

The role of productivity and other factors in the internationalization of Polish firms. The initial results of a survey

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Evidence from recent empirical micro-level surveys such as Bernard & Jensen (1995, 2001), Clerides et al. (1998) or Eaton et al. (2004) indicates large firm heterogeneity. Following a seminal contribution by Melitz (2003) theoretical models started to include firm heterogeneity by incorporating the actual distribution of productivity between firms. The models prove that only very productive firms are able to enter and remain on more demanding foreign markets. Export status is linked to productivity advantage.

Apart from several studies the literature on the role of firm heterogeneity in Poland's trade is in its infancy. The goal of this article is to present the initial results of a large survey of Polish exporting and non-exporting firms aimed at filling this important gap. The survey included numerous questions in the area of firm competitiveness, innovation potential, export performance and strategies as well as barriers to exporting and policy expectations. The results of the survey have been supplemented with analysis of detailed financial data provided by InfoCredit allowing us to estimate numerous indices linked to economic and financial performance of enterprises including: capital and labour productivity, overall productivity measured by TFP and profitability.

JEL classification: F12, F14, C83

Keywords: exporters, non-exporters, Poland's trade, firms' survey

The research was conducted and financed within the grant of National Science Centre “Analysis of international trade of Poland in the light of new trade theories. Implications for economic policy at the crisis era” (2012/05/B/HS4/04209) chaired by Professor Krystyna Gawlikowska-Hueckel.

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1. Introduction

The research we present in this paper is a result of a project “Analysis of international trade of Poland in the light of new trade theories. Implications for economic policy at the crisis era”¹. The project was carried out in 2013-2015. An inquiry into factors that determine exporting activity was one of the project's components.

As researchers from Poland we do not have access to firm-level or micro-level data for individual enterprises from databases, for instance managed by public agencies such as Central Statistical Office of Poland (GUS). This is a serious obstacle and in fact a barrier that makes it impossible to conduct and present analyses that would contribute to international scientific debate on the role of heterogeneity of firms initiated mainly by M. Melitz (2003). Our strong conviction that we shall take part in this debate has led us to an idea, that data for exporters vs. non-exporters characteristics can be collected through questionnaire research. But at the same time it shall be supplemented by financial data – that would enable us to have a look into most important information from heterogeneity concept point of view – that is productivity. The data was bought from InfoCredit, a company that systematizes and transform micro-level data and thus is responsible for Polish data input into the Amadeus database.

It has to be explained what approach we have taken. The sine qua non condition was that for an enterprise we have a complete 5 year period of data availability in InfoCredit records. Total revenues from sales per enterprises should exceed 2 million PLN (roughly 500k EUR) each year, exports shall be more than 1 million PLN each year (or approx. 250k EUR). This constituted a database of about 5500 enterprises, from which we randomly selected ones that shall be contacted, in each of Poland's NUTS-2 provinces, and asked them to take part in questionnaire research. Our idea was to have enterprises that are doing business predominantly in manufacturing industry, but it turned out not to be an easy condition to be fulfilled (as area of doing business declared in statistical record often differs from the actual business). In the second stage, we have randomly selected non-exporters. Their distribution in terms of regions corresponded to that of exporters. Questionnaire was of direct contact character, meaning that a pollster personally visited the enterprises and conducted in-depth interviews.

Summing up, the Respondents in the present study consists of rather large enterprises (upper tail of distribution), predominantly from manufacturing industry, that have at least 5 year continuity of financial reports (and thus exist for at least 5 years). Regional representativeness at NUTS-2 level is assured. Out of 709 effectively questioned enterprises, 498 were exporters (X). The remaining were non-exporters (NX). In final calculations we took branch weights into account. They were calculated according to branch structure of firms in the initial database that we obtained from InfoCredit, from which we randomly selected Respondents to be interviewed. Thus final results are estimations for study population, not just calculations for the sample.

The questionnaire (in Polish, available upon request) focused on the following categories/groups of questions: competitiveness, barriers and obstacles of doing business, consequences of membership of Poland in the EU and of "crisis 2008+", exports, imports, firms expectations and perspectives for the future. In the paper we present only initial research results based on main questions of the survey. As has been already mentioned, survey database was supplemented by financial data obtained from InfoCredit.

The structure of the remainder of the paper is as follows. In section 2 we focus on the nexus between internationalization of companies and their innovativeness. In section 3 we discuss the links between

¹Financed by National Science Centre (grant number: 2012/05/B/HS4/04209), carried on in Institute for Development and chaired by prof. Krystyna Gawlikowska-Hueckel.

firm productivity and export status. Section 4 discusses the impact of foreign ownership on export performance while the next one the impact of importing. In section 6 we describe years in exports activity and number of markets served. Section 7 focuses on perception of exporting activity and its consequences. Section 8 focuses on barriers and obstacles to exporting activity. Finally, the last section concludes, discusses the limitations of our research as well as gives guidelines for future empirical studies.

2. Innovation and exports performance

Several important studies find that innovation and exporting are inextricably linked at firm-level. Aw et al. (2011) find that the marginal benefit of simultaneous exporting and innovating increases with productivity, with self-selection effect typical for heterogeneous firm literature à la Melitz (2003) driving a large part of the observed complementarity. Cassiman and Golovko (2011) show that product and to some extent process innovation drive firm exports.

In a recent paper Altomonte et al. (2013) show that there is a positive, broad, strong and robust correlation between the extent of internationalization of firms and innovation activities in the panel of European manufacturing firms (EFIGE dataset). Internationalization and innovation are highly interrelated. The results obtained by Cieřlik et al. (2014) confirm the importance of firm characteristics for export performance in the CEE countries, including Poland.

According to Cieřlik et al. (2014) the financial support to R&D and innovation activities should also have a positive impact on the export performance of firms. Altomonte et al. (2013) point that trade promotion and innovation policies should be better and closely coordinated to reap the benefits of the apparent synergies.

We have to stress however that the up-to-date literature treats the notion of innovation in a very simplified manner. In most of the studies it has been proxied by R&D spending (e.g. Cieřlik et al. 2014).

Hobday et al. (2004), in their interesting study on Korean firms, distinguish 4 different groups of firms according to innovation capability depending on their awareness of need to change and preparedness and ability to change in practice. Firms with low awareness and low ability to change are unaware and passive and thus constitute the non-innovator group. Firms having mediocre or high awareness and ability constitute the innovators group. Ad hoc innovators introduce innovations from time to time and can be followers (they introduce it following the leaders) and thus have reactive strategies or can be the leaders themselves and thus behave in strategic manner assuming the role of a leader (and thus gaining first mover advantage). Highly innovation-aware firms, introduce innovations constantly and thus are referred to as creative.

Our intention was also to identify important differences between exporters and non-exporters in this respect. Results are presented in Table 2.

Respondents, generally, are aware of the need of change – 75,6 per cent of them identified it as important or key. Looking at the structure of responses of exporters and non-exporters it is clear that exporters are more aware of the need to change than non-exporters. The difference between the two analysed groups is statistically significant (chi-square test).

Table 1. Respondents' readiness to introduce changes

| | | How far is the firm prepared and able to change in practice? | | | | | Overall |
|--|----------------------|--|--------|--------|--------|----------|---------|
| | | 1 - low | 2 | 3 | 4 | 5 - high | |
| How far firm is aware of the need to change? | 1 – low (irrelevant) | 41,8% | 17,1% | 4,3% | 0,5% | | 4,1% |
| | 2 | 10,0% | 30,3% | 4,8% | 1,1% | 1,7% | 4,3% |
| | 3 | 41,1% | 18,0% | 36,0% | 7,3% | 4,4% | 16,0% |
| | 4 | 3,6% | 29,4% | 39,5% | 59,2% | 13,5% | 36,8% |
| | 5 – high (key) | 3,5% | 5,2% | 15,4% | 31,9% | 80,4% | 38,8% |
| Overall | | 100,0% | 100,0% | 100,0% | 100,0% | 100,0% | 100,0% |

Source: Own elaboration, based on survey results.

Table 2. To what extent the Respondent is aware of the need to change? Exporters vs. non-exporters differences (percent of responses)

| | Exporters (X) | Non-exporters (NX) | Overall (X+NX) | Ratio X/NX |
|----------------------|---------------|--------------------|----------------|------------|
| 1 – low (irrelevant) | 3,5% | 5,3% | 4,1% | 0,67 |
| 2 | 3,1% | 6,8% | 4,3% | 0,45 |
| 3 | 14,4% | 19,4% | 16,0% | 0,74 |
| 4 | 35,9% | 38,6% | 36,8% | 0,93 |
| 5 – high (key) | 43,0% | 29,9% | 38,8% | 1,44 |
| Overall | 100,0% | 100,0% | 100,0% | – |

Source: Own elaboration, based on survey results.

Table 3. To what extent is a respondent prepared and able to change in practice? (percent of responses)

| | Exporters (X) | Non-exporters (NX) | Overall (X+NX) | Ratio X/NX |
|----------|---------------|--------------------|----------------|------------|
| 1 – low | 3,3% | 6,7% | 4,4% | 0,50 |
| 2 | 5,0% | 6,7% | 5,5% | 0,75 |
| 3 | 22,7% | 33,5% | 26,1% | 0,68 |
| 4 | 37,1% | 30,8% | 35,1% | 1,20 |
| 5 – high | 31,9% | 22,4% | 28,8% | 1,42 |
| Overall | 100,0% | 100,0% | 100,0% | – |

Source: Own elaboration, based on survey results.

