

IMPACT OF FOREIGN DIRECT INVESTMENT ON ECONOMIC GROWTH IN THE ZILINA REGION

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Abstract:

Research background: Foreign direct investment (FDI) is usually considered as a factor that can positively influence the economy growth, but not just directly through accumulation of the capital, job opportunities, and increase of export, but also through technological improvement.

Purpose of the article: Many studies have focused on the verification of the relationship of FDI and economic growth, therefore, this article is also aimed at the verification of the impact of FDI on the economic growth of a selected region of the Slovak Republic – Zilina Region – measured by the value of the gross domestic product (GDP) created in this region, labour productivity and unemployment.

Methods: The analysis uses data gathered from the Statistical Office of the Slovak Republic and the National Bank of Slovakia through the years 2008-2019. The verification of the impact of FDI on economic growth is provided by correlation and regression analysis using the independent variable represented by foreign direct investment that came into the Zilina Region and the dependent variable represented by the value of the gross domestic product (expressing economic growth) of the Zilina region, the labour productivity per employed person (reflecting the efficiency of selected resource consumption) and the unemployment rate.

Findings & Value Added: The results of the analysis confirm that FDI have a strong influence on economic growth as well as other indicators in this region; therefore, it is necessary to prepare policies that can enhance the arrival of other foreign investors into this region.

Keywords: foreign direct investment; economic growth; region; Zilina Region; Slovak Republic

JEL Classification: E22; F21; F63; R11

1. Introduction

It is generally accepted that foreign direct investments (FDI) represent an important driver of economic development in emerging as well as developed countries (Nguyen et al., 2019; Vo et al., 2019). They are beneficial not only to the host companies that receive foreign capital as an external source of funding, but also to other businesses, entire regions, and the national economy. Significant positive effects of FDI may appear, especially when foreign investors reinvest the profit gained in further development in the host country. FDIs are most closely associated with economic growth expressed by the growth of gross domestic product (GDP).

OECD (2023) defines FDI as cross-border investment carried out by an investor resident in one economy establishing a lasting interest in and a significant degree of influence over an enterprise resident in another economy. Evidence of such a relationship is ownership of at least 10% of the voting power in an enterprise abroad. FDI is essential for international economic integration because it enhances stable and long-lasting links between economies and promotes international trade through access to foreign markets.

The way in which FDI impacts host countries has long been discussed. FDI represents an important channel for transferring tangible assets as well as intangible assets such as technology, innovative product design, marketing proficiency, managerial skills, or knowledge (Simionescu, 2016; Boghean and State, 2015; Osei and Kim, 2020; Sufyan et al., 2023). The literature on this topic frequently looks at the effects of FDI in driving economic development in host countries. Chen and Zhou (2023) state that in addition to direct economic impacts on the productivity of businesses receiving foreign investment, foreign investors influence host countries' economic activities also indirectly, which is mainly reflected in productivity increases in domestic (local) businesses and establishment of new businesses. Spillover effects inextricably linked to FDI take many different forms. Ben Hamida and Piscitello (2013) distinguish particularly spillover effects related to more efficient use of existing technology and resources or an assimilation of foreign technologies, as well as resulting from introduction of new know-how to local businesses (e.g., demonstrating new technologies and training employees who later work for local businesses). Typical channels of horizontal and vertical spillovers are imitation (copying new technologies), labour mobility (hiring trained workers and managers from foreign-owned companies), competition, backward and forward links with domestic businesses (technology transfers to domestic suppliers or customers in the production chain), exposure to international trade or R&D activities (Ben Hamida and Piscitello, 2013; Hanousek et al., 2011).

The positive effect on economic growth is ensured by spillover effects and productivity improvement (including labour productivity), although empirical studies on the relationship between FDI and economic growth showed ambiguous results. Few studies found little or no evidence that FDI contributes to economic growth. On the contrary, economic growth attracts more FDI inflows, i.e., rapid GDP growth creates new investment opportunities in the host country. The correlation between FDI inflows into host countries and their economic development is influenced by many determinants, such as human capital, knowledge, trade openness, host country policies and environment, macroeconomic stability, level of economic and financial sector development, spillovers of technology and knowledge, innovation transfer, and others (Osei and Kim, 2020; Sokhanvar, 2019; Simionescu, 2016; Abbes et al., 2015; Encinas-Ferrer and Villegas-Zermeno, 2015; Pegkas, 2015). Similarly, Darmo et al. (2020) claim that FDI inflow is determined by several factors; among the most significant are the level of economic performance, most often expressed through GDP per capita and the level of unemployment. However, it is not evident whether the positive development of economic performance affects FDI inflows, or vice versa, inflows of FDI affect the level of economic

performance. This means that these macroeconomic indicators are variables that mutually influence them. The results in the Slovak Republic in the period of 1995-2018 revealed that the change in GDP and unemployment rate had an impact on the change in FDI inflows, and thus the causality goes from the GDP and unemployment rate to FDI inflows. Their development may influence investors' decision making on the allocation of investment in the Slovak Republic because stability of the economy is perceived positively by foreign investors, who consider the country as a potential location for foreign investments.

In contrast to the positive relationship mentioned above between FDI and economic growth for cross-country data, a negative relationship was found. Jun-Yi and Chih-Chiang (2008) identified no relationship between FDI and economic growth for 62 countries over the 1975-2000 period. Similarly, Lyrouti et al. (2004) found no impact of FDI on economic growth in emerging markets during 1995–1998.

The interdependencies between the FDI and the labour market-related aspects are an important topic in the literature concerned with the study of the FDI. Most studies report that foreign direct investments decrease the unemployment rate (Bakkalci and Argin, 2013; Karlsson et al., 2009; Ajaga and Nunnekamp, 2009, etc.), the obtained results have not yet fully clarified the linkages between these two phenomena. However, the interdependencies between foreign direct investment and the unemployment rate vary significantly from country to country. They depend on the structure of the economy, the type of foreign direct investment received, as well as on the time period, which is investigated (the structure of an economy can change significantly over a long period of time, and also the typology of the received foreign direct investment can change significantly over longer periods of time) (Strat et al., 2015). In contrast, there are a significant number of studies that report no causal relation among these two phenomena (Aