



# How different types of investments support productivity growth?

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The summary is based on the survey “Do investments by enterprises reach productivity?” commissioned by the Foresight Centre.

The survey report is available at [www.riigikogu.ee/wpcms/wp-content/uploads/2017/09/Uuringuaruanne\\_Tootlikkus\\_ja\\_investeeringud\\_30052018.pdf](http://www.riigikogu.ee/wpcms/wp-content/uploads/2017/09/Uuringuaruanne_Tootlikkus_ja_investeeringud_30052018.pdf)

## Did you know?



### What is productivity?

Productivity refers to the efficiency of production, i.e. what is the production output achieved from a certain amount of production inputs. Consequently, productivity is expressed as a ratio of production outputs to inputs.

The most common productivity indicator is labour productivity, expressed as **the ratio of gross domestic product (GDP) to the number of hours worked**.

**The total factor productivity** takes into account different production inputs and strives to harness the growth that results from an improved quality of labour and capital inputs (workers with better education, updated machines, better management practices, economies of scale, brands, etc.).

### Productivity growth is slowing down

For Estonia, the speed of productivity growth might outweigh the current level of labour productivity. In 2001–2007, our labour productivity grew very quickly; but after the economic crisis, productivity growth has slowed both in absolute numbers (from six per cent to two) as well as in comparison with other countries.

### Different types of investments have a different impact on productivity

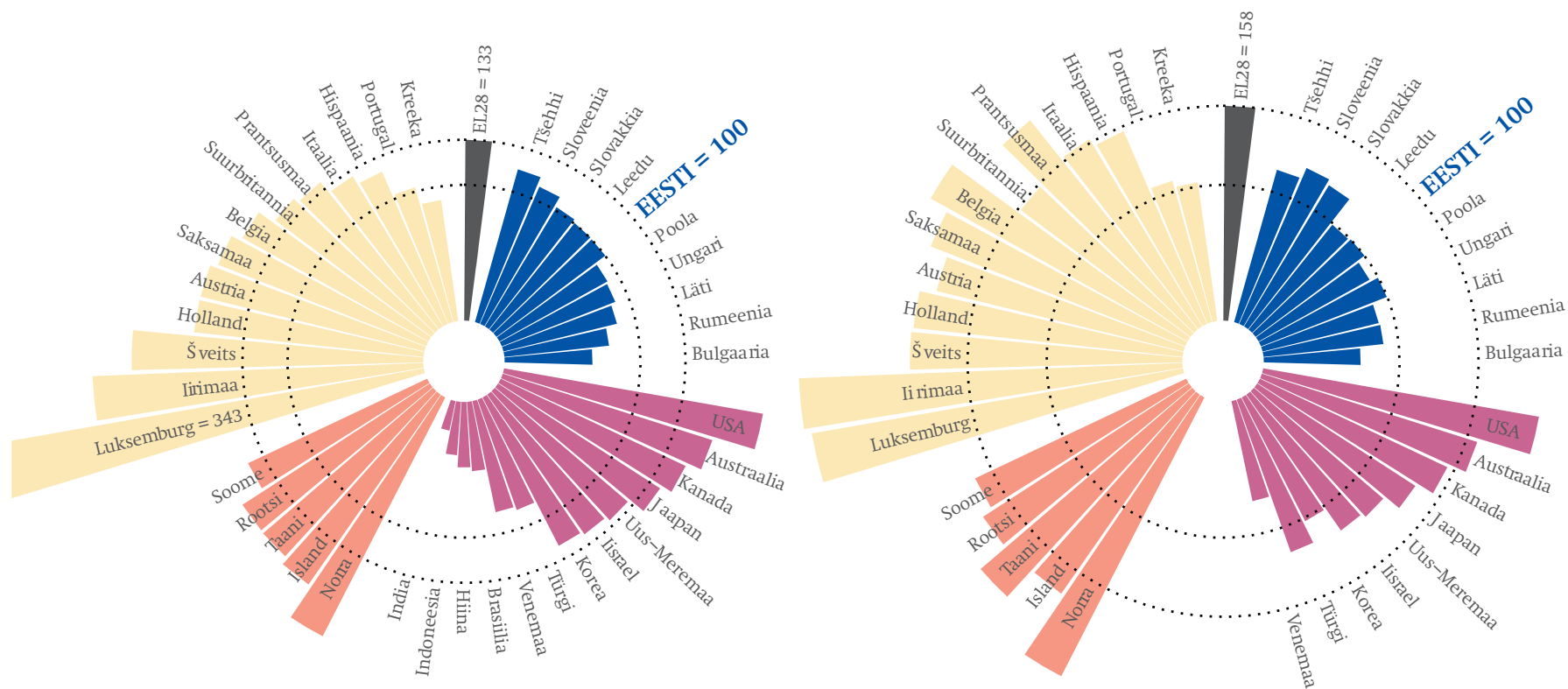
Investments in the expansion of tangible fixed assets increase the productivity only to a certain point, after which the quality, innovation and structure of investments will become important and there will be a need to invest in intangible assets.

Enterprises that wish to move to higher levels in the value chain must focus on investing in intangible assets. For such enterprises, the business environment becomes more important: market volume, stability of the economic and financial environment, diversification of funding possibilities and good functioning of the capital market, protection of intellectual property and general legal certainty.



The gap between Estonia and more developed countries is wider in productivity than in the overall living standards: in 2016, whereas Estonia's GDP per capita amounted to 75% of the GDP per capita of the EU Member States, the hourly productivity of the labour force in Estonia only reached 63% of the EU average.

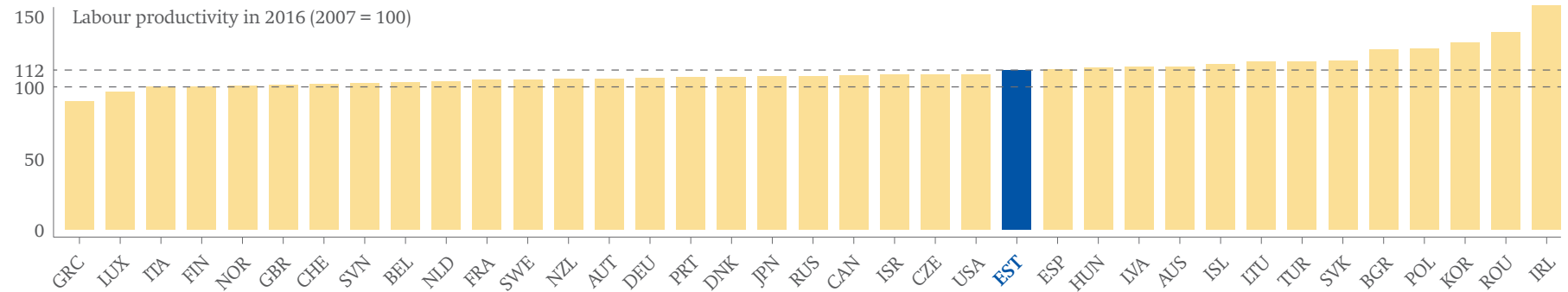
Fig. 1. Estonian GDP in PPP per capita (left) and labour productivity per hour worked (right) compared to selected countries in 2016





Countries that have increased productivity more than Estonia since 2007 include Hungary, Lithuania, Turkey, Slovakia, Bulgaria, Poland, South Korea, Romania, and Ireland.