Most of firms (64 per cent) judge their ability to introduce innovations as high (4 or 5) and only 10 per cent as low (1 or 2). The ratio of responses by exporters to non-exporters once again points in favour of exporters. The difference between the two analysed groups is statistically significant (chi-square test).

Generally, as exporters are more aware of the need to change and have higher ability to introduce change in practice – they should be more innovative. It however highly depends on their market strategies.

Table 4. Market strategies followed by respondents (in per cent)

| | Exporters (X) | Non-exporters (NX) | Overall (X+NX) | Ratio X/NX |
|--------------------|------------------|-----------------------|-------------------|---------------|
| Passive | 15,7% | 25,2% | 18,8% | 0,62 |
| Ad hoc - reactive | 18,2% | 27,8% | 21,3% | 0,65 |
| Ad hoc - strategic | 18,3% | 17,0% | 17,9% | 1,08 |
| Creative | 47,8% | 30,0% | 42,1% | 1,59 |
| Overall | 100,0% | 100,0% | 100,0% | – |

Source: Own elaboration, based on survey results.

Around 18,8 per cent of companies declare that they do not introduce change. They are thus passive. Passive firms represent 15,7 per cent of exporters and 25,2 per cent of non-exporters. 39,2 per cent of firms declare to introduce innovation from time to time. Non-exporters are more likely to be reactive ad hoc innovators (followers) and exporters are more likely to be strategic ad hoc innovators thus taking overall the role of the leader in the relevant market. 42,1 per cent of firms declare to introduce change constantly which is surprising. 47.8 per cent of exporters and 30 per cent of non-exporters can be referred to as creative. The difference between exporters and non-exporters is once again statistically significant (chi-square test).

The high share of creative firms should be treated with caution. One of the questions in the questionnaire allows us to verify it. Have the company got in the last three years innovative products or services in the offer? 58,3 per cent of enterprises answered no. 22,9 per cent answered that they introduced new products or services which were innovative for the firm, and only 18,8 per cent introduced new products or services which were innovative for the market in which they operated.

Table 5. Character of innovations (their novelty) introduced by Respondents

| | Exporters (X) | Non-exporters (NX) | Overall (X+NX) | Ratio X/NX |
|---------------|------------------|-----------------------|-------------------|---------------|
| no | 54,1% | 67,1% | 58,3% | 0,81 |
| new to firm | 25,9% | 16,5% | 22,9% | 1,58 |
| new to market | 19,9% | 16,4% | 18,8% | 1,22 |
| Total | 100,0% | 100,0% | 100,0% | – |

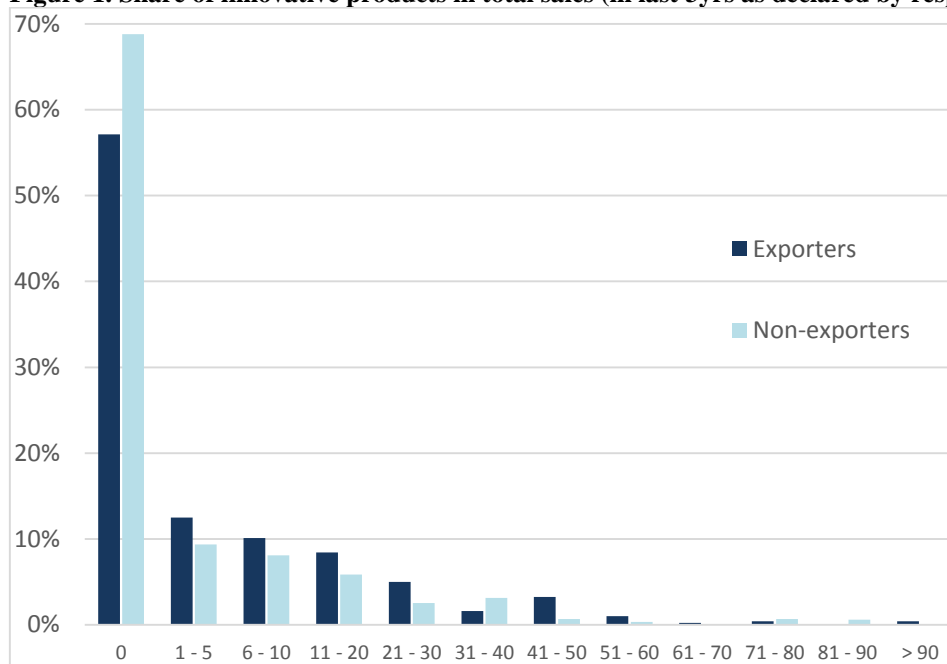
Source: Own elaboration, based on survey results.

The firms have also indicated the share of innovative products and services in their total sales in the last three years. The share of innovative products is overall low, with small advantage for exporters over non-exporters which is clear from the histogram beneath. The distribution is clearly skewed to the left as was expected.

In another question: “In the past three years the company has introduced new products or services” 44,7 per cent of firms answered no (42,9 per cent of exporters and 48,4 per cent of non-exporters) and 55,3 per cent agreed (57,1 per cent of exporters and 51,6 per cent of non-exporters).

We take the introduction of new products or services as a verification of the actual status of innovator. If the firm declares to be creative (permanent innovator) or ad hoc innovator, but has not introduced a new product or service in the last three years we treat it as non-innovator.

Figure 1. Share of innovative products in total sales (in last 3yrs as declared by respondents)



Source: Own elaboration, based on survey results.

Table 6. Character of innovations (creativity and leadership) introduced by Respondents

| | Exporters (X) | Non-exporters (NX) | Overall (X+NX) | Ratio X/NX |
|--------------------|---------------|--------------------|----------------|------------|
| Passive | 56,4% | 71,9% | 61,3% | 0,78 |
| Ad hoc - reactive | 6,6% | 6,4% | 6,5% | 1,03 |
| Ad hoc - strategic | 9,0% | 8,7% | 8,9% | 1,04 |
| Creative | 28,1% | 13,1% | 23,3% | 2,15 |
| Overall | 100,0% | 100,0% | 100,0% | – |

Source: Own elaboration, based on survey results.

The modified results show that overall 61,3 per cent of firms are non-innovators – 56,4 and 71,9 per cent respectively for exporters and non-exporters. 28,1 per cent of exporters and only 13,1 per cent of non-exporters are creative. Exporters are also more likely to be ad hoc innovators with the leader status in the market. The share of reactive ad hoc innovators is roughly the same in both groups.

Most of the companies introduced new products or services or technologically improved products or services (product innovation). More than half of enterprises expanded or acquired new markets for their products or services or introduced new methods of production (process innovations). Organizational innovations were less popular. The results once again point in favour of the group of exporters. However, the difference between the two groups is statistically significant only in the case of technologically improved products or services as well as expansion and acquisition of new markets for their products or services.

Table 7. Type of innovation introduced in the last 3 years by Respondents

| Type of innovation introduced in the last 3 years | Exporters (X) | Non-exporters (NX) | Overall (X+NX) | Ratio X/NX |
|--|---------------|--------------------|----------------|------------|
| new products or services | 57,1% | 51,6% | 55,3% | 1,11 |
| technologically improved products or services | 43,3% | 33,0% | 40,0% | 1,31 |
| modern methods of production | 35,3% | 26,1% | 32,4% | 1,35 |
| significant organizational changes | 26,0% | 17,7% | 23,4% | 1,47 |
| significant changes in ownership | 10,5% | 8,3% | 9,8% | 1,26 |
| start/expand cooperation with other companies (e.g. R&D) | 13,3% | 11,9% | 12,9% | 1,12 |
| expand or acquire new markets for their products or services | 31,3% | 22,2% | 28,4% | 1,41 |

Source: Own elaboration, based on survey results.

3. Productivity and exports performance

The new, new trade theory rejects the standard assumption of a representative firm and firms' homogeneity. Micro-level data clearly show that firms differ a lot between and within sectors. This new strand of literature highlights heterogeneity in productivity, size, and other characteristics even within narrowly defined industries (Melitz, Redding 2014). Furthermore, heterogeneity is systematically related to participation in foreign trade, with exporters being on average larger and more productive than non-exporters, prior to entering export markets. Only firms breaching a certain level of productivity threshold can enter and remain in the foreign markets and thus gain an exporter status. Firms with low-productivity (measured either by labour productivity or TFP) are unable to penetrate foreign markets but can also be eliminated from the domestic market. Firms usually learn their actual productivity in comparison to competitors only after they have already entered the market.

The results of recent studies clearly show that trade liberalization leads to within-industry reallocations of resources, which raise average industry productivity, as low-productivity firms exit and high-productivity firms expand utilizing economies of scale to enter export markets.

In our study we have utilized the detailed financial data provided by InfoCredit to calculate different productivity indices in order to identify statistically significant differences between exporters and non-exporters. This is only an initial description – a fully-fledge logit modelling will follow in forthcoming papers.

We have calculated several different measures of productivity. First of all its **labour productivity** (LP), measured as a ratio of total sales per worker (TS/L) and **capital productivity** (CP) measured as a ratio of total sales to total assets (TS/TA). Secondly its **total factor productivity** (TFP), measured at firm level which measures the productivity of all resources simultaneously. In order to calculate TFP we utilized the following formula, coming from neoclassical growth theory:

$$TFP_{i,t} = \bar{\alpha} \ln LP_{i,t} - (1 - \bar{\alpha}) \ln CP_{i,t} \quad [1]$$

where $\bar{\alpha}$ is an arithmetic average of production with respect to labour observed for a given firm over the analysed period and measured by a ratio of labour remuneration in firm's value added (VA).

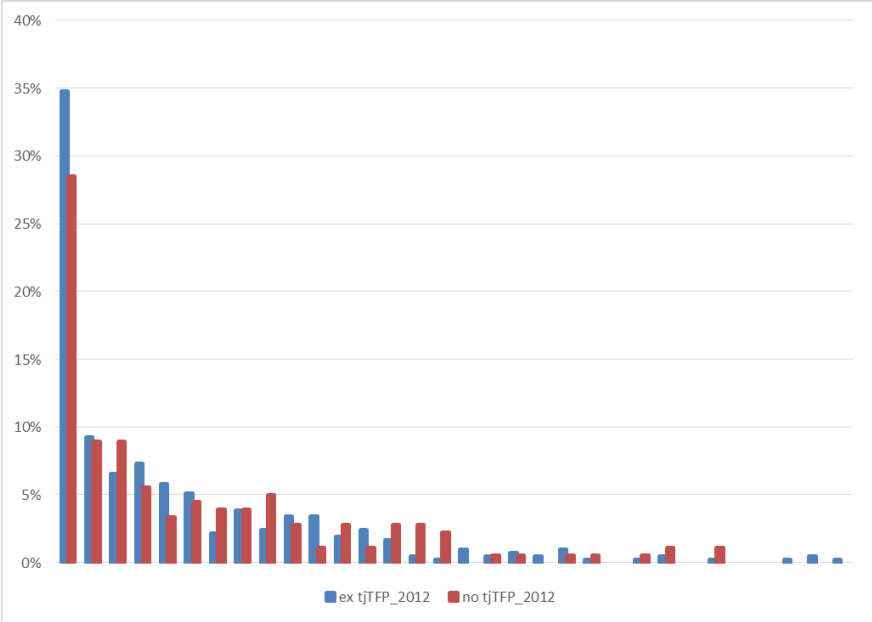
Thirdly, its total productivity (TPROD), as measured by:

$$TPROD = \sqrt{\frac{VA}{TA} * \frac{VA}{L}} \quad [2]$$

In order to identify clear differences in productivity between exporters and non-exporters we are going at first to draw histograms of distribution for three productivity measures in 2012. At first sight,

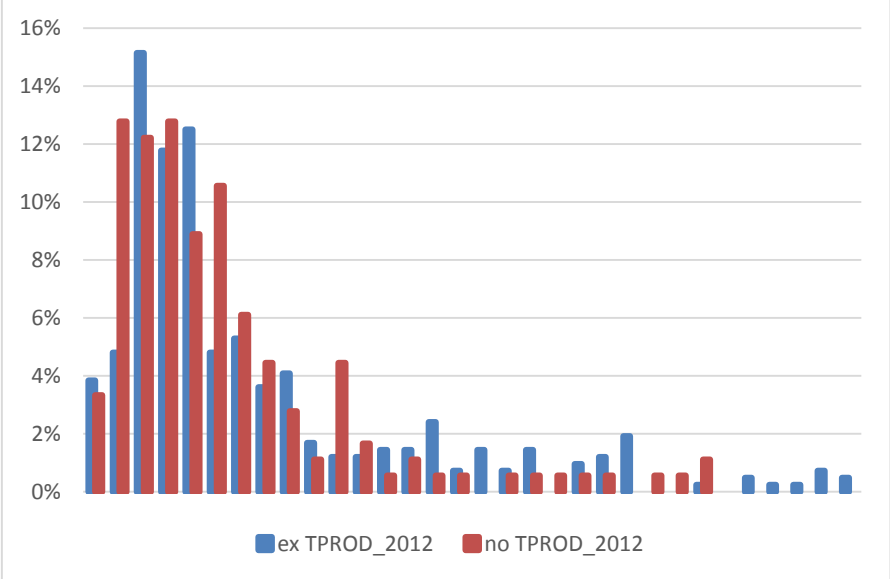
surprisingly, no major difference can be detected. The figures 2 – 4 are taking into account both manufacturing and non-manufacturing (services) firms. We have to note however the general difference in the pattern of distribution between the three analysed measures.

Figure 2. Distribution of TFP – exporters vs. non-exporters in 2012



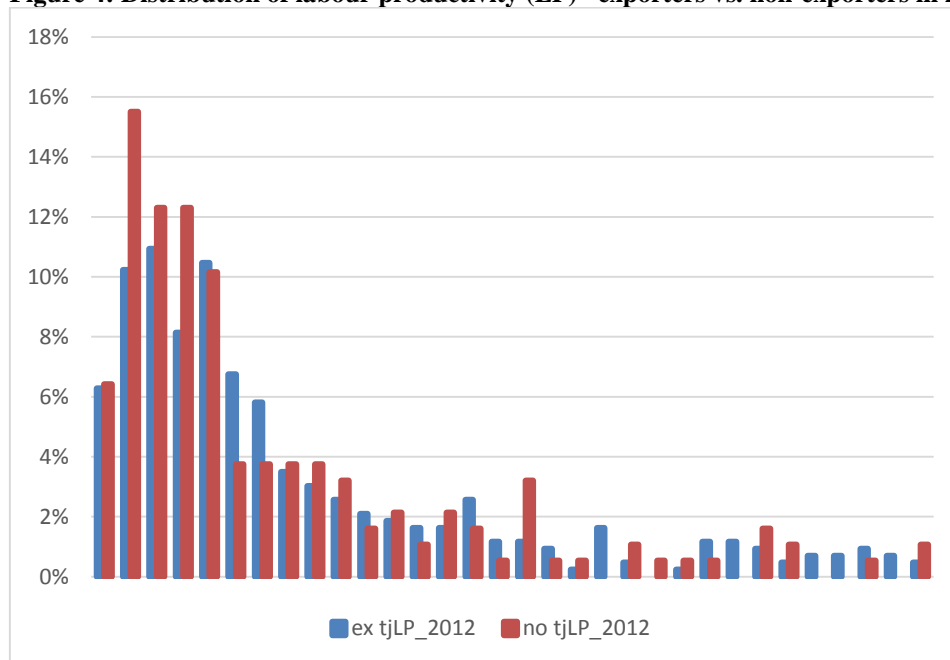
Source: Own elaboration, based on survey results.

Figure 3: Distribution of total productivity (TPROD) – exporters vs. non-exporters in 2012



Source: Own elaboration, based on survey results.

Figure 4: Distribution of labour productivity (LP) –exporters vs. non-exporters in 2012



Source: Own elaboration, based on survey results.

The distributions for both groups in all three cases are clearly skewed to the right, as could be expected. Firms with very high productivity levels are generally rare. Firms with low productivity dominate.

Undoubtedly, more elaborated techniques should be used in order to verify the major conclusions. Table 8 contains detailed statistical information on distribution of labour productivity, total productivity and total factor productivity for two analysed groups and information whether at different percentile of distribution non-exporters have higher or lower productivity than non-exporters.

The differences between the two analysed groups are statistically significant for labour productivity (based on the comparison with V-Cramer and eta, available upon request). For total productivity they are close to statistical significance. For TFP the differences between exporters and non-exporters are not statistically significant for the period 2008 – 2009, and significant for 2010 – 2013 but contrary to our expectations.

These results require further comment. The results for labour productivity are in line with postulates of theoretical literature. As to TFP we could have bias in the measurement. It could be that the case of TFP has something to do with the consequence of the 2008 crisis. For instance non-exporters in these years performed better because they were less affected and not exposed or sensitive to the same extent as exporters. The proof of that requires the use of more elaborated econometric techniques. Furthermore, we have to stress that we are dealing with specific population of companies, both exporters and non-exporters, in general older, larger, obliged to prepare financial reports, etc. generally the strongest companies from the upper tail of general distribution of firms. This for sure could bias our results. Or to put it other words: our selection of non-exporters was highly biased. Non-exporters were selected from InfoCredit databases to be similar to exporters in terms of their employment, regional structure and sales revenues. Thus our non-exporters selection is biased in this way, that they are "best non-exporters one can meet".

