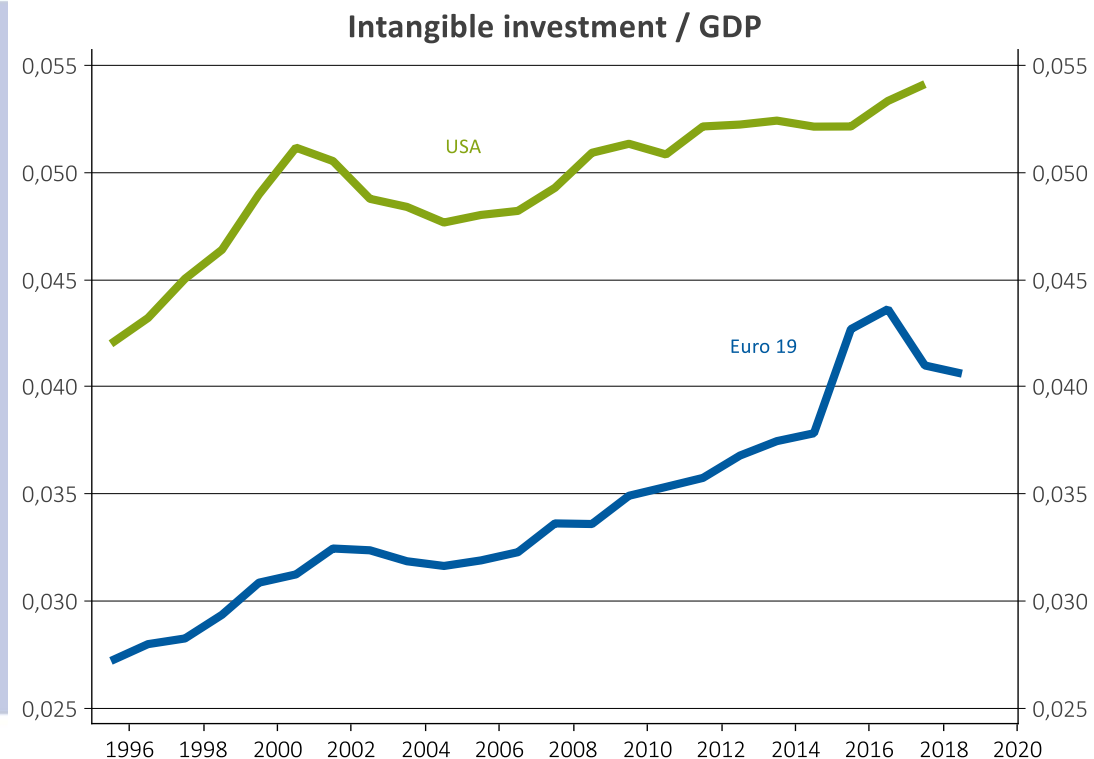
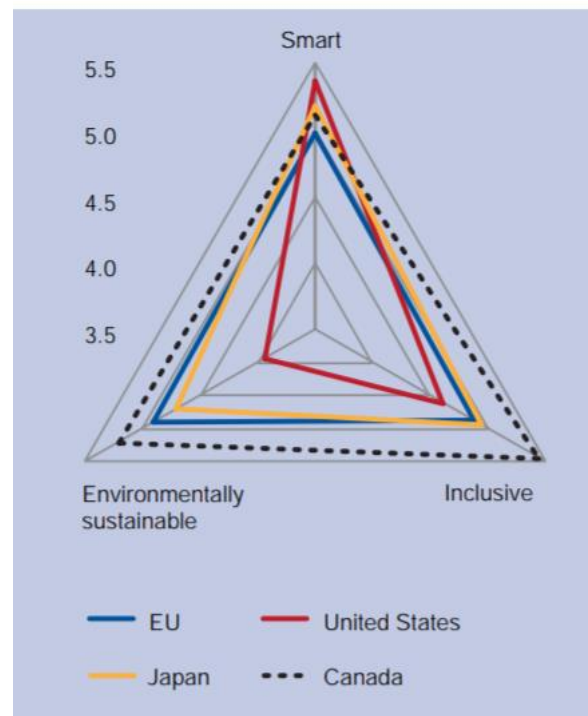
Source: Sorbe, S. et al. (2019), "Digital Dividend: Policies to Harness the Productivity Potential of Digital Technologies", *OECD Economic Policy Papers*, No. 26, OECD Publishing, Paris.

