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PRODUCTIVITY DIFFERENCE BETWEEN A FOREIGN DIRECT INVESTMENT AND DOMESTIC CAPITAL FIRMS IN LATVIA IN THE AGRICULTURAL, FORESTRY AND FISHING SECTOR: A FIRM-LEVEL ANALYSIS

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Abstract. This study examines firm-level panel data to determine the productivity level per employee between domestic capital firms and their foreign counterparts in the agricultural, forestry and fishing sector in Latvia during the 2014-2021 period. Two groups of firms were created. The first firm group represents firms in which at least 10% of the share capital belongs to foreign direct investors. While the second group represents firms whose share capital is fully owned by the residents of Latvia. Productivity indicators are calculated for both groups. To assess the productivity differences across domestic firms and firms with foreign capital in Latvia, the author has combined a rich firm-level dataset using ORBIS and Lursoft IT Ltd. data. Based on the results, it can be concluded that the firms with foreign capital are, on average, more productive than the firms whose share capital is only Latvian capital. The difference in productivity is especially visible in the forestry and logging sub-group in small size firms.

Key words: productivity, foreign direct investment, firm size, agricultural.

JEL code: D24, E24, F21, J24

Introduction

Labour productivity, along with capital and labour force, is a determining factor in the formation of a competitive economy. Given that Latvia's labour force is limited due to the demographic issues, and total investment levels remain low, a sustained increase in labour productivity is important for long-term economic growth. Although the agricultural, forestry and fishing sector is not one of the largest in the national economy of Latvia, it still plays a significant role. This sector accounts for 3.9% of Latvia's added value and employs 6.8% of the total number of people employed in Latvia. In addition, this sector plays a crucial role in the export of Latvian goods, especially in the export of wood and cereals, which have long been one of the main driving forces of the export of goods.

Even though productivity assessment methods and their influencing factors have been widely studied in the scientific literature both in Europe and in Latvia, productivity is still a topical research topic. This is due to the fact that even within the same industry, the level and dynamics of labour productivity are extremely heterogeneous. Studying the size and causes of this heterogeneity will help to understand the reserves and conditions for the acceleration of added value, as well as the role of capital volume in these processes. Moreover, with the development of new data processing tools and the availability of firms' data at the micro level, it shows new analysis possibilities and helps to solve issues related to uneven productivity levels and growth.

The impact of FDI (foreign direct investments) on productivity cannot be ignored given the trend of increasing FDI in Latvia in general and in the agricultural, forestry and fishing sector in particular. Foreign direct investment is perceived not only as a quantitative source of financing, but also as an opportunity for technology and knowledge transfer, which can potentially result in higher paid jobs, as well as more efficient management and operation of the firms. Based on International Monetary Fund definition, immediate direct investment relationships arise when a direct investor directly owns equity that entitles it to 10% or more of the voting power in the direct investment enterprise. Control is determined to exist if the direct investor owns more than 50% of the voting power (IMF, 2013).

The aim of this article is to determine which firms in agricultural, forestry and fishing sector in Latvia are more productive - firms with foreign capital or with local capital. The research subject is the firm

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productivity in the agricultural, forestry and fishing sector. The research object is labour productivity. The novelty of the research is that unique firm data were collected and analysed and the fact that to date, the firms' productivity with foreign capital and with local capital in agricultural, forestry and fishing sector in Latvia has not been sufficiently collected and analysed. Qualitative and quantitative methods of scientific research, including content analysis for theoretical and Internet sources, logical construction, analysis of dynamic indicators and generalization methods were applied when developing this article. The empirical method was based on the analysis of publicly available scientific and other articles, as well as publicly available statistical databases and data of specially selected firms. The theoretical and methodological basis of the research is economic literature and scientific articles, publications of the International Monetary Fund and Organization for Economic Co-operation and development, statistical data of the Bank of Latvia and Orbis, Lursoft IT Ltd. data.