Table 8. Productivity differences between exporters and non-exporters

| Productivity measure | | TFP | TFP | TFP | TFP | TFP | LP | LP | LP | LP | LP | TPROD | TPROD | TPROD | TPROD | TPROD | |
|----------------------|-------------|--------|--------|---------|---------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|
| Year | | 2008 | 2009 | 2010 | 2011 | 2012 | 2008 | 2009 | 2010 | 2011 | 2012 | 2008 | 2009 | 2010 | 2011 | 2012 | |
| Exporters | N | 386,3 | 383,3 | 387,3 | 388,5 | 386,4 | 415,2 | 416,0 | 414,8 | 415,0 | 403,8 | 399,5 | 398,5 | 399,9 | 402,6 | 391,1 | |
| | Average | 7,7 | 7,6 | 8,0 | 8,2 | 7,3 | 779,3 | 752,9 | 712,5 | 796,8 | 734,2 | 158,1 | 82,9 | 81,1 | 97,5 | 85,2 | |
| | Median | 2,5 | 2,5 | 2,5 | 2,6 | 2,7 | 298,3 | 275,6 | 291,9 | 310,1 | 297,3 | 17,1 | 18,1 | 17,9 | 18,3 | 17,6 | |
| | Std. dev | 28,3 | 28,8 | 34,4 | 38,8 | 22,0 | 1316,5 | 1380,9 | 1223,5 | 1391,1 | 1163,4 | 868,5 | 228,6 | 221,1 | 270,5 | 253,9 | |
| | Skewness | 13,1 | 12,5 | 13,3 | 15,5 | 10,2 | 3,5 | 3,9 | 4,0 | 3,8 | 3,3 | 11,6 | 6,1 | 7,7 | 6,4 | 7,7 | |
| | Curtosis | 200,6 | 175,7 | 193,9 | 265,5 | 124,8 | 14,3 | 17,3 | 19,7 | 16,5 | 11,8 | 149,3 | 43,0 | 81,8 | 54,1 | 74,8 | |
| | Minimum | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 12,7 | 10,5 | 10,8 | 9,9 | 10,8 | 0,5 | 0,9 | 1,1 | 1,4 | 0,7 | |
| | Maximum | 483,1 | 445,7 | 550,5 | 688,3 | 312,8 | 9027,7 | 9687,0 | 9711,2 | 9834,3 | 8312,0 | 12757,4 | 2139,4 | 2914,9 | 3107,2 | 3096,0 | |
| | Percentiles | 10 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 78,7 | 73,4 | 74,5 | 82,8 | 80,4 | 5,9 | 6,1 | 6,2 | 6,5 | 6,5 |
| | | 25 | 0,2 | 0,2 | 0,3 | 0,2 | 0,3 | 140,5 | 135,2 | 142,4 | 156,1 | 147,7 | 9,5 | 9,8 | 10,1 | 10,3 | 9,4 |
| | 50 | 2,5 | 2,5 | 2,5 | 2,6 | 2,7 | 298,3 | 275,6 | 291,9 | 310,1 | 297,3 | 17,1 | 18,1 | 17,9 | 18,3 | 17,6 | |
| | 75 | 7,7 | 7,9 | 7,7 | 7,7 | 7,9 | 753,8 | 718,0 | 754,2 | 776,8 | 755,1 | 58,1 | 51,4 | 49,6 | 54,2 | 50,1 | |
| | 90 | 15,5 | 14,6 | 13,7 | 13,7 | 13,3 | 1905,0 | 1616,4 | 1654,0 | 1833,3 | 1663,1 | 251,9 | 195,4 | 210,9 | 247,9 | 203,0 | |
| Non- | N | 185,2 | 185,8 | 188,1 | 187,5 | 189,3 | 199,4 | 201,9 | 201,9 | 201,9 | 197,2 | 193,5 | 194,1 | 195,3 | 194,8 | 190,7 | |
| | Average | 21,9 | 18,1 | 134,7 | 242,7 | 114,4 | 417,3 | 414,5 | 379,3 | 439,1 | 462,4 | 32,8 | 41,9 | 35,0 | 45,4 | 35,9 | |
| | Median | 4,6 | 4,5 | 4,8 | 4,5 | 4,1 | 247,3 | 222,0 | 231,0 | 233,1 | 215,5 | 15,3 | 14,7 | 12,6 | 12,7 | 13,8 | |
| | Std. dev | 174,4 | 131,1 | 1305,2 | 2183,9 | 947,1 | 485,1 | 619,4 | 444,0 | 575,1 | 780,2 | 56,2 | 120,7 | 92,8 | 177,6 | 75,1 | |
| | Skewness | 13,3 | 13,3 | 12,1 | 9,4 | 9,3 | 3,0 | 5,7 | 3,0 | 3,4 | 6,4 | 5,0 | 6,8 | 7,8 | 10,1 | 4,7 | |
| | Curtosis | 178,4 | 178,3 | 151,9 | 87,5 | 86,6 | 10,7 | 44,9 | 11,3 | 13,9 | 57,6 | 33,5 | 51,0 | 72,7 | 109,0 | 26,2 | |
| | Minimum | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 1,9 | 2,1 | 1,5 | 1,4 | 0,0 | 0,9 | 1,2 | 0,2 | 0,6 | 0,6 | |
| | Maximum | 2346,4 | 1767,2 | 16780,7 | 21141,0 | 9297,4 | 3054,1 | 5942,7 | 2648,6 | 3678,6 | 8361,9 | 543,5 | 1076,9 | 953,6 | 1992,8 | 618,1 | |
| | Percentiles | 10 | 0,1 | 0,1 | 0,1 | 0,2 | 0,1 | 86,6 | 76,8 | 73,8 | 82,9 | 71,1 | 5,9 | 5,3 | 5,2 | 4,5 | 4,7 |
| | | 25 | 1,0 | 0,9 | 1,0 | 0,9 | 0,8 | 127,4 | 128,3 | 117,0 | 130,5 | 121,0 | 9,2 | 7,7 | 7,2 | 7,4 | 7,9 |
| | 50 | 4,6 | 4,5 | 4,8 | 4,5 | 4,1 | 247,3 | 222,0 | 231,0 | 233,1 | 215,5 | 15,3 | 14,7 | 12,6 | 12,7 | 13,8 | |
| | 75 | 10,9 | 10,5 | 11,2 | 11,0 | 10,8 | 517,9 | 503,8 | 492,5 | 551,5 | 503,8 | 31,0 | 27,2 | 27,0 | 28,2 | 25,5 | |
| | 90 | 25,2 | 22,5 | 23,0 | 23,8 | 23,7 | 941,2 | 826,4 | 814,1 | 872,2 | 1020,6 | 65,4 | 75,6 | 80,2 | 72,2 | 76,5 | |
| X/NX | Percentiles | 10 | lower | lower | lower | lower | lower | lower | lower | higher | lower | higher | lower | higher | higher | higher | higher |
| | | 25 | lower | lower | lower | lower | lower | higher | higher | higher | higher | higher | lower | higher | higher | higher | higher |
| | | 50 | lower | lower | lower | lower | lower | higher | higher | higher | higher | higher | lower | higher | higher | higher | higher |
| | | 75 | lower | lower | lower | lower | lower | higher | higher | higher | higher | higher | higher | higher | higher | higher | higher |
| | 90 | lower | lower | lower | lower | lower | higher | higher | higher | higher | higher | higher | higher | higher | higher | higher | |

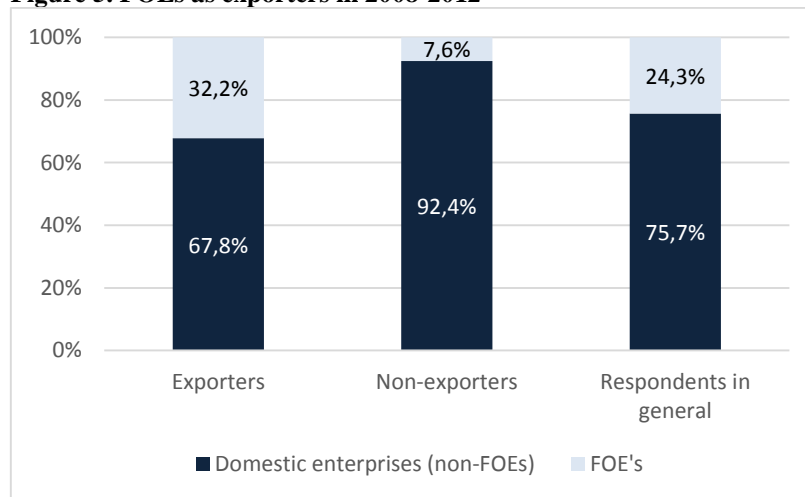
Source: Own elaboration, based on survey results. Note: lower – productivity is lower for exporters than for non-exporters; higher – productivity is higher for exporters than for non-exporters.

4. Foreign ownership and exports performance

One of the heterogeneity aspects is foreign capital presence in an enterprise. It is regarded as a first thought "suspect" when it comes to determinants of company's "behaviour" not only in the sphere of exports. As Antras and Yeaple (2014, p. 65) point it: "Both parents and the affiliates of multinational firms tend to be larger, more productive, more R&D intensive, and more export oriented than nonmultinational firms". There are many reasons why FOEs are "different" vs. domestic enterprises. Briefly, as it was formulated by Dunning, FOEs have: ownership, internalization and localization advantages (Dunning and Lundan, 2008). Some authors underline their superior technological position (Radosevic 1999, Cantwell 2000, Cantwell and Piscitello 1999, Cantwell and Iammarino 2011) or indicate their multi-face nature – beauty and the beast – and their specific functions as: dominators, coordinators, knowledge creators, networkers as well as political "creatures" (Forsgren 2008).

There were 24,3% respondents with foreign capital in the surveyed population. Their exports performance was subject of our inquiry. Foreign owned enterprises (FOEs) turned out to more export oriented. The difference between FOEs and domestic (non-FOEs) enterprises is presented on Figure 5.