Fig. 2. Labour productivity per hour worked in 2016 compared to 2007



Source: Authors' calculations based on the OECD Productivity Statistics Database

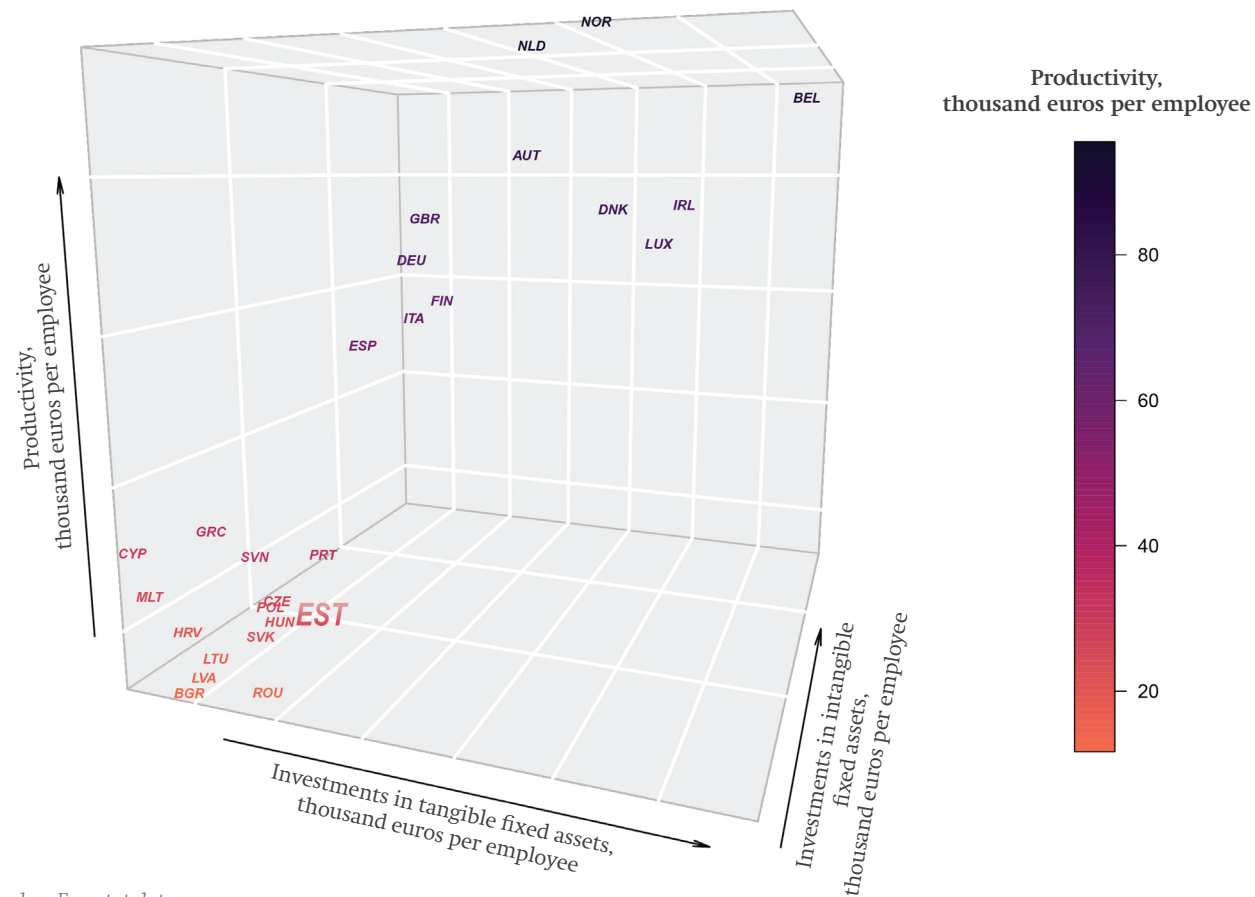
## Different types of investments have different impacts on productivity

- Depending on the level of economic development, economic growth is supported by a variety of factors. At an earlier stage in economic development, growth is driven by the accumulation of tangible fixed assets (machines, equipment and technology); in the next stage, the growth engine will be the wealth of knowledge and skills of the human capital; and at the higher development stages, growth is fuelled by innovation based on research and development.
- Investments in the expansion of tangible assets will only increase the productivity to a certain point, known by economists as the diminishing marginal productivity of capital. Furthermore, the quality, innovation and structure of investments will become essential, and there will be a need to invest in intangible assets, which include investments in design, financial innovation, advertising, market research, organizational capital, staff training, and research and development.



- If an enterprise wishes to grow, expand its market, export and develop an international brand so that it can move to higher levels in the value chain, the key will be investments in long-term and less liquid intangible assets, as well as the expectations to the business climate. Such enterprises will attach more importance to market volumes, stability of the economic and financial environment, diversification of funding options and good functioning of the capital market, protection of intellectual property, and wider legal certainty.

Fig. 3. Investments of European countries in tangible and intangible assets, productivity and exports in the industrial sector



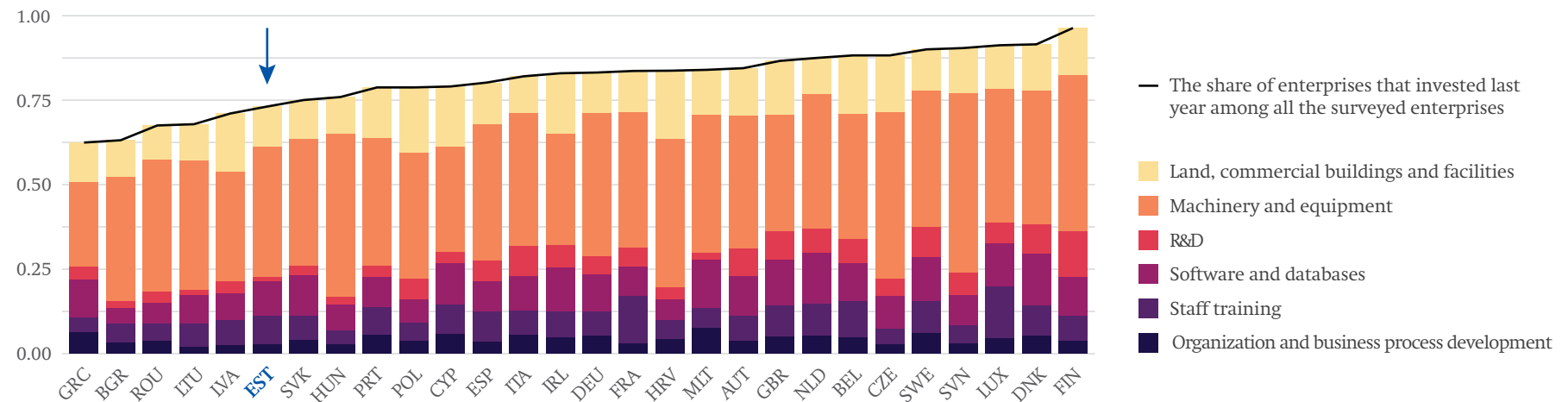
Source: Authors' calculations based on Eurostat data



## Estonia overinvests in machinery and equipment, and underinvests in people and R&D

- Compared to the EU average, the investments in intangible assets as share of the GDP are lower in Estonia, and investments in machinery and equipment are higher. In Estonian enterprises, 69% of investments go to machinery and equipment, land and premises, and the rest, i.e. less than one third, go to intangible assets. The EU average for intangible fixed assets is 37%.
- Highly productive Western European countries invest heavily in intangible assets, especially the Nordic countries like Norway, Denmark, and Finland. In Estonia, a large capital stock is invested in tangible fixed assets, but investments in intangible assets that support innovation remain significantly lower than in highly productive countries.
- Overinvestment in tangible fixed assets may be caused by a taxation system that favours capital investment and imposes additional burden on human resources, e.g. in the shape of high labour taxes, or that does not support R&D and innovation in the field of new products, services, and technologies. Similarly, the high proportion of investment in tangible assets can be attributed to the enterprises' dependency on borrowed capital, which means that the assets that are being invested in can be used as a collateral.

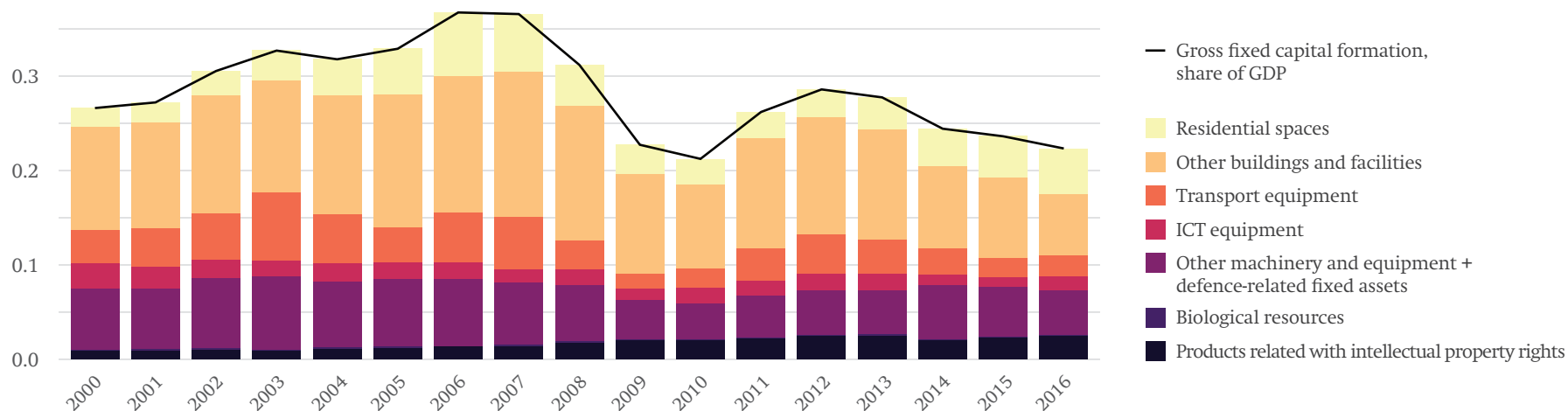
Fig. 4. The share of enterprises that invested in 2016 among all the surveyed enterprises, and the share of investment types



Source: Authors' calculations based on the EIB Investment Survey 2017 data



Fig. 5. Gross fixed capital formation and the share of types of investments in Estonia in 2000–2016



Source: Authors' calculations based on data from the OECD National Accounts Statistical Database