Literature review

Historically, the concept of productivity has been associated with the use of agricultural products and generally characterized the effectiveness of the use of factors of production (labour, land, capital) in obtaining agricultural income (Dellmann K., Pedell K., 1994). Productivity, in a general sense, is determined by the ratio of the final product (output) to the input factor spent on its production (Yaisawarng S., 2007).

Traditionally, labour productivity is considered from the point of view of the efficiency of the use of labour resources and is determined through a system of various indicators. One of the methods for determining the level of labour productivity is the calculation of the intensity of production as the ratio of the volume of revenue of enterprises to the number of employees (OECD, 2001).

The direct impact of FDI on the host country productivity is uneven. Numerous studies have proven a positive relationship between FDI inflow and agricultural sector development. First of all, FDI provides a source of funds that are critical to the development of the food industry (Khan A. et al., 2021; Brambilla I. et al., 2009). Inflows of FDI in the agriculture industry help increase productivity by sharing advanced agro-technology, sharing modern production and management methodology (Zhao M., et al., 2020; Jin S., Tokunaga S., 2007). Moreover, domestic food firms may benefit from technology spillovers and global market information, and become more competitive in the international market (Jin S. et al., 2017). FDI in land by developed-country investors positively influence food security by expanding land used for crop production because of home institutional pressure for human rights respect and responsible farmland conduct, in addition to positive spillovers (Santangelo G., 2018). Adom (Adom P. et al., 2018) argues that leading technology with biodegradable properties allow to improve environmental degradation and increase productivity by reducing production costs. While Wen (Wen Z. et al., 2020) has found that innovative production process augments the possibilities of higher productivity, which is the result of R&D in agriculture.

According to Jiang (Jiang H. et al., 2021a, 2021b), two mechanisms link financial markets to economic development and investment activity. Firstly, it establishes financial markets and raises funds for high-return businesses. Secondly, it improves productivity. It illustrates that FDI increases liquidity, diversifies assets, and directs capital to the most lucrative firms.

Despite these advantages, there are widely discussed FDI negative spillovers on the host economy enterprises and the scale of crowd out effect (De Backer K., Sleuwaegen L., 2003; Kosova R., 2010). Jin (Jin S. et al., 2017) has proved that the negative impact of FDI on the domestic food industry is substantial.

While Cotula (Cotula L., 2016) argues that many large natural resource projects implemented by foreign investors have degraded the environment.

To conclude, foreign investment in agriculture can have both positive and negative social, environmental and economic outcomes in recipient countries. By contributing capital, know-how and market links, foreign investment can help to generate public revenues, develop infrastructure and create employment in countries with limited alternative options for development. However, foreign investment may fail to create enough positive linkages with the local economy, for instance in the form of employment and opportunities for local businesses (Cotula L., 2016). Given the potential for both positive and negative outcomes, the quality of investment, not just its quantity, matters a great deal (UNDP., UNEP, 2011).

Research methodology, results, and discussion

1. Methodology of the research

In the scientific environment, there is a widespread use of productivity analysis based on firm data or analysis at the micro level (Bartelsman E., Doms M., 2000; Syverson C., 2004; Bartelsman E. et al., 2009). Firm-level data can be used to establish stylized facts about the dispersion of productivity across firms, the uniformity of changes in productivity, the persistence of productivity differentials, the consequences of firm entry and exit, and the importance of changes in resource reallocation across firms to aggregate productivity growth (Ahmad S. et al., 2018). Analyses based on firm-level data have the potential to more credibly identify the effects of certain policies than studies using only aggregate (country or industry-level) data, and also to describe the mechanisms behind the policy effect in more detail (Gal P., 2013). A lot of OECD research has utilized harmonized cross-country firm level data from ORBIS to explore the contribution of public policies to cross-country differences in productivity, innovation and resource allocation (Andrews D., Cingano F., 2012; Andrews D. et al., 2014; Andrews D., Criscuolo C., 2013).

In this research, productivity is defined as value added per worker. While, the added value was calculated based on firm profits, taxes paid and personnel costs. In order to obtain real indicators (chain-linked reference year 2015) from nominal ORBIS and Lursoft database indicators, a gross domestic product deflator was applied. Such productivity calculation is widely used in scientific literature (Hadengue M., Warrin T., 2013; Barnett A. et al., 2014).

To assess the productivity differences in agricultural, forestry and fishing sector across domestic firms and firms with foreign capital in Latvia, the author combine a rich firm-level dataset.

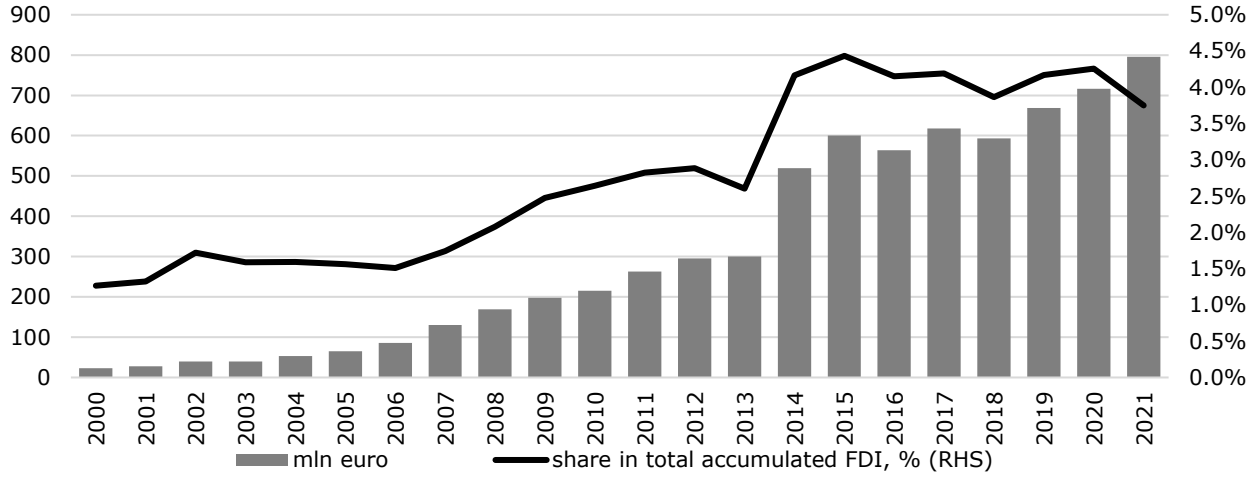
The data are obtained by matching two databases based on firm registration number, including the Orbis and Lursoft database. The matching of the databases allows to obtain important indicators to measure productivity. The data for this research is acquired from the Orbis database provided by Bureau van Dijk. Orbis provide access to precise and standardized information on around 400 million public and private firms. Thus, it is the largest database at the enterprise level in the world. The main advantage of the database is that it collects information on both large joint stock firms and small limited liability firms with only a few employees. ORBIS includes information on firms' financial indicators, number of employees, capital structure. Database consists of items from annual reports, and the coverage depends on the requirements and is country specific. Moreover, this database provides information on firm ownership, which enables to distinguish between domestic firms and foreign-owned affiliates serving a particular country and sector. Data on taxes paid by the firm, profit or loss, as well as the number of employees are selected from the Orbis database. However, the Orbis database did not have comprehensive information on personnel costs. Thus, Lursoft IT Ltd. data on the firm's administrative costs and personnel costs were

also used. In cases where information about the firm's wage fund was not available, it was considered that personnel costs make up 70% of the firm's administrative costs.

The analysis of this study is based on Orbis and Lursoft database data, which were available in March 2023. The sample period that author examining is between 2014 and 2021. Overall, the study covers 3485 firms that were registered and conducted economic activity in Latvia in agricultural, forestry and fishing sector. Several restrictions were imposed on the data selection process. First, only capital companies (joint stock companies and limited liability companies) have been analysed in this study, as information on the shareholder structure is available for these firms. Second, only those firms that perform economic activity were selected for analysis. If the firm is registered in the Latvian commercial register, but its turnover is 0, then such a firm is not selected. Third, only the firms employing at least one employee were selected. If the firm has one part-time employee, then in this case such a firm was not selected.

2. Research results

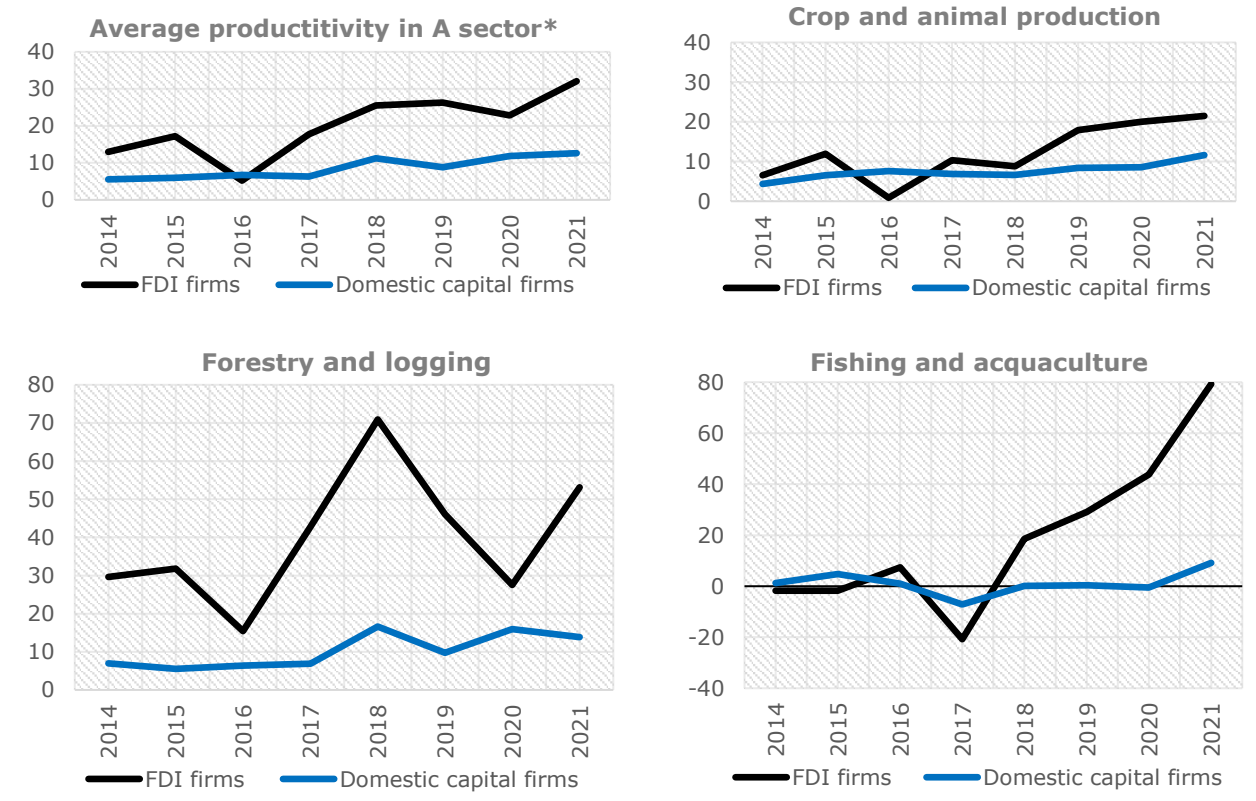
In terms of sectors, there are five leading economic sectors in Latvia, which attract high foreign investors' attention, agricultural, forestry and fishing sector is one of them. By the end of 2021, the volume of FDI in this sector amounted to 796 million euro or 3.7% of the total accumulated FDI in Latvia (Fig. 1). The amount of foreign direct investment in the agricultural sector shows the growing dynamics of several years, which was not affected by the global financial crisis in 2009, the export embargo of food products introduced by Russia in 2014, as well as the COVID-19 pandemic. A handful of counties provided the lion's share of the cumulative FDI in agricultural, forestry and fishing sector in Latvia. The major investors came from The Baltic Sea region and from countries with which Latvia had long-term and close trade cooperation. By the end of 2021 the largest amount of accumulated FDI in the agricultural, forestry and fishing sector came from Sweden, which is represented by such investors as *Sodra Skogsagarna ekonomic forening, SILVESTICA GREEN FOREST AB, Skogsfond Baltikum AB (publ), Latvian Forest Company AB*. A significant inflow of investments can also be observed from the Netherlands, which is represented by such firm as Ingka Investments B.V. While, the third country with significant investment in the agricultural, forestry and fishing sector is Denmark, which is represented by such investors as *Inleby Denmark 1 A/S, DDH FOREST BALTIC A/S*. The structure of the largest foreign direct investors in the agricultural, forestry and fishing sector corresponds to the "long tail" principle, as the 10 largest investors account for approximately 50% of the total accumulated FDI in this sector. It is worth noting that a larger inflow of investments, both in terms of volume and number of firms, can be observed in the forestry sector, while the volume of investments in the agricultural and fishing sector is significantly lower.



Source: the Bank of Latvia and author's calculations based on the Bank of Latvia data

Fig. 1. **Accumulated foreign direct investments in Latvia's agricultural, forestry and fishing sector (mln euro) and share in total accumulated FDI (%, RHS)**

Based on the developed methodology and data selection criteria, a total of 3485 firms were selected that perform economic activity in the agricultural, forestry and fishing sector. It is important to emphasize that only economically active capital firms with at least 1 full-time employee are selected. Of them, 265 firms in which at least 10% of the share capital belong to foreign investors.



Source: author's calculations

Fig. 2. Average productivity per employee in Latvia's agricultural, forestry and fishing sector (thsd euro) during 2014-2021[2]

According to the results, it should be concluded that firms with foreign capital are generally more productive compared to those firms with only local capital in their structure (Fig. 2). However, the dynamics

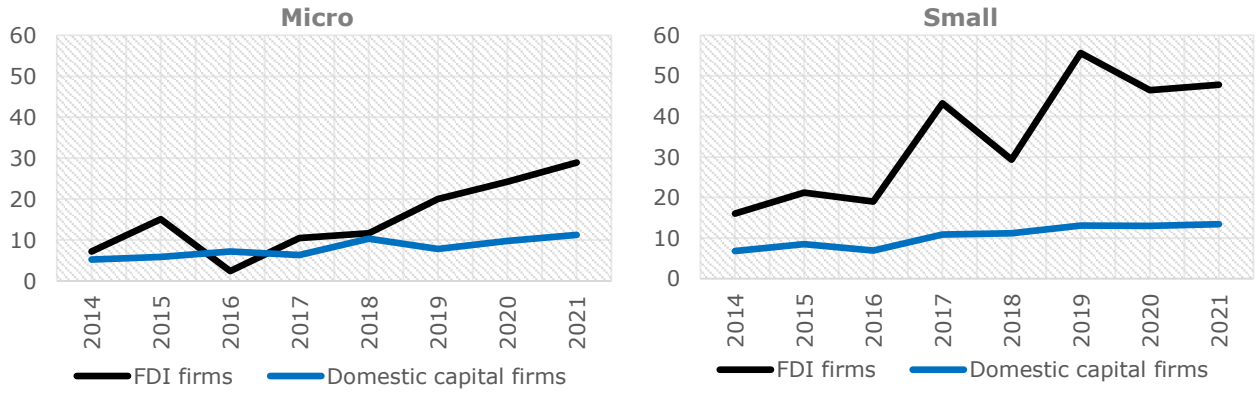
[2] * according to the statistical classification of economic activity NACE 2. red., the A sector consists of the agricultural, forestry and fishing sub-sectors

of productivity both over time and across sub-sectors is heterogeneous. Productivity in firms with foreign capital is more volatile in all sub-sectors. At the same time, when evaluating the average productivity in the agricultural, forestry and fishing sector since 2017, it must be concluded that productivity in firms with local capital began to significantly lag both in terms of volume and dynamics compared to firms with foreign capital.