Figure 5. FOEs as exporters in 2008-2012

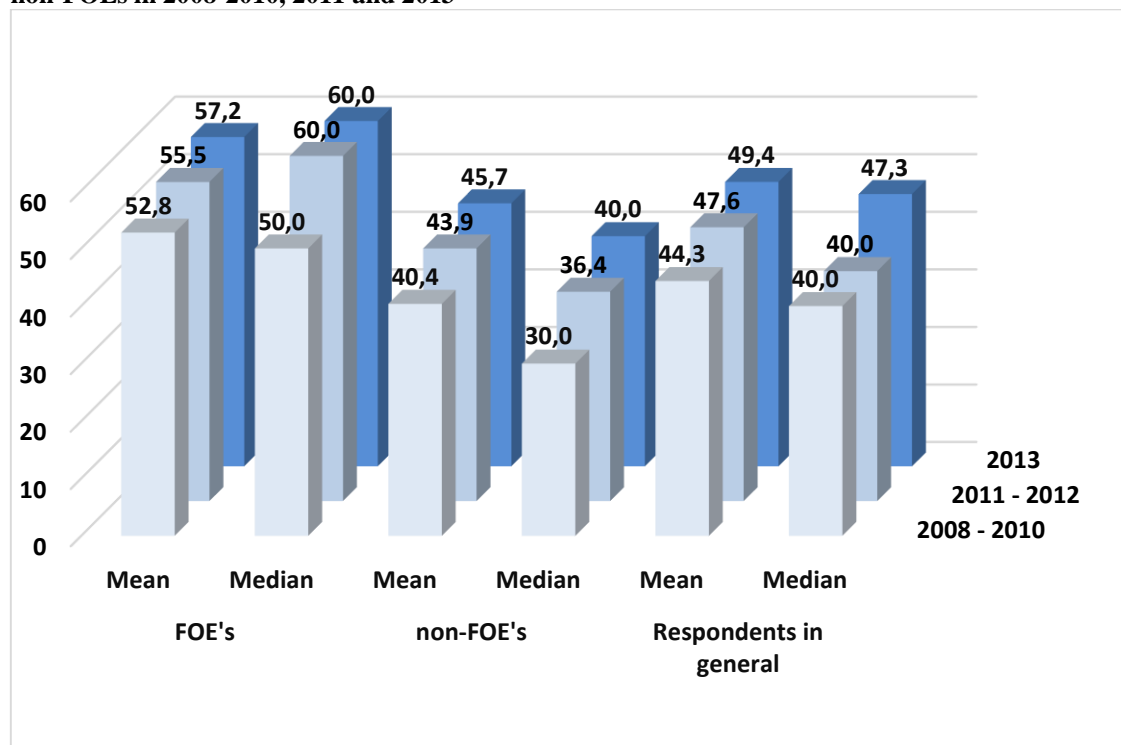


Source: Own elaboration, based on survey results.

Openness to foreign trade is an important aspect of both macro and micro analyses. Over the years, in the surveyed enterprises average exports to total sales ratio has increased: 44,3% in the 2008-2010 period, 47,6% in 2011-2012 and 49,4% for 2013 (a mean, for median the values are slightly lower). Statistically important differences can be seen if FOEs are compared to domestic enterprises. Exports share in total revenues from sales is higher in FOEs. The difference depends on the measure we take. Figure 6 shows these differences for 2008-2010, 2011 and 2013.

Export can be performed by an enterprise on more or less regular basis – or cannot be performed at all. A first observation is – as it was already mentioned – that FOEs relatively rarely declare to be non-exporters. When we focus on exporters, interesting and statistically important differences can be observed (see figure 7). Answers relate to period "after 2008" – it practically means timespan 2008-2013.

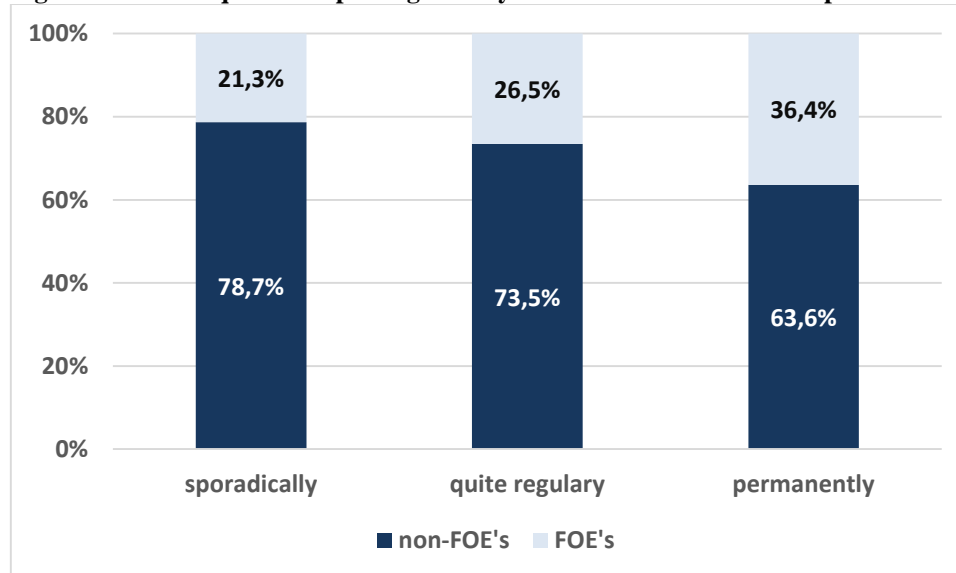
Figure 6. Exports share in total revenues from sales. Mean and median based comparisons for FOEs and non-FOEs in 2008-2010, 2011 and 2013



Source: Own elaboration, based on survey results.

Among respondents that declare exports as "sporadically performed activity", there are 21,3% of FOEs. Their share increases, as exports becomes more frequent activity of an enterprise. In a population of "permanent exporters", FOEs share is 36,4%.

Figure 7: How frequent is exporting activity? FOEs and non-FOEs comparison for period "after 2008"



Source: Own elaboration, based on survey results.

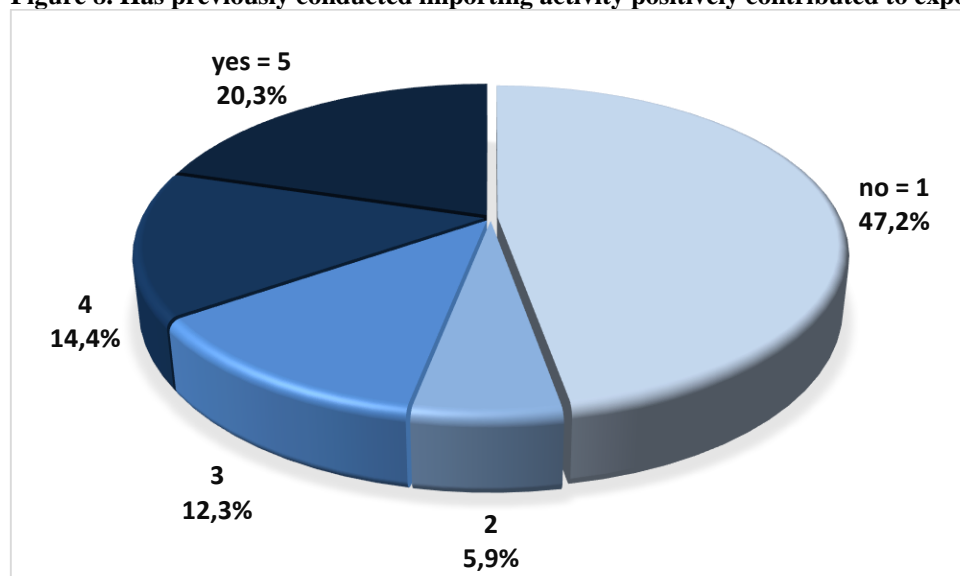
We also looked at FDI from another point of view. The question is how FDI done by the surveyed enterprises influence exports performance. We expected that if an enterprise possesses a foreign unit (and its share in it is more than 10 percent) it shall positively contribute to exports performance. Although there are many different motives of FDI, one of them may be export promotion. Although

some positive correlation can be seen, as average exports share in enterprises possessing an FDI is 55% (measured by median) – compared to 40% in non-FDI respondents – it turns out to be statistically insignificant.

5. Role of imports

Exporting activity is often very closely related to imports. Not all exporters are at the same time importers. Both types of foreign markets related activity do not have to be synchronized in time. Imports can be an initial, intermediary stage – on the way to exports. Importing can be associated with modernization processes, investments into new machinery and equipment etc. 432 respondents have given answer to the question "has previously conducted importing activity positively contributed to exports? The answer options were scalable: from 1, meaning "No", to 5, meaning "Yes". 47,2% of respondents declared that previously conducted importing activity has not positively contributed to exports. 20,3% of them have replied "very positively" (rank 5).

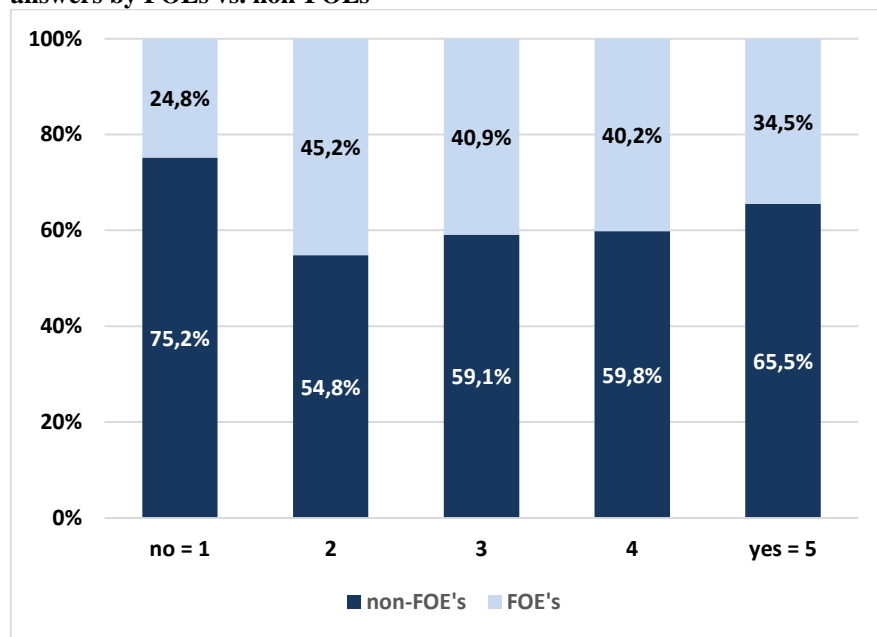
Figure 8. Has previously conducted importing activity positively contributed to exports?



Source: Own elaboration, based on survey results.

Answers to that question were filtered by form of ownership. Differences between FOEs vs. non-FOEs are statistically significant. V-Cramer coefficient equals 0,16 which proves "medium-strong" relation between participation of foreign capital and structure of answers to the question. FOEs share in the number of respondents who replied "No" equals 24,8%. Detailed structure of answers to this question is presented on a figure 9. In our opinion it shall be interpreted as follows: many of domestic respondents did not engage previously into importing activity. This is why they have so high share in the number of respondents that indicated "No". On the other hand, those who have experience in imports, positively reckon its contribution to exports competitiveness. Relatively few FOEs (24,8%) do not agree with opinion that previous imports positively contributed to exports. Thus many of them point positive contribution. However the strengths of this contribution – in their opinion – is not too huge. As they have experience in operation in foreign markets and in international business environment – they treat it as natural way of doing business. For non-FOEs, import as initial stage to exports is not as natural way of doing business. But those who went that way, did witness a strong, positive contribution of exports to competitiveness improvements.

Figure 9: Has previously conducted importing activity positively contributed to exports? Structure of answers by FOEs vs. non-FOEs



Source: Own elaboration, based on survey results.

6. Years in exports activity, number of markets served

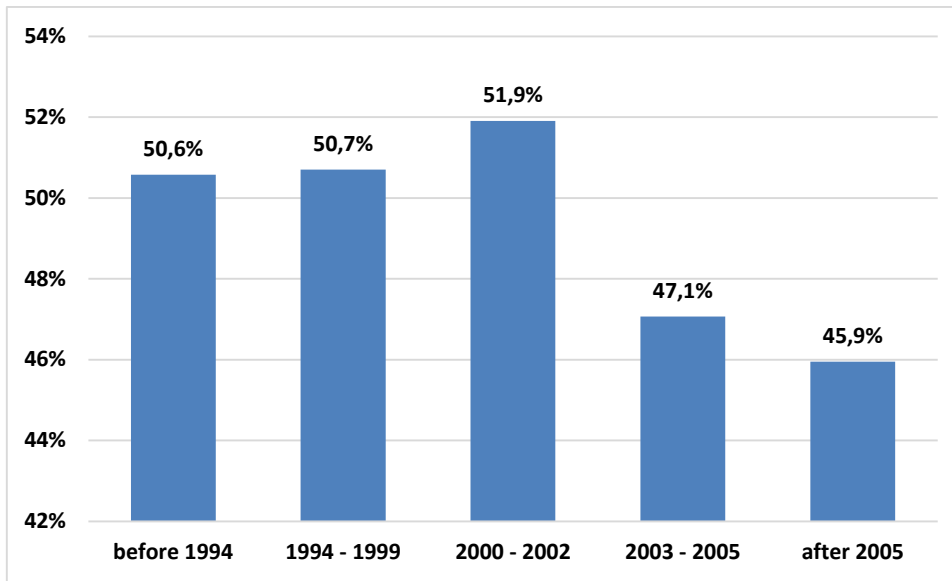
Exports performance is expected to be related to number of years in which an enterprise is doing exporting activity. Figure 10 shows correlation between years of doing exporting activity and average share of exports in total sales. The longer an enterprise is experienced in exports, the highest average share of foreign sales it total sales it has. The highest share of exports in total sales is observed for enterprises that were established in 2000-2002. It was a time of high expectations associated with anticipated membership in the EU and elimination of controls at borders with the EU countries. Slightly lower export share is observed for Respondents that started exporting earlier than 1994. Their relative lower exports maybe the results of several factors. Firstly, comparative advantage that an enterprise was relying on – has deteriorated. For instance technology, machinery or other assets – need improvements and new investments. Secondly, years of experience in exports has proven that too much exposure to exports is risky for an enterprise. Thirdly, in individual cases – depending on the sector, product, foreign destination market risk etc. – domestic market may have positively changed. Increased demand on it, combined with lower overall risk in comparison to servicing foreign markets, contributed to lower exports share in total sales.

It undoubtedly would desire more thorough inquiry, as the relation in statistical terms is not significant. However – as already stated – it would desire a case study approach.

Between 2008 and 2013 the average number of markets that are serviced by exporters have increased. In 2008 an average respondent was exporting to 7,1 markets (median was 4 markets); till 2013 it has increased to 9,3 markets (median was 5). Statistically significant differences can be seen as number of foreign markets served is crossed with years of experience with exports for 2013, not for 2008.

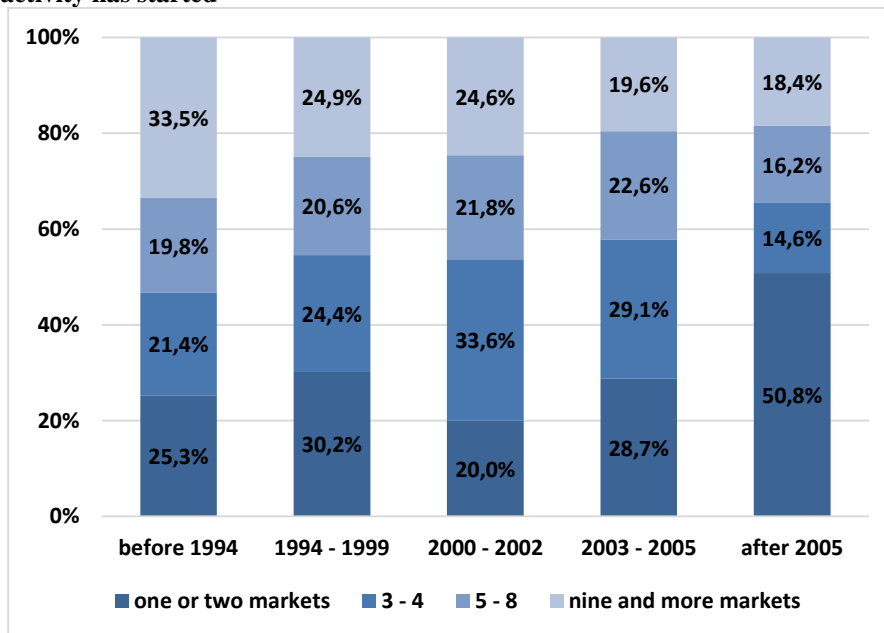
Respondents that have the longest experience in exporting – are servicing relatively the largest number of foreign markets. This can lead to general conclusion, that establishment of a solid exports base needs time and patience – having in mind that it depends on product characteristics.

Figure 10. Relation between years of doing business² in exports and average share of exports in total sales



Source: Own elaboration, based on survey results.

Figure 11. Relation between number of foreign markets serviced in 2008 and the year in which exporting activity has started



Source: Own elaboration, based on survey results.

