

IARIW-ESCoE Conference

“Measuring Intangible Assets and Their Contribution to Growth”

The role of intangibles for productivity dispersion

Alexander Himbert, OECD, alexander.himbert@oecd.org

Carol Corrado, The Conference Board

Chiara Criscuolo, OECD

Jonathan Haskel, Imperial College and the Bank of England

Cecilia Jona-Lasinio, ISTAT and LUISS University

Abstract

This paper presents new evidence on the impact of intangible capital on productivity dispersion within industries. Starting from the observation that the rise in productivity dispersion after 2000 is more pronounced in intangible-intensive industries, the report analyses the link between intangible capital intensity and productivity dispersion both at the top and at the bottom of the productivity distribution, and in different industries. The results suggest that industries that have experienced a stronger increase in intangible investment have also seen a steeper increase in productivity dispersion both at the top and at the bottom of the productivity distribution. While the results at the top seem to be associated with the scalability of intangible capital, which is likely to disproportionately benefit high productivity firms and incumbents, dispersion at the bottom is rather linked to complementarities between intangible investment and factors like digital intensity, trade openness and venture capital.

Summary

The last two decades have been characterized by a slowdown in productivity growth and a simultaneous increase in productivity dispersion between firms. At the same time, intangible assets, such as data, proprietary software and human and organizational capital have been increasingly recognized as key drivers of productivity growth. At the same time intangible capital has also been put forward as one potential factor contributing to the increasing productivity dispersion between firms within industries.

This report contributes to this discussion by combining cross country data on productivity dispersion within industries with cross-country data on sectoral level intangible investment. This novel data allows for the first time, a detailed analysis of intangible investment as a driver of productivity dispersion and implications for policies for ten countries.

The report provides several key takeaways:

(i) First, industries with higher levels of intangible investment experienced higher increases in productivity dispersion between firms. On average, in the preferred specification, an increase in intangible investment of 10 percentage points is linked to an approximately 1.5 percentage point increase in productivity dispersion. While the identification strategy does not allow to establish causality, the correlation between intangible investment and productivity dispersion is

robust to controlling for average firm size, proxied by either average gross output, capital or labor input, and for capital intensity and to controlling for the dispersion in these respective measures, as well as to different specifications of fixed effects, different definitions of productivity dispersion and separate analysis of individual macro sectors.

(ii) Second, the divergence between frontier firms and the median firm in an industry can at least in part be attributed to the scalability nature of intangibles, as the link between dispersion at the top (i.e. between firms at the 90th percentile and the median) and intangibles is stronger in industries where differences in sales across firms are larger.

(iii) Third, the estimates suggest that the diffusion of digital technologies to the least productive firms within industries is harder the higher the intangible intensity of the sector considered and intangible investment is found to be linked to a significant increase in the productivity dispersion at the bottom (i.e. between firms at the 10th percentile and the median firm within an industry). These results point to the existence of complementarities between intangible assets and digital technologies: as digital technologies necessitate complementary investments in intangibles, laggard firms - which are unable to carry out the necessary intangible investment - fall behind in digital intensive sectors.

Finally, and importantly for policy makers, the results presented in this report suggest that the link between intangibles and productivity dispersion varies significantly across sectors and countries, along different structural characteristics such as digital intensity, trade openness and availability of finance (e.g. venture capital). This may offer valuable evidence based insights into potential areas for policies aiming at alleviating lags in diffusion and enhance productivity growth across the board.

Taken together, the results help identify several policy areas that have the potential to help lagging firms close the gap with leading firms by investing in intangible assets and benefitting from the adoption of new technologies. When designing policies aimed at improving productivity performance across the board, it is very important to both continue fostering the innovative activity of the most productive firms, and at the same time strengthening the ability of the economy to diffuse innovation to as many firms as possible. Indeed, the report's analysis suggest that policies that encourage intangible investment by laggard firms likely alleviate the heterogeneous gains from the digital transformation due to complementarities between intangibles and digital technologies, and could ensure that the benefits of the digital transformation are shared more widely.

This report fits into a larger agenda of policy analysis conducted which investigates the rising importance of intangible assets and their complementarities with digital technologies in modern globalized economies from different angles. Related research has shown that industries tend to become more concentrated as their intensity in intangible capital rises (Bajgar et al., 2019), tend to experience rising and diverging firm-level markups (Calligaris, Criscuolo and Marcolin, 2018) and sharper decline in entry rates (Calvino and Criscuolo, 2019).