

The effect of the degree of foreign ownership on firms' performance

Aneta Bobenič Hintošová, Zuzana Kubíková¹

Abstract: A large number of studies have compared the performance of foreign-owned and domestic firms. However, only a limited number of studies have investigated the effect of the degree of foreign ownership on a firm's performance. We attempt to fill this gap in the literature by conducting research that distinguishes not only between domestic and foreign-owned firms, but also between wholly and partly foreign-owned firms. We also examine the possible non-linearity of the performance-ownership relationship. We divide the firms in our study into three groups by their ownership - domestic, foreign, and joint ventures. We use a regression analysis to explore whether foreign ownership influences the firms' performance, measured by several variables such as profitability, innovation performance (measured by gross expenditures on research and development activities), numbers of employees involved in research and development, production, value added, leverage and net working capital intensity. The results of our research indicate that there is a statistically significant difference in firms' performance as a result of foreign ownership in all variables except the number of research and development employees and leverage. Moreover, we show that foreign ownership and performance are linked by an inverted U-shaped relationship. A firm's performance increases with greater foreign ownership up to the range of 61-65 %, and declines thereafter.

Key words: performance, foreign ownership, foreign investor, joint ventures, Slovak republic

JEL Classification: F23, G32, L25

Received: 30 June 2015 / Accepted: 29 January 2016 / Sent for Publication: 11 March 2016

Introduction

It is generally stated that the catching-up process in Central and Eastern Europe has coincided with large inflows of foreign direct investment (FDI) (Bijsterbosch, Kolasa, 2010). The result of this process is that around 44 % of firms operating in the industry of Slovak Republic are wholly or partially foreign-owned. Central and Eastern European countries have been persistently trying to enhance the attractiveness of their invest-

¹ University of Economics in Bratislava, Faculty of Business Economics with seat in Košice, Department of Management, Tajovského 13, 041 30 Košice, Slovakia. E-mail: aneta.bobenic-hintosova@euke.sk, zuzana.kubikova@euke.sk

ment environment since the 1990s. In particular, the policy supporting FDI in these countries is analysed by Drahekoupil (2008), who refers to competition among these countries in this regard. These aspects are also elaborated by Šestáková (2008), who shows that over-intense competition among countries to attract foreign investments (so-called competition to the bottom in the field of fiscal and financial incentives), can have negative consequences for the national economy in the long term. In order to optimize investment promotion policy, it is necessary to verify the compliance with the generally accepted assumption that foreign-owned companies achieve higher performance than domestic-owned companies, in the current conditions in the Slovak Republic.

The purpose of this paper is to examine the role of foreign ownership in enhancing a firm's performance. In our research we do not only distinguish between foreign and domestic ownership, but also consider mixed ownership. Greenaway, Guariglia, and Yu (2014) proved that some domestic ownership in firms owned by foreign investors is necessary in order to ensure optimal performance. Similarly, we attempt to identify whether the degree of foreign ownership matters for performance of firms operating in the Slovak Republic. We test this hypothesis on a sample of more than 2,000 observations from domestic-owned, foreign-owned and jointly-owned firms operating in the Slovak Republic from 2004 to 2013. We consider firms operating in the Slovak Republic an appropriate sample for this research, because both joint ventures and wholly foreign-owned firms coexist in the Slovak market. This makes studying the impact of the degree of foreign ownership on these firms' performance relevant. The methodology used in this paper, namely a T-test for equality of means and a regression analysis, help to produce detailed results.

In addition to the usual performance measurement - return on sales, other performance variables that indicate a firm's performance are also taken into account in this paper; these include gross expenditures on research and development activities, numbers of employees involved in research and development, leverage, net working capital intensity, value added and production.

The rest of the paper is organized as follows: section 2 presents the theoretical framework underlying our empirical analysis, section 3 introduces the data and variables and explains the empirical methodology, and section 4 discusses the empirical findings, while section 5 offers conclusions.

Literature Review

A large number of studies have compared the performance of foreign-owned and domestic firms. Despite the generally accepted hypothesis that foreign-owned firms outperform domestic firms in many financial and production measures, several authors have proved the opposite in their research; opinion on this matter is therefore divided (Azzam, Fouad, Ghosh, 2013).

A first group of authors suggest that foreign-owned firms can possess firm-specific advantages that are not available to domestic firms, and thus achieve superior performance (Caves, 2007). Huang and Shiu (2009) state that foreign investors may have better technological, financial, or human expertise, experience, or resources, which give them more credibility and a stronger reputation than domestic entrepreneurs.