7. Perception of exporting activity and its consequences

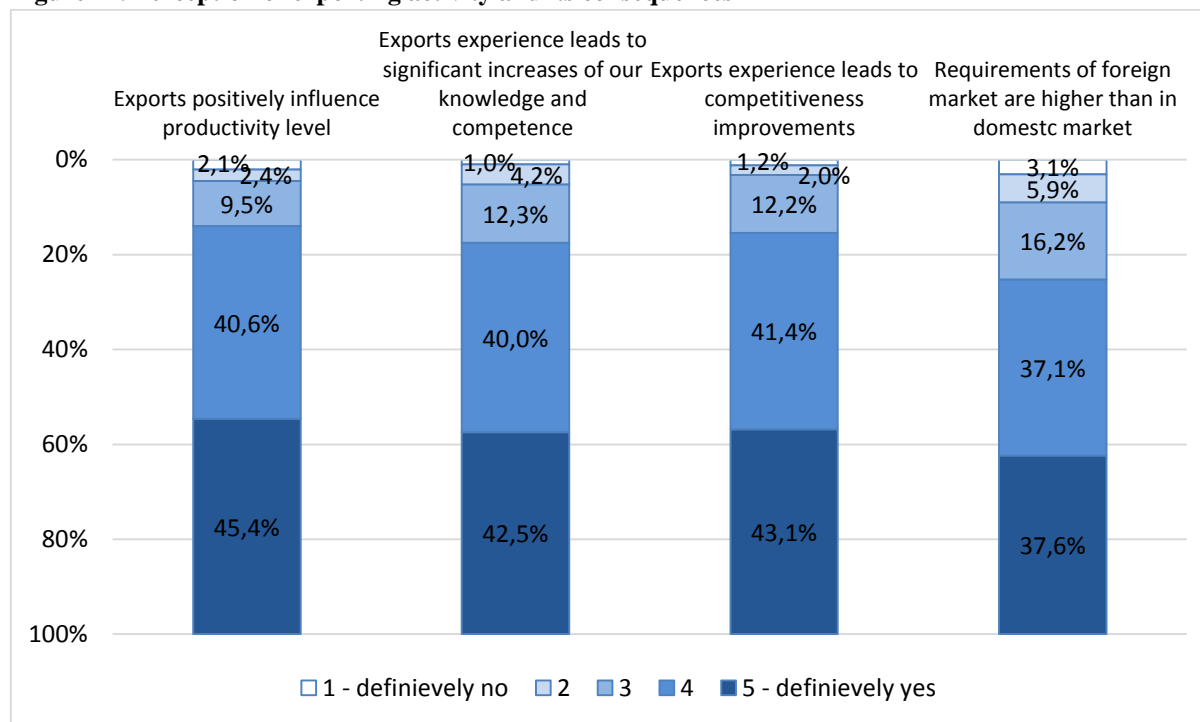
Consequences of exporting activity for enterprises' performance undoubtedly shall be assessed with reference to their financial situation, productivity and market shares. Such an approach would lead to objective, not biased conclusions. Our intention however was also to get to know opinion of respondents, as regards consequences of exporting activity and its perception. Respondents' opinions are presented

² The period within which an enterprise started exporting activity.

on the figure 12. The answer options were scalable: from 1, meaning "definitely No", to 5, meaning "definitely Yes".

Vast majority of respondents pointed options 4 and 5 to all the four statements that were subject of inquiry. Therefore they perceive exports as positively influencing productivity, significantly leading to increases of knowledge stock and competences and improving of overall competitiveness. As requirements of foreign markets are perceived to be higher than in domestic one (meaning that the former are more demanding than the last one) – the positive consequences occurred through "competitiveness effect". Exporting is not an easy activity. It requires additional efforts and costs to be carried. But it results in improvements of enterprises' performance.

Figure 12. Perception of exporting activity and its consequences



Source: Own elaboration, based on survey results.

8. Barriers and obstacles to exports

As it was already mentioned, our survey not only relates to questions strictly stemming from heterogeneity concept, understood as consequences of productivity differences for export performance. We also asked "other" sort of questions, focused on for instance barriers to exports as well as respondents' perception of their competitive position.

High competition is indicated by respondents as the most important barrier that either makes exports impossible or difficult to be increased (assessed 6.0 on scale from 0 to 10). Exchange rate risk is the second barrier (5.2) and not sufficient export promotion (5.1) – ranks third position. Other factors are assessed as being less important obstacles (see table 9).

In most of the cases, answers given by exporters and non-exporters are rather similar. Except for non-introduction of euro in Poland and high competition on foreign markets, all other factors are perceived as more severe barriers and obstacles by non-exporters than exporters. Significant differences between exporters and non-exporters occur in case of insufficient information about business opportunities in

foreign markets and also as regards inability to cooperate with other companies in entrance into foreign markets. It proves that as a company becomes an exporter, a sort of learning by exporting process takes place, that reduces "demand" for exports support, ability to cooperate with other companies increases and foreign languages competences increase.

Table 9. Barriers and obstacles that either make exports impossible (non-exporters) or difficult to be increased (exporters)

| Barrier/obstacle | Exporters | Non-exporters | All respondents | p-value* |
|--|-------------|---------------|-----------------|--------------|
| High competition on foreign markets | 6.04 | 6.01 | 6.03 | 0.913 |
| Exchange rate risk | 5.17 | 5.29 | 5.20 | 0.635 |
| Insufficient exports support | 5.01 | 5.21 | 5.07 | 0.397 |
| Insufficient information about business opportunities in foreign markets | 4.36 | 5.02 | 4.56 | 0.005 |
| Euro currency has not been introduced in Poland | 4.56 | 4.42 | 4.52 | 0.580 |
| Insufficient demand in foreign markets | 4.35 | 4.51 | 4.40 | 0.528 |
| Inability to cooperate with other companies in entrance into foreign markets | 3.79 | 4.32 | 3.95 | 0.033 |
| Lack of foreign languages by companies' personnel | 3.56 | 3.86 | 3.66 | 0.254 |

* for the test of significance of differences between exporters and non-exporters

Source: Own elaboration, based on survey results.

On scale from 1 to 5, high taxes (3.30), high competition (3.25) and increases of materials and components prices (3.16) are indicated as the most important obstacles to company further development. Relatively fewer problems are caused by such factors as equipment purchases, finding adequate personnel to be employed, financial liquidity and quality of "other" (non-transport) infrastructure in Poland.

Table 10: Obstacles to Respondents' economic activity and further development

| An obstacle | Exporters | Non-exporters | All respondents | p-value* |
|---|-------------|---------------|-----------------|----------|
| High taxes | 3.27 | 3.37 | 3.30 | 0.266 |
| High competition | 3.19 | 3.39 | 3.25 | 0.034 |
| Increases of prices of materials and components | 3.13 | 3.24 | 3.16 | 0.207 |
| Pressure on increases of wages, high labour costs | 2.85 | 3.05 | 2.91 | 0.042 |
| Lack of business support from the state | 2.73 | 2.93 | 2.80 | 0.061 |
| Unclear and changeable rules of doing business | 2.71 | 2.65 | 2.69 | 0.576 |
| Difficulties with sales in domestic market | 2.42 | 2.60 | 2.48 | 0.051 |
| Difficulties with sales in foreign markets | 2.51 | 2.22 | 2.41 | 0.003 |
| Lack of financial resources for investments | 2.32 | 2.52 | 2.38 | 0.030 |
| Exchange rates volatility | 2.61 | 1.90 | 2.38 | 0.000 |
| Transport infrastructure quality in Poland | 2.40 | 2.31 | 2.37 | 0.324 |
| Quality of other "non-transport" infrastructure in Poland | 2.39 | 2.33 | 2.37 | 0.493 |
| Low financial liquidity | 2.30 | 2.44 | 2.35 | 0.157 |
| Difficulties in finding adequate personnel | 2.30 | 2.28 | 2.29 | 0.855 |
| Difficulties in purchasing equipment | 1.91 | 2.10 | 1.97 | 0.032 |

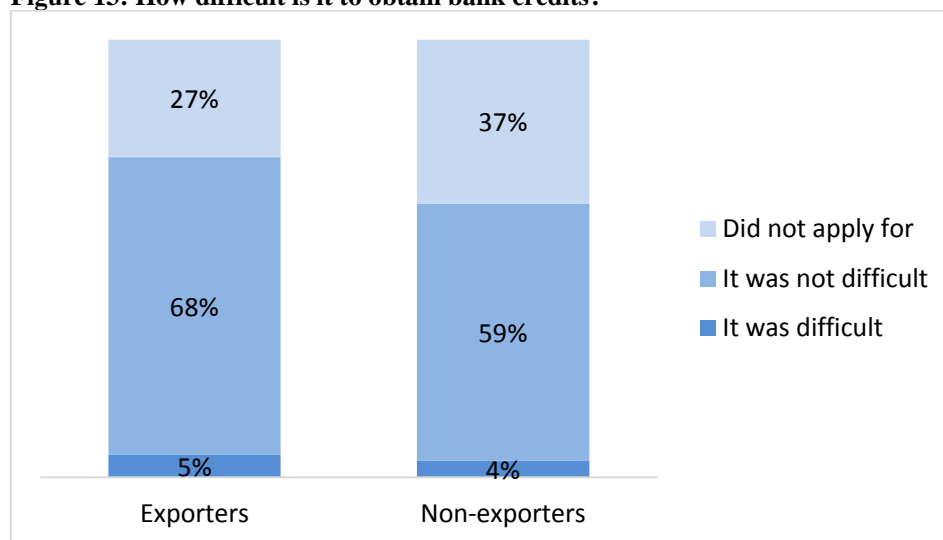
* for the test of significance of differences between exporters and non-exporters

Source: Own elaboration, based on survey results.

Exporters do not differ from non-exporters in average level of assessment of obstacles. Average score level is 2.60 for exporters and 2.62 for non-exporters. Significant differences occur in six categories. For exporters, exchange rates volatility is more acute obstacle as well as difficulties with sales in foreign markets. Non-exporters more frequently indicate high competition, pressure on wages increases as well as lack of financial resources for investments and difficulties in purchasing equipment.

Exporters more frequently use loans and credits – 27% of exporters declare they did not use this kind of financing (37% of non-exporters did not use). Among respondents that applied for credit, vast majority (93%) had not difficulties with successful obtaining it, mostly because of adequate creditworthiness.

Figure 13: How difficult is it to obtain bank credits?



Source: Own elaboration, based on survey results.

Respondents were asked to express their opinion about competition perception. The most severe competition is declared to be from other companies from Poland (rank 3,38 on scale 1-5). Competition from the side of foreign companies is perceived as less dangerous. What is interesting, respondents assess competition from low labour costs countries as less acute (see table 11).

Table 11. Assessment of competitors' strength by categories of countries

| Where are competitors from? | Exporters | Non-exporters | All respondents | p-value* |
|--|-----------|---------------|-----------------|----------|
| Companies from Poland (PL) | 3.20 | 3.76 | 3.38 | 0.000 |
| "Old" member states of the EU (Old EU) | 3.11 | 2.20 | 2.82 | 0.000 |
| "New" member states of the EU (New EU) | 2.76 | 1.98 | 2.51 | 0.000 |
| Low labour costs countries (as for instance China, India etc. – CN/IN) | 2.68 | 1.87 | 2.42 | 0.000 |

* for the test of significance of differences between exporters and non-exporters

Source: Own elaboration, based on survey results.

As regards perception of the competitive threat, exporters differ from non-exporters. Positions of particular competitors are the same – however the scale of answers is different. For exporters, competing companies from Poland (3.20) are seen only little more competitive than companies from the "old" member states of the EU (3.11). The non-exporters' answers range is larger (for companies from Poland 3.76 and from "old" EU member states 2.20). Generally, non-exporters assess competitive pressure intensity to be higher than non-exporters.

A detailed structure of competitors' strengths – as perceived by respondents – is presented in table 12. In case of "other companies from Poland", these are predominantly: elasticity in doing business, time accuracy (timeliness) and fast business action. As regards companies from "old" EU member states, their strengths are: reputation of company and brand recognition, technological level, marketing and pro-ecological orientation. "New" EU member states competitors' main strength is low costs. In case of low costs countries, apart from obvious low costs, also low prices of products are perceived as strength.

Table 12: Structure of competitors' strengths assessment by categories of countries and competitiveness factors (in per cent)

| Competitiveness factor | Exporters | | | | Non-exporters | | | | All respondents | | | | p-value* | | | |
|---|-----------|--------|--------|-------|---------------|--------|--------|-------|-----------------|--------|--------|-------|----------|--------|--------|-------|
| | PL | Old UE | New UE | CN/IN | PL | Old UE | New UE | CN/IN | PL | Old UE | New UE | CN/IN | PL | Old UE | New UE | CN/IN |
| Technological level of products and services offered | 35 | 47 | 17 | 5 | 54 | 33 | 11 | 3 | 41 | 42 | 15 | 4 | .00 | .00 | .06 | .16 |
| Quality of products and services offered | 38 | 45 | 17 | 3 | 63 | 26 | 11 | 1 | 46 | 39 | 15 | 2 | .00 | .00 | .06 | .12 |
| Attractiveness and modernity of products and services offered | 34 | 45 | 20 | 5 | 57 | 26 | 13 | 4 | 41 | 39 | 18 | 5 | .00 | .00 | .02 | .61 |
| Low costs of production or rendering of services | 32 | 17 | 30 | 40 | 55 | 10 | 18 | 27 | 39 | 15 | 26 | 36 | .00 | .02 | .00 | .00 |
| Fast business action | 40 | 38 | 16 | 10 | 65 | 21 | 9 | 7 | 48 | 32 | 14 | 9 | .00 | .00 | .01 | .18 |
| Brand recognition and reputation of company | 33 | 53 | 13 | 2 | 61 | 27 | 10 | 2 | 42 | 45 | 12 | 2 | .00 | .00 | .22 | .96 |
| Pro-ecological features of products and services offered | 33 | 47 | 18 | 3 | 56 | 26 | 17 | 1 | 40 | 40 | 18 | 3 | .00 | .00 | .70 | .08 |
| Product differentiation and wide scope of products and services offered | 39 | 39 | 15 | 10 | 58 | 26 | 11 | 6 | 45 | 35 | 13 | 9 | .00 | .00 | .21 | .05 |
| Price of products and services offered | 38 | 20 | 16 | 29 | 62 | 13 | 5 | 19 | 45 | 18 | 13 | 26 | .00 | .02 | .00 | .01 |
| After-sale services, conditions of guarantee offered | 41 | 43 | 15 | 3 | 62 | 28 | 9 | 3 | 48 | 38 | 13 | 3 | .00 | .00 | .03 | .86 |
| Differentiation of distribution modes | 38 | 42 | 17 | 5 | 60 | 26 | 12 | 3 | 45 | 37 | 16 | 4 | .00 | .00 | .05 | .40 |
| Time accuracy of deliveries | 42 | 43 | 16 | 3 | 69 | 23 | 6 | 2 | 50 | 37 | 13 | 3 | .00 | .00 | .00 | .43 |
| Elasticity in doing business, openness to customers' needs | 49 | 31 | 18 | 7 | 65 | 22 | 11 | 3 | 54 | 28 | 16 | 6 | .00 | .02 | .01 | .02 |
| Efficient marketing and modern forms of promotion | 35 | 45 | 19 | 5 | 55 | 32 | 12 | 2 | 41 | 41 | 17 | 4 | .00 | .00 | .02 | .04 |
| Ability to cooperate with other companies | 40 | 39 | 19 | 5 | 58 | 30 | 11 | 2 | 45 | 36 | 16 | 4 | .00 | .02 | .01 | .10 |
| High adaptability to changeable situation | 38 | 38 | 19 | 5 | 61 | 25 | 12 | 2 | 45 | 34 | 17 | 4 | .00 | .00 | .01 | .06 |
| The way in which company is managed and organized | 38 | 42 | 19 | 5 | 61 | 26 | 11 | 2 | 45 | 37 | 16 | 4 | .00 | .00 | .02 | .03 |
| Knowledge of market that company operates on | 36 | 43 | 17 | 6 | 61 | 28 | 10 | 2 | 44 | 38 | 15 | 5 | .00 | .00 | .02 | .02 |

* for the test of significance of differences between exporters and non-exporters

Source: Own elaboration, based on survey results.

In most of the cases, exporting companies see competitors' in a different way than non-exporters. On an average, companies from EU "old" member states are perceived to be more competitive (average score 40%, in comparison with 25% as declared by non-exporters), EU "new" member states (average score 18% and respectively 11%), China and India (9% and 5%) and too less extent comparative advantages of domestic (Polish) competitors (average score 38%, in comparison with 60% as declared by non-exporters).

Taking into account respondents' answers relative to average, we can formulate following conclusions:

- Exporters see elasticity and time accuracy (timeliness) as main strengths of their domestic competitors. As regards EU "old" members these are: brand recognition and pro-ecological orientation. For "new" EU: modernity and low costs.
- Non-exporters assessment of domestic competitors is similar as in the case of exporters, with the little difference that timeliness is main strength. In EU "old" member states they point technological level (that exporters did not reckon so high) and marketing. As for "new" EU members, non-exporters see low costs and pro-ecological attitude.
- Both – exporters and non-exporters – in a similar way see low cost countries strengths, as: (apart from low costs): low prices, fast business action and product differentiation.

9. Concluding remarks

As access to individual business units' data in Poland is virtually impossible, we decided to combine large survey results with detailed financial data obtained from InfoCredit. In that way we have compared not only general characteristics of exporters vs. non-exporters, but also confronted them with measures of productivity.

We have identified significantly important differences in innovation attitude and behaviour of exporters vs. non-exporters. Exporters proved to be more focused on innovations, are more aware of the need to implement changes, and are better prepared to introduce them in reality. They are more probable to be creative (constantly introduce change) and are more likely to behave in more strategic manner (ad hoc innovators) taking position of market leaders than non-exporters. These observations are in line with theoretical predictions. Foreign markets are more demanding, thus companies that operate on them see innovation as a way to gain competitive edge.

Exporters are usually more productive than non-exporters. This is the central notion of firm heterogeneity literature. We have utilized three measures of productivity in our comparisons: labour productivity, total productivity and TFP. Generally speaking, the distribution of productivity is in line with our expectations – significantly skewed to the right. Firms with low productivity levels dominate. There are at the same time very few firms with high productivity. We have to stress that at first sight it is difficult to spot the differences in productivity distribution between exporters and non-exporters, however, distributions differ between the measures. Thus more sophisticated statistical measures were utilized. Depending on productivity measure, differences between exporters vs. non-exporters are statistically significant (labour productivity) or close to significance (total productivity). With productivity clearly higher for exporters. This is in line with our expectations and evidence provided in recent years for numerous countries. However, the significance of differences measured by TFP depends on the period of evaluation. In the crisis years, TFP levels for exporters are lower than for non-exporters. This to some extent can be considered as an indirect proof of severity of the crisis with adversely negative impact on performance of exporters which are naturally more exposed to external economic shocks than non-exporters. Without doubts we need to use more sophisticated econometric techniques in order to further investigate the topic.

Another aspect of inquiry into firm heterogeneity is performance of foreign owned companies (vs. domestic ones). Foreign direct investors are often described as agents of globalisation, international coordinators and "networkers" – their activity leads to trade stimulation. FOEs are more export oriented (have higher exports share in total sales than non-exporters), relatively rarely declare to be non-exporters and simultaneously their share in the group of permanently exporting companies is high.

As regards years in exporting activity (which can be treated as a proxy of experience) there is no statistically significant correlation with average share of exports in total sales. On the other hand, exporting duration, clearly increases the number of foreign markets served.

At the same time, it is interesting to see how respondents perceive exporting. They mostly declare it to have positively influenced their productivity, increased stock of knowledge and competence, and overall competitiveness. These aspects need further research as respondents' perceptions shall be confronted with their actual performance.

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