Business conditions, such as tax burden, labour availability, institutional environment, are the same for both groups of firms, meaning that the difference in productivity was caused by internal factors of the firms. One such factor is the level of wage. During the analysed period, an employee working in a foreign direct investment firm earns on average 2.6 times more than an employee working in a firm with local capital. Even in 2016, when the productivity of foreign firms decreased, this proportion remains. In 2016, the decrease in the productivity of foreign direct investor firms was determined by the decrease in the amount of profit. On the other hand, in recent years, a rapid increase in average productivity in firms with foreign capital has been associated with significantly higher profits. Within the framework of this study, it is not possible to answer the question why foreign direct investor firms pay higher wages, but we can hypothesize that it is related to the export-oriented business model.

According to the collected data, both groups of firms are dominated by micro and small firms. Thus, in the group of firms with domestic capital, 88.5% are micro firms (up to 9 employees) and 9.7% are small (from 10 to 49 employees) firms. While, in the group of firms with foreign capital, the number of micro and small firms is 82.0% and 14.5%, respectively. Thus, it should be concluded that in both groups of firms, medium and large firms make up only a few percent of the total number of firms. In general, this situation is typical not only for the agricultural sector, but to a large extent for all sectors, which reflect the small size of Latvia's economy.

It can be concluded that there is a positive connection between the size of the firm and the level of productivity. However, an obvious correlation can be seen in firms with FDI capital, but in firms with domestic capital this correlation is rather moderate (Fig. 3). Analysing the average level of productivity in the group of micro and small firms, where a larger share of firms is concentrated, the average productivity in foreign investment firms is approximately twice as high in small firms compared to micro firms. In firms with domestic capital, such a pronounced difference does not exist, and the level of productivity is slightly higher in small firms compared to micro firms.

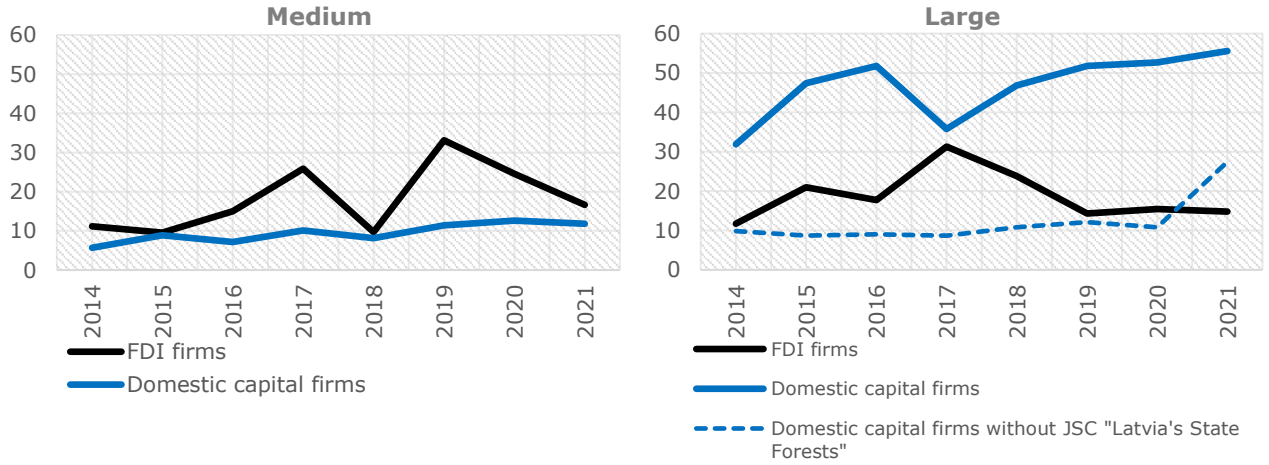


Source: author's calculations

Fig. 3. **Average productivity per employee in Latvia's agricultural, forestry and fishing sector (thsd euro) in micro and small firms during 2014-2021**[3]

[3] Firms are divided into four groups according to the number of employees: micro (9 and fewer employees), small (10-49 employees), medium (50-249 employees), large (more than 250 employees)