Superior financial performance had already been identified among foreign-owned firms compared to domestic firms by Willmore (1986), who analysed 282 pairs of Brazilian firms and showed that the foreign-owned firms had higher ratios of value added to output and greater capital intensity. These findings were confirmed by Doms and Jensen (1995) for the United States, where foreign-owned manufacturing plants had superior operating characteristics, were more capital and technology intensive, and were more productive relative to average domestic plant. Kim and Lyn (1990) found that foreign firms in the United States spent more on research and development, and had higher debt levels. A study of Indian firms made by Chhibber and Majumdar (1999) proved that firms with foreign ownership displayed relatively superior performance when return on sales was used to measure performance. Arnold and Javorcik (2005) analysed the causal relationship between foreign ownership and plant productivity in Indonesia, and suggested that foreign ownership led to significant productivity improvements in the acquired plants. Aydin, Sayim and Yalama (2007) analysed Turkish firms and demonstrated that foreign ownership had a positive impact on financial performance. In their study of SMEs operating in the Greek manufacturing sector, Halkos and Tzeremes (2010) derived the general conclusion that foreign ownership had a positive impact on foreign equities' performances. Meanwhile, Goethals and Ooghe (1997) compared the performance of Belgian companies that had been taken over by domestic or foreign firms, and concluded that foreign takeovers had no negative influence on performance. In addition, superior performance of foreign firms was reported in developing countries by Boardman, Shapiro, Vining (1997), and Lecraw (1984).

On the other hand, a second group of authors have proven that domestic firms achieve better performance than foreign-owned firms. Domestic entrepreneurs may be more knowledgeable about the local environment than foreign investors (Huang, Shiu, 2009), which may eventually lead to better performance. Aitken and Harrison (1999) used a panel of more than 4,000 Venezuelan firms and found that an increase in foreign ownership negatively affected the productivity of wholly domestic firms in the same industry. A study by Kim and Lyn (1990) indicated that foreign firms in the United States were less profitable than randomly selected domestic firms. Barbosa and Louri (2005) found that there was no significant difference in performance between domestic and foreign-owned firms in Portugal. Similar results were also reached by Konings (2000), who found no evidence of foreign-owned firms performing better than domestic ones in Bulgaria and Romania. In the Czech Republic, Zemplerová (2010) showed that a negative relationship exists between foreign ownership and firms' numbers of R&D employees.

All these findings raise a question: why are such ambiguous results found when studying the relationship between foreign ownership and firms' performance? Barbosa and Louri (2005) mentioned in their paper that the results may be country-specific, and the same was noted by Gelübcke (2013). However, country-specificity is probably not the only reason for these widely varying findings; they may also be caused by the fact that joint ventures were not taken into account in these studies. Most of these previous studies distinguish only two types of ownership - domestic or foreign. A number of them use a dummy variable to measure the foreignness of the firm (Barbosa, Louri, 2005; Zemplerová, Hromádková, 2012), which takes value 1 if ownership is foreign, and

zero otherwise. This method does not account for a degree of foreignness in jointly-owned firms.

Only a limited number of studies have investigated the effect of the degree of foreign ownership on firms' performance. Blomström and Sjöholm (1998) used Indonesian micro data from 13,664 establishments to try to answer the question of whether establishments with minority and majority of foreign ownership differ in terms of productivity levels. They found that the degree of ownership did not affect the level of labour productivity.

Different results were achieved by Greenaway, Guariglia, and Yu (2014), who examined the relationship between the degree of foreign ownership and performance in Chinese firms, and found that joint ventures perform better than both wholly foreign-owned and wholly domestic firms. Though productivity and profitability initially rose with foreign ownership, they began to decline once foreign ownership reached 64 %. Therefore, the authors suggested that some domestic ownership is necessary to ensure optimal performance, and rationalize these findings with a model of an inverse U-shaped ownership-performance relationship.

Similarly, Akimova and Schwödiauer (2004) measured ownership structure by the percentage of shares held by each type of owner in medium and large Ukrainian firms and their results showed that the impact of foreign ownership on performance is non-linear: its effect is positive only up to a certain level, which falls short of majority ownership. According to the authors, this non-linearity is caused by an institutional environment which is adverse to foreign investors.

However, these studies are not sufficiently comprehensive in their approach to the relationship between degrees of foreign ownership and a firm's performance. In this paper, we try to fill the gap in the literature by conducting further research that does not only examine domestic and foreign-owned firms but also partially foreign-owned joint ventures.

Data and Methodology

Our main interest was in examining the ownership – performance relationship of firms operating in industry in the Slovak Republic, because a huge volume of foreign direct investment inflows was directed to industry in recent years. Nowadays, around 44% of industrial firms in the country have foreign capital participation. According to the Statistical Classification of Economic Activities SK NACE Rev. 2, the sector we study covers divisions from 05 to 39.

The data were collected from the database of the Statistical Office of the Slovak Republic, which publishes annual reports based on data submitted by firms with 20 or more employees, whose main activity is in industry, as well as firms with up to 19 employees, but whose yearly turnover exceeds 5 million Euros. The final sample of firms contains data from both reports – the Industry Yearbooks and Yearbooks of Science and Technology – and consists of more than 2,000 observations of firms in Slovakia for the period 2004-2013.

We divided the investigated firms into three groups according to their ownership type: domestic, where the ownership was purely private inland; foreign, where the owner of firm was one or more foreign investor(s); and joint ventures, where ownership was mixed and consisted of investments from both foreign investors and from domestic entrepreneurs.

Foreign ownership forms the independent variable in this paper (OWNERSHIP), and it is measured by the percentage of equity shares owned by foreign investor(s). This is a common way to measure foreign ownership, and was for example used by Aitken, Harrison (1999), Akimova, Schwödiauer (2004), Chhibber, Majumdar (1999), Halkos, Tzeremes (2010), Greenaway, Guariglia, Yu (2014), and Konings (2000).

Description of dependent variables

The main dependent variable we worked with in this paper was the firms' performance. This is usually examined using financial analysis tools, mainly ratios (Suchánek, Špalek, 2012). Several variables were used as measures of performance, which is common practice, as mentioned in the literature review. As Suchánek, Richter, and Králová (2014) state, many authors use a range of specifically constructed sets of indicators to evaluate companies' performance. We examined financial performance generally measured by profitability, as well as innovation performance, production, value added, leverage, and net working capital intensity.

Profitability measures can appear in several forms (Tangen, 2003). One of the most common measures is return on sales (also known as profit margin), which determines, according to Ross, Chambers and Johnston (2002), the firm's ability to withstand competition and adverse rising costs, falling prices or declining sales in the future. In this paper, we used return on sales (ROS) as the profitability measure, which is computed as profit before depreciation, interest, and taxes as a ratio of sales. Chhibber and Majumdar (1999) used the same computation of return on sales in their research.

Innovation performance was measured by gross expenditures on research and development activities (GERD), and the number of employees involved in research and development (R&D employees). Expenditures on R&D have previously been used to study performance by, for example, Grabowsky and Mueller (1978) and Gelübcke (2013), while Zemplerová and Hromádková (2012) state that the number of R&D employees is an important indicator of innovation performance.

Liu, Parker, Vaiyda, and Wei (2000) defined the capital intensity variable as the ratio of the net value of firm's capital to its number of employees. Hence, we calculated capital as stock, trade receivables and rendered advances less trade payables, and divided this by the number of employees, to obtain the net working capital intensity (NWC) variable.

To calculate leverage, many studies have used either the ratio of short- and long-term debt to net worth (Dimelis, Louri, 2002) or the ratio of total liabilities to total assets (Greenaway, Guariglia, Yu, 2014). In this paper, leverage (LEVERAGE) is calculated as trade payables, which represents short-term debt over basic capital.

We also used production and value added variables in the form of the plant scale measures that were similarly used by Willmore (1986), Howenstine and Zeile (1994).

Before reporting our results for the firms' performance-ownership relationship, we introduce the descriptive statistics of the dependent variables for our three groups of firms: domestic, foreign firms and joint ventures. These describe which group prevails on average over the rest in particular performance variables.

Table 1 Descriptive statistics

Variable	Domestic firms		Foreign firms		Joint Ventures	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
GERD	42 526	12 093	93 726	49 803	119 851	68 584
R&D employees	1.83077	0.36474	1.64041	0.49984	2.00446	0.48975
LEVERAGE	0.50799	0.12978	0.88429	0.11926	0.63718	0.12341
PRODUCTION	7 766 770	788 028	42 677 200	7 294 300	59 063 600	11 584 600
ROS	0.02025	0.00584	0.02088	0.01105	0.03175	0.00675
NWCI	9 594	1 643	16 016	2 537	18 280	5 869
VALUE ADDED	1 996 990	189 396	7 287 770	807 874	10 400 900	1 967 690

Source: Own processing

Table 1 reports means and standard deviations for the variables used, for domestic firms, foreign firms, and joint ventures. These descriptive statistics reveal that joint ventures spend the most money on average on gross expenditures on R&D activities, while foreign firms spend on average more than twice as much in this area than domestic firms do. Joint ventures have also the largest number of R&D employees, but the lowest numbers of R&D employees are found in foreign firms. Foreign firms are the most indebted, and domestic firms have the lowest level of leverage on average. In terms of production, joint ventures produce the most, followed by foreign firms; domestic firms produce only one sixth of the foreign firms' production. The highest return on sales is achieved by joint ventures, while domestic firms have only slightly worse results in this area than foreign firms. When we focus on net working capital intensity, joint ventures are the most intensive of the three groups of firms; domestic firms are only half as intensive compared to them. Joint ventures have the highest value added, followed by foreign firms, while domestic firms have less than one fifth of the value added observed among joint ventures.

Empirical methodology

At first, we use a *T-test for equality of means* to test the null hypothesis that the means of each two from the three groups of firms are equal. After controlling for the normality of our samples using the *Jarque-Bera test* (Jarque, Bera 1980), we then test the equality of variances between the samples using the *variance test* (Moser, Stevens 1992). When the variances of the two samples are assumed equal, we used *Student's t-tests for equality of means* (Student, 1908), otherwise *Welch's t-test for equality of means* (Welch, 1947) is used.

Moreover, a regression analysis is conducted to study the relationship between the firms' performance and their ownership. The following regression model is used to evaluate the influence of foreign ownership on performance measures:

$$Y = f(OWNERSHIP, OWNERSHIP^2)$$

We suppose that the particular performance measure (Y) for each firm is influenced by the firm's ownership, and we expect this influence to be non-linear. Other parameters with possible influence on the dependent variable are reflected in the residual in the estimation results.

We estimate the parameters of independent variable *OWNERSHIP* using the OLS method, as used by many authors studying the relationship between foreign ownership and performance (e.g. Yasar, Paul, 2009; Javorcik, 2004; Blomström, 1988; Brown, Earle, Telegdy, 2006; Gelübcke, 2013). The functional form of the regression model for our data set is:

$$Y_{it} = \alpha \cdot const + \beta_1 \cdot OWNERSHIP + \beta_2 \cdot OWNERSHIP^2 + \varepsilon_{it}$$

for each of the above-described variables measuring the firms' performance. The dependent variable Y_{it} refers to the vector of performance measures, namely return on sales (ROS), gross expenditures on research and development activities (GERD), numbers of employees involved in research and development (R&D employees), net working capital intensity (NWC), leverage (LEVERAGE), production (PRODUCTION), and value added (VALUE ADDED). ε_{it} is the error term and α , β , are vectors of the parameters to be estimated using the OLS method. i and t are firms and time subscripts.

OWNERSHIP represents the independent variable that is measured by the percentage of equity shares owned by foreign investor(s). To address the possible non-linear relation between foreign ownership and performance mentioned by Akimova and Schwödiauer (2004), we added squared values of variable *OWNERSHIP* into the regression (*OWNERSHIP*²). Greenaway, Guariglia, and Yu (2014) used the same variable to deal with the possible non-linearity of the relationship between performance and foreign ownership.

Empirical Results

The t-tests for equality of means test the possible differences between domestic and foreign firms, foreign firms and joint ventures, and joint ventures and domestic firms. Unequal means between the groups of domestic and foreign firms or domestic firms and joint ventures would imply that performance differences exist and are caused by foreignness. Furthermore, if the means of the performance measures are unequal between joint ventures and foreign firms, and joint ventures perform better than foreign firms, then this would suggest that some domestic participation benefits the firm's performance. Table 2 contains the t-test results for the equality of means among the three groups of firms.

Table 2 Testing statistics

Variable	GERD	R&D employees	LEVERAGE	PRODUCT.	ROS	NWCI	VALUE ADDED
T-test* for equality of means between:	Domestic firms						
	-3,15916 (0,01010)	0,97287 (0,34351)	-6,75132 (0,00000)	-15,04700 (0,00000)	-0,16125 (0,87370)	-4,50683 (0,00000)	-20,1631 (0,00000)
	Foreign firms						
	-0,97471 (0,34262)	-1,64514 (0,11729)	4,55332 (0,00025)	-3,78519 (0,00136)	-2,65478 (0,01613)	-1,11949 (0,28440)	-4,62824 (0,00059)
	Joint Ventures						
	3,51114 (0,00602)	0,89947 (0,38028)	2,28121 (0,03493)	13,97040 (0,00000)	4,07755 (0,00071)	4,50683 (0,00102)	13,4438 (0,00000)
	Domestic firms						

* The value in parentheses is the p-value for the t-tests

Source: Own processing

The t-tests show that the majority of variables exhibit considerable differences among the studied groups of firms at the significance level $\alpha = 0.05$. The number of R&D employees is the only variable where no differences are found in any of the studied pairs of firm types. Hence, the average number of employees in innovation is equal irrespective of the firm's ownership; foreignness does not appear to have an impact on this variable.

In addition, the means are equal between foreign firms and joint ventures when we consider gross expenditures on R&D activities. That suggests that presence of a foreign investor in a firm is important for deciding on innovation expenditures, but that the extent to which that foreign investor controls the firm is not so important. The same stands for net working capital intensity, according to the t-tests.

Equal means are found between domestic and foreign firms for return on sales. This result suggests that a domestic firm's average profitability is not statistically different from the average profitability of a foreign firm at significance level $\alpha = 0.05$. However, t-tests between joint ventures and these two groups of firms show a statistically significant difference. In other words, even if there is no difference between purely domestic and wholly foreign-owned firms, there is a noticeable difference in profitability when a firm has mixed ownership.

For the other variables, we report statistically significant differences in means of all groups, and so we are able to confirm the generally accepted hypothesis that firms' performance differs due to their foreignness. As the descriptive statistics above show, the mix of domestic and foreign ownership in joint ventures is beneficial. With the exception of variable leverage, joint ventures display the best average values in all performance measures. Furthermore, the t-tests prove that the differences between joint ventures and the other two groups of firms are statistically significant. These findings are in line with results reported by Greenaway, Guariglia, and Yu (2014), Akimova and Schwödiauer (2004).

For a better understanding of the performance-ownership relationship, we conducted a regression analysis using the OLS method for parameter estimation. The results of the analysis, reported in Table 3, show that foreign ownership has a statistically significant influence on the variables GERD, NWCI, PRODUCTION, ROS, and VALUE ADDED.

Table 3 OLS estimates

<i>Variable</i>	OWNERSHIP	OWNERSHIP²	Const.
GERD	2 581 080*** (0.0032)	-20 691** (0.0118)	42 523 300** (0.0113)
LEVERAGE	0.0014 (0.4891)	0.0000 (0.2310)	0.508*** (0.0000)
NWCI	283*** (0.0001)	-2.190*** (0.0010)	9 593*** (0.0000)
PRODUCTION	1 702 820*** (0.0000)	-13 537*** (0.0000)	7 765 060*** (0.0000)
R&D employees	-0.1092 (0.3351)	0.0007 (0.5304)	5.663** (0.0151)
ROS	0.0005*** (0.0004)	0.0000*** (0.0040)	0.020*** (0.0000)
VALUE ADDED	285 985*** (0.0000)	-2 335*** (0.0000)	1 995 620*** (0.0000)

*Asterisks *, **, *** indicate statistical significance of coefficients at 10%, 5%, and 1% significance level, respectively. The value in parentheses is the p-value.*

Source: Own processing

Like the t-test, this regression analysis also confirms that foreign ownership has no significant impact on the number of R&D employees in a given firm. However, it demonstrates that gross expenditures on R&D activities tend to be higher in firms with rising share of foreign ownership. That is in line with results reported by Kim and Lyn (1990), who found that foreign firms spent more on research and development than domestic firms did. Moreover, the negative sign for the *OWNERSHIP*² coefficient suggests that although gross expenditures on R&D activities initially increase with foreign ownership, they then fall as the share of foreign ownership rises further. The turning point for gross expenditures on R&D activities is 62.4 % of foreign ownership in firm. This may be explained by the fact that a foreign investor is initially willing to spend money on R&D activities in the Slovak Republic as its potential contribution to joint venture with local partner. However, with rising share of foreign ownership in connection with majority of voting rights in a joint venture the R&D activities may be transferred to the parent country or other subsidiary.

Willmore (1986), Doms and Jensen (1995) found greater capital intensity in foreign owned firms, which is in accordance with our results. As for net working capital intensity, the results show that foreign firms are more capital intensive than domestic firms. The negative sign for the *OWNERSHIP*² coefficient indicates that if foreign-owned equity shares rise above 64.6 % this may cause the firm's capital intensity to decrease. From the above-described construction of the variable net working capital intensity, it can be deduced that its value decreases with rising number of employees. Hence, the reason for lower capital intensity in firms with higher share of foreign ownership can be that the foreign investors tend to move labour intensive activities to the Slovak Republic as to the country with lower labour costs as comparative advantage.

According to our t-tests, there is a statistically significant difference in firms' performance in production and value added due to foreign ownership. Additionally, the regression analysis suggests that foreignness increases firms' performance, which is in line with findings reported by Willmore (1986), Doms and Jensen (1995), and Arnold and Javorcik (2005). However, considering the negative coefficient found for the squared value of our independent variable, we can argue that performance only increases up to a certain level of foreign ownership, and decreases thereafter. The turning points for production and value added are 62.9 %, and 61.2 % of foreign ownership, respectively. This may explain why wholly foreign-owned firms have lower average values of production and value added than joint ventures, as shown in our descriptive statistics above. These findings confirm the results reported by Akimova and Schwödiauer (2004) for a study on firms in the Ukraine. Similarly as in case of R&D activities, it is usual for foreign firms to transfer the activities with higher value added to the country, where the headquarters is seated, which may be the reason for decreasing values of this variable after reaching the turning point. Regarding the variable production, the foreign investors with majority share in local joint venture may independently decide to divide the production into more host countries, causing decrease in this variable after reaching the turning point.

Although the estimated coefficients for return on sales are statistically significant in both variables - ownership and squared value of ownership, the values of these coefficients are close to zero. Their positive sign suggests that foreignness increases firms' financial performance very slightly. However, this performance measure does not seem to change as the percentage of foreign ownership in a firm rises. This is in line with results reported for Portugal by Barbosa and Louri (2005), and for Bulgaria and Romania by Konings (2000), which also found no evidence that foreign-owned firms performed better. The explanation for this may be that foreign firms usually transfer the profits of their subsidiaries located in the Slovak Republic to other jurisdictions with lower taxation or repatriate the profits. Therefore, they do not maximize the profitability in the host country, since the economic benefits to the shareholders are measured at the level of the whole corporation.

In this research we have confirmed the hypothesis presented by Greenaway, Guariglia, and Yu (2014) that firms achieve optimal performance when they are not wholly foreign, but have some portion of domestic ownership. Based on our calculation of the relevant turning points, the most appropriate level of foreign ownership in a firm seems to oscillate around 61 – 65 %. One possible explanation for these findings may be the fact that both domestic and foreign entrepreneurs bring attributes essential to high performance: domestic entrepreneurs offer knowledge of the domestic market, legal and political environment (in this case, in the Slovak Republic), while foreign investors possess modern technologies, capital, better corporate governance and managerial and international networking skills, as discussed by Caves (2007), Greenaway, Guariglia, and Yu (2014), and Huang, and Shiu (2009).