## Economic sectors differ by investment patterns

- In the comparison of economic sectors, Estonia is broadly similar to the rest of the EU: the largest investor in R&D is the manufacturing industry, while the share of software and databases is the largest in the field of services.
- While in 2015 the dominant majority of investments in Estonia were substitution investments, in 2016 there was a sharp rise in investments made for increasing production volumes. Both years, around half of all investments in the EU were substitute investments.
- Investments in increasing production volumes do not, in general, lead to investments in development and upgrading of workforce qualification. R&D investments are related to training employees, investing in software and databases, and developing the business organization and business processes.
- Regardless of the sector, the vast majority of digital technologies in the Estonian enterprises are technologies related to artificial intelligence, big data, smart technology and blockchain technologies, mainly due to the fact that the development of these technologies requires relatively little capital.
- In the manufacturing industry, higher investments in employee training lead to higher labour productivity. Productivity and investment in human capital are interdependent, i.e. the higher the quality of human capital, the higher the productivity, and the higher the productivity, the greater the ability to invest further in the development of human capital.



## Exports play an important role in productivity growth

- In productivity growth, important factors include intra-enterprise growth factors such as innovation, R&D and training of employees, as well as external growth factors – learning-by-exporting, available supply of value added inputs (human capital and financing), and value-added economic environment (legal certainty, competition, tax incentives for R&D and innovation).
- Learning from exporting is regarded as a process of increasing productivity, where exporters acquire new knowledge, technologies

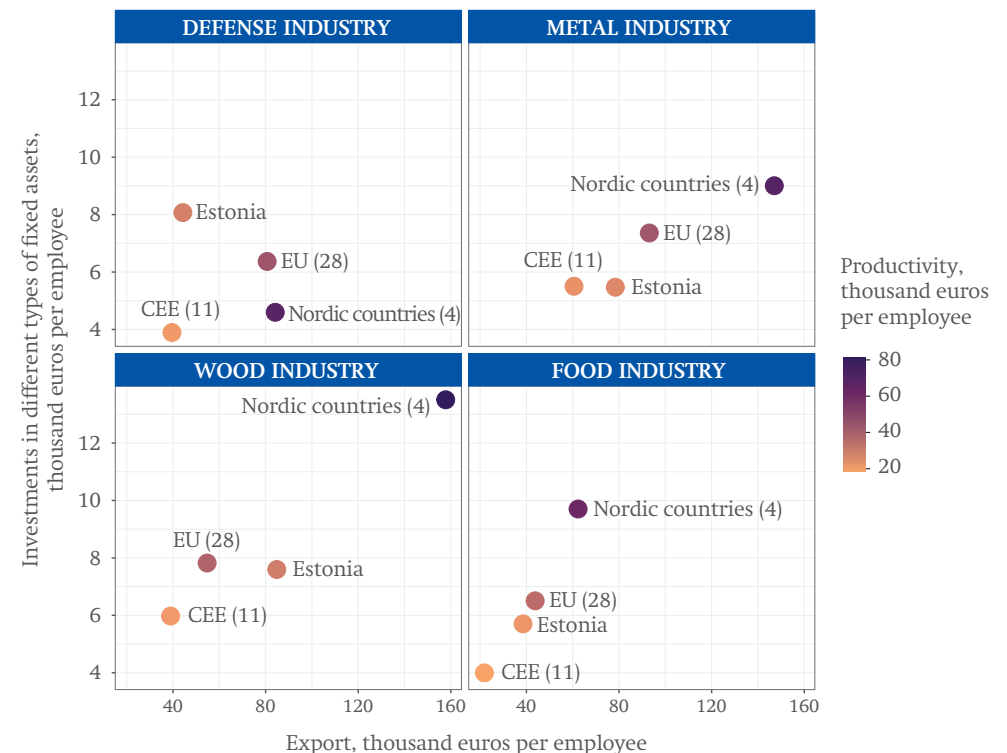
and production methods from suppliers, customers, and competitors. The higher the level of development of the export market, the more efficient is the learning process.

- Compared to Central and Eastern European countries, Estonia's export intensity per employee is high, but remains below that of the Nordic countries and the developed Western European countries.

In addition to investments, external demand is boosted by the productivity of exports. In the Estonian metal, wood, and food industries, labour productivity is growing in line with the growth in export and investment volumes. Compared to metal and wood industries, labour productivity in the food industry, which depends on local consumer preferences, is more closely related to investment volumes and less to exports. In the Estonian defence industry, the share of investments per employee is higher than in the Nordic and CEE countries as well as the EU average, while exports per employee are lower, which is also reflected in lower productivity.

**Fig. 6.** Investments in tangible and intangible fixed assets, exports per employee

Source: Authors' calculations based on the EIB Investment Survey 2017 data



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