Surprisingly, the level of productivity in medium and large firms with foreign capital is lower than in small firms. According to the author, this can be explained by several factors. First, with profit margins in various agricultural sub-sectors. Thus, in small firms with foreign capital, the largest contribution to average productivity is provided by firms in the forestry and logging sub-sector, which manage forest resources in Latvia and employ up to 40 employees. On the other hand, the group of large firms with foreign capital is represented only by a few firms that work in the crop and animal production sub-sector. In such firms, the amount of taxes paid is much higher, as well as the salary fund compared to micro or small firms, but the amount of profit is not high. Therefore, relatively small profit in relation to the size of the firms explains the relatively low productivity in the group of large firms. Second, given that the group of medium and large firms consists of limited number of firms, these groups are quite homogeneous, so one or more firms could have a large impact on the average productivity of the group, especially in cases where the firm could be making losses. This factor can be applied to both FDI firms t and domestic capital firms.



Source: author's calculations

Fig. 3. **Average productivity per employee in Latvia's agricultural, forestry and fishing sector (thsd euro) in medium and large firms during 2014 2021**

The results that reflect the average productivity in the group of large firms with domestic capital attract special attention. On the one hand, the average productivity is very high, but such a high level is achieved thanks to the state-owned Joint Stock Company "Latvia's State Forests". Excluding this firm and summarize the average productivity of other large firms, then the level of productivity is significantly lower. It only confirms what was said above, that the productivity of large firms should be evaluated cautiously, since this group is represented by a limited number of firms. Depending on the chosen business model, business advantages and financial results, the average productivity of a specific firms could be significantly different.

It is important to point out that in each group of firms there is a significant variation in productivity both in firms with FDI capital and in firms with domestic capital. Thus, the level of productivity, for example, in some micro firms is higher than in most medium-sized firms. In addition, the productivity distribution of firms has a pronounced positive asymmetry. This describes the case where a small number of firms has very high productivity, which significantly increases the average productivity level in this group of firms. On the other hand, for a sufficiently large part of the firms, the productivity is lower than the average, that is, the median productivity is lower than the average productivity.

Conclusions, recommendations

1) Using the agricultural, forestry and fishing sector firm-level data from 2014-2021 that are registered in Latvia, this study attempts to determine the productivity level per employee. Two groups

of firms were created, namely firms with foreign capital and domestic capital. It must be concluded that the average productivity per employee is higher in firms with foreign capital.

2) Firms with foreign capital are more productive in all agricultural sectors, but there is a particularly large gap in the forestry and logging sub-sector, which is largely influenced by higher profit indicators compared to firms with local capital.

3) In firms with foreign capital, higher productivity per employee is recorded in small firms with 10 to 49 employees. Larger foreign investors, who represent mainly the forestry and logging sub-sector, have performed in this firm size group. In firms with local capital, there are no significant differences between the size of the firms. However, the data of the last year's show that the productivity of large firms is growing faster.

4) Evaluating productivity by firm size, it should be concluded that there is a significant variation in productivity both in firms with foreign capital and with domestic capital. Thus, productivity levels in some micro firms are higher than in most medium-sized firms. In addition, the productivity distribution of firms has a pronounced positive asymmetry.

5) Firm productivity is influenced not only by the country of origin of capital as such, but also by firm management, work organization, and employee motivation system. The impact of such factors on productivity is relatively difficult to quantify at the micro level. However, there are other factors that could affect productivity, such as age of firms, location, availability of finance. In future research, the above factors can be added as explanatory indicators of productivity.

6) The agricultural sector attracts significant attention from foreign investors. The inflow of foreign direct investment in this sector showed a steady increase in the last decade. By the end of 2021, the volume FDI in this sector amounted to 796 million euro or 3.7% of the total accumulated FDI in Latvia. The major investors came from the Baltic Sea region and from countries with which Latvia had strong trade cooperation, for example, Sweden, the Netherlands, Denmark.

7) The structure of the largest foreign direct investors in the agricultural, forestry and fishing sector corresponds to the "long tail" principle, as the 10 largest investors account for approximately 50% of the total accumulated FDI in this sector, concentrating mainly in the forestry and logging sector.

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