What Europe should do?

Figure 2: "Europe 2020" Competitiveness Report Framework

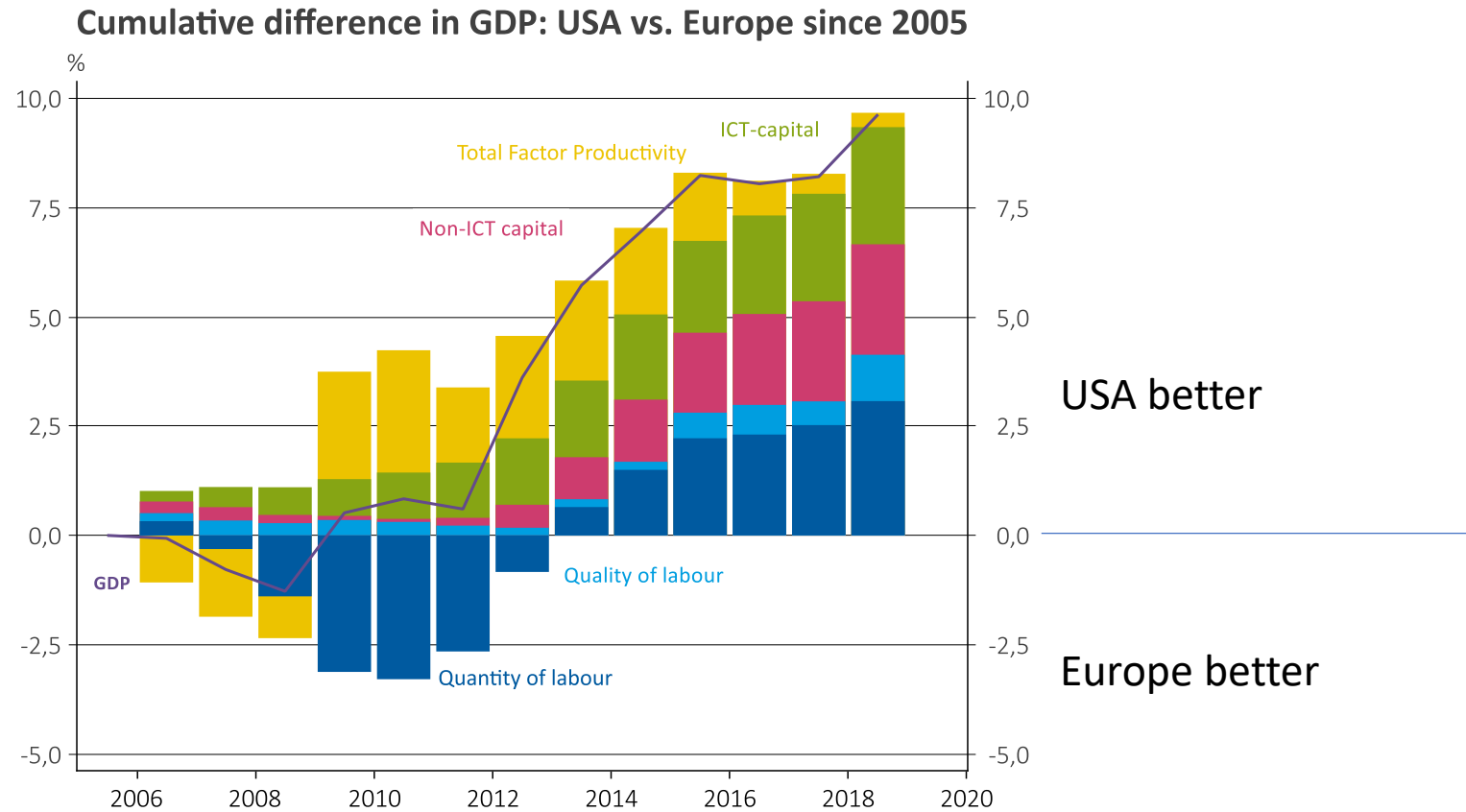


Source: World Economic Forum



Lähde: OECD via Macrobond

Europe needs all sorts of investments



Lähde: ETLA, TCB, Eurostat via Macrobond