Conclusion

Several recent studies have been devoted to the comparison of performance between foreign-owned and domestic-owned firms. While some of these studies have shown that

foreign-owned firms outperform their domestic counterparts, other studies have found the opposite. Only a limited number of studies have attempted to examine how the degree of foreign ownership in a firm influences its performance. Our aim was to contribute to the existing literature in this regard. Thus, we conducted analysis in which domestic-owned, foreign-owned and 'joint venture' firms were distinguished, in order to study the influence of mixed ownership on firms' performance. Moreover, our analysis set out to verify the possible non-linearity of the performance-ownership relationship that had been suggested by some authors.

We examined a sample of more than 2,000 firms operating in the industrial sector in Slovakia during the period 2004-2013. The Industry Yearbooks and Yearbooks of Science and Technology published by the Statistical Office of the Slovak Republic were the primary source of the data used. An OLS method was employed to estimate the coefficients in our regression analysis, and a T-test for equality of means was used to test whether there were statistically significant differences between means for the different categories of firms, based on their ownership structure.

The results of the t-tests showed that there is a statistically significant difference in firms' performance due to their ownership in all variables except the number of research and development employees. Our regression analysis confirmed that foreign ownership has no significant impact on a firm's number of R&D employees or leverage.

In terms of gross expenditures on research and development activities, we found that joint ventures spend more on these activities than purely domestic or wholly foreign-owned firms do. Based on our t-tests and regression analysis, we suggest that foreign ownership enhances innovation expenditures up to a certain level of foreign ownership and that after this point, expenditures start to decrease.

The same is valid for net working capital intensity. Firms with foreign ownership are more capital intensive than domestic firms are, and according to our regression analysis, this intensity rises as the foreign investor's presence grows, up to a certain level, before declining.

In terms of production, and value added, the t-tests and regression analysis showed that some domestic ownership is needed for the firms to achieve optimal performance, since joint ventures outperform firms with only domestic or only foreign ownership. In terms of return on sales, an increase in foreign equity shares seems not to cause any change in profitability.

Our results show that foreign ownership and particular performance measures are linked in an inverted U-shaped relationship. A firm's performance increases as its foreign ownership increases, up to the range 61-65 % foreign investment, depending on the measurement of performance, and declines when foreign investment continues to rise beyond this level. These findings challenge Blomström and Sjöholm (1999), and support the suggestions made by Greenaway, Guariglia and Yu (2014), and Akimova and Schwödiauer (2004).

Our paper contributes to a better understanding of the relationship between firms' performance and foreign ownership, especially in Central and Eastern European countries, where there has previously been a clear lack of literature on this issue. In these countries,

the effect of FDI inflows on firms' performance may be an important channel for the "catching-up" process. In this paper, we have shown that attracting FDI via joint ventures could be especially beneficial for firms. Thus, these findings may be of use in the optimization of investment promotion policy.

As our analysis focused on all industrial firms operating in Slovakia, and did not distinguish between particular industrial sectors, we believe that it would be advisable to continue to investigate these research questions by testing for possible intersectoral differences in the ownership - performance relationship. In addition, for a more comprehensive understanding of the relationship between firms' performance and foreign ownership, further research covering other Central and Eastern European countries would be desirable.

Funding: This paper presents partial results of the research project „Quantitative analysis of performance differences of domestic and foreign industrial enterprises” supported by University of Economics in Bratislava.

Disclosure statement: “No potential conflict of interest was reported by the authors.”

References

- AITKEN, B. & HARRISON, A. (1999) Do domestic firms benefit from direct foreign investment? Evidence from Venezuela. *The American Economic Review*. 89 (3), pp. 605-617. DOI: [10.1257/aer.89.3.605](https://doi.org/10.1257/aer.89.3.605)
- AKIMOVA, I. & SCHWÖDIAUER, G. (2004) Ownership structure, corporate governance and enterprise performance: empirical results from Ukraine. *International Advances in Economic Research*. 10 (1), pp. 28-42.
- AMOLD, J. M. & JAVORCIK, B.S. (2005) Gifted kids or pushy parents? Foreign acquisitions and plant performance in Indonesia. *Development Studies Working Paper*. 197.
- AYDIN, N., SAYIM, M. & YALAMA, A. (2007) Foreign ownership and firm performance: evidence from Turkey. *International Research Journal of Finance and Economics*. 11, pp. 103-110.
- AZZAM, I., FOUAD, J. & GHOSH, D. K. (2013) Foreign ownership and financial performance: evidence from Egypt. *International Journal of Business*. 18 (3), pp. 232-254.
- BARBOSA, N. & LOURI, H. (2005) Corporate performance: does ownership matter? Comparison of foreign and domestic owned firms in Greece and Portugal. *Review of Industrial Organization*. 27 (1), pp. 73-102. DOI: [10.1007/s11151-005-4920-y](https://doi.org/10.1007/s11151-005-4920-y)
- BIJSTERBOSCH, M. & KOLASA, M. (2010) FDI and productivity convergence in Central and Eastern Europe: an industry-level investigation. *Review of World Economics/Weltwirtschaftliches Archiv*. 145 (4), pp. 689-712. DOI: [10.1007/s10290-009-0036-z](https://doi.org/10.1007/s10290-009-0036-z)

- BLOMSTRÖM, M. (1988) Labor productivity differences between foreign and domestic firms in Mexico. *World Development*. 16 (11), pp. 1295-1298. DOI: [10.1016/0305-750X\(88\)90205-7](https://doi.org/10.1016/0305-750X(88)90205-7)
- BLOMSTRÖM, M. & SJÖHOLM, F. (1998) Technology transfers and spillovers: does local participation with multinationals matter? *European Economic Review*. 43 (4-6), pp. 915-923.
- BOARDMAN, A. E., SHAPIRO, D.M. & VINING, A. R. (1997) The role of agency costs in explaining the superior performance of foreign MNE subsidiaries. *International Business Review*. 6 (3), pp. 295-317. DOI: [10.1016/S0969-5931\(97\)00005-X](https://doi.org/10.1016/S0969-5931(97)00005-X)
- BROWN, J. D., EARLE, J. S. & TELEGDY, Á. (2006) The productivity effects of privatization: longitudinal estimates from Hungary, Romania, Russia, and Ukraine. *Journal of Political Economy*. 114 (1), pp. 61-99. DOI: [10.1086/499547](https://doi.org/10.1086/499547)
- CAVES, R. E. (2007) *Multinational enterprise and economic analysis*. 3th edn. Cambridge: Cambridge University Press.
- CHHIBBER, P. K. & MAJUMDAR, S. K. (1999) Foreign ownership and profitability: property rights, control, and the performance of firms in Indian industry. *Journal of Law and Economics*. 42 (1), pp. 209 - 238. DOI: [10.1086/467423](https://doi.org/10.1086/467423)
- DIMELIS, S. & LOURI, H. (2002) Foreign ownership and production efficiency: a quantile regression analysis. *Oxford Economic Papers*. 54, pp. 449-469. DOI: [10.1093/oep/54.3.449](https://doi.org/10.1093/oep/54.3.449)
- DOMS, M. & JENSEN, J.B. (1995) Comparing wages, skills, and productivity between domestically and foreign-owned manufacturing establishments in the United States. In: Baldwin, R. E. & Lipsey, R. E. & J Richardson, J. D. (eds.). *Geography and Ownership as Bases for Economic Accounting*. Chicago: University of Chicago Press.
- DRAHOKOUPIL, J. (2008) The investment-promotion machines: the politics of foreign direct investment promotion in Central and Eastern Europe. *Europe-Asia Studies*. 60 (2), pp. 197-225. DOI: [10.1080/09668130701820085](https://doi.org/10.1080/09668130701820085)
- GELÜBCKE, J. P. W. (2013) The performance of foreign affiliates in German manufacturing: Evidence from a new database. *Review of World Economics*. 149 (1), pp. 151-182. DOI: [10.1007/s10290-012-0142-1](https://doi.org/10.1007/s10290-012-0142-1)
- GOETHALS, J. & OOGHE, H. (1997) The performance of foreign and national takeovers in Belgium. *European Business Review*. 97 (1), pp. 24-37. DOI: [10.1108/09555349710156037](https://doi.org/10.1108/09555349710156037)
- GRABOWSKI, H. G. & MUELLER, D. C. (1978) Industrial research and development, intangible capital stocks, and firm profit rates. *The Bell Journal of Economics*. 9 (2), pp. 328-343. DOI: [10.2307/3003585](https://doi.org/10.2307/3003585)
- GREENAWAY, D., GUARIGLIA, A. & YU, Z. (2014) The more the better? Foreign ownership and corporate performance in China. *European Journal of Finance*. 20 (7-9), pp. 681-702. DOI: [10.1080/1351847X.2012.671785](https://doi.org/10.1080/1351847X.2012.671785)

- HALKOS, G. E. & TZEREMES, N. G. (2010) The effect of foreign ownership on SMEs performance: an efficiency analysis perspective. *Journal of Production Analysis*. 34, pp. 167-180. DOI: [10.1007/s11123-010-0174-2](https://doi.org/10.1007/s11123-010-0174-2)
- HOWENSTINE, N. G. & ZEILE, W. J. (1994) Characteristics of foreign-owned U.S. manufacturing establishments. *Survey of Current Business*. 74 (1), pp. 34-59.
- HUANG, R. D. & SHIU, C. Y. (2009) Local effects of foreign ownership in an emerging financial market: Evidence from qualified foreign institutional investors in Taiwan. *Financial Management*. 38 (3), pp. 567-602. DOI: [10.1111/j.1755-053X.2009.01048.x](https://doi.org/10.1111/j.1755-053X.2009.01048.x)
- JARQUE, C. M. & BERA, A. K. (1980) Efficient tests for normality, homoscedasticity and serial independence of regression residuals. *Economics Letters*. 6 (3), pp. 255-259. DOI: [10.1016/0165-1765\(80\)90024-5](https://doi.org/10.1016/0165-1765(80)90024-5)
- JAVORCIK, B. S. (2004) Does foreign direct investment increase the productivity of domestic firms? In search of spillovers through backward linkage. *The American Economic Review*. 94 (3), pp. 605-627. DOI: [10.1257/0002828041464605](https://doi.org/10.1257/0002828041464605)
- KONINGS, J. (2000) The effects of foreign direct investment on domestic firm. *Economics of Transition*. 9 (3), pp. 619-633. DOI: [10.1111/1468-0351.00091](https://doi.org/10.1111/1468-0351.00091)
- KIM, W. S. & LYN, E. O. (1990) FDI theories and the performance of foreign multinationals operating in the U.S. *Journal of International Business Studies*. 21 (1), pp. 41-54. DOI: [10.1057/palgrave.jibs.8490326](https://doi.org/10.1057/palgrave.jibs.8490326)
- LECRAW, D. J. (1984) Bargaining power, ownership, and profitability of transnational corporations in developing countries. *Journal of International Business Studies*. 15 (1), pp. 27-43. DOI: [10.1057/palgrave.jibs.8490469](https://doi.org/10.1057/palgrave.jibs.8490469)
- LIU, X., PARKER, D., VAIYDA, K. & WEI, Y. (2000) The impact of foreign direct investment on labour productivity in the Chinese electronic industry. *Working Paper no. 2000/002*. United Kingdom: Lancaster University Management School.
- MOSER, B. K. & STEVENS, G. R. (1992) Homogeneity of variance in the two-sample means test. *The American Statistician*. 46 (1), pp. 19-21.
- NAKANO, M. & NGUYEN, P. (2013) Foreign ownership and firm performance: evidence from Japan's electronics industry. *Applied Financial Economics*. 23, pp. 41-50. DOI: [10.1080/09603107.2012.705425](https://doi.org/10.1080/09603107.2012.705425)
- ROSS, S.A., CHAMBERS, S. & JOHNSTON, R. (2002) *Corporate Finance*. 6th edn. New York: Mcgraw-Hill College.
- STUDENT (1908) The Probable Error Of a Mean. *Biometrika*. 6 (1), pp. 1-25. DOI: [10.1093/biomet/6.1.1](https://doi.org/10.1093/biomet/6.1.1)
- SUCHÁNEK, P., RICHTER, J. & KRÁLOVÁ, M. (2014) Customer satisfaction, product quality and performance of companies. *Review of Economic Perspectives*. 14 (4), pp. 329-344. DOI: [10.1515/revecp-2015-0003](https://doi.org/10.1515/revecp-2015-0003)

- SUCHÁNEK, P. & ŠPALEK, J. (2012) Quality and performance of the company in the Czech Republic. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*. 60 (4), pp. 351-362. DOI: [10.11118/actaun201260040351](https://doi.org/10.11118/actaun201260040351)
- ŠESTÁKOVÁ, M. (2008) *Konkurencia medzi štátmi v oblasti získavania a udržania zahraničných investícií*. Bratislava: Ekonomický ústav SAV.
- TANGEN, S. (2003) An overview of frequently used performance measures. *Work Study*. 52 (7), pp. 347-354. DOI: [10.1108/00438020310502651](https://doi.org/10.1108/00438020310502651)
- WELCH, B. L. (1947) The generalization of "Student's" problem when several different population variances are involved. *Biometrika*. 34 (1-2), pp. 28-35.
- WILLMORE, L. (1986) The comparative performance of foreign and domestic firms in Brazil. *World Development*. 14 (4), pp. 489-502. DOI: [10.1016/0305-750X\(86\)90065-3](https://doi.org/10.1016/0305-750X(86)90065-3)
- YASAR, M. & PAUL, C. J. M. (2009) Size and foreign ownership effects on productivity and efficiency: an analysis of Turkish motor vehicle and parts plants. *Review of Development Economics*. 13 (4), pp. 576–591. DOI: [10.1111/j.1467-9361.2009.00527.x](https://doi.org/10.1111/j.1467-9361.2009.00527.x)
- ZEMPLINEROVÁ, A. (2010) Innovation activity of firms and competition. *Politická ekonomie*. 58 (6), pp. 747-760.
- ZEMPLINEROVÁ, A. & HROMÁDKOVÁ, E. (2012) Determinants of firm's innovation. *Prague Economic Papers*. 21 (4), pp. 487-503. DOI: [10.18267/j.pep.436](https://doi.org/10.18267/j.pep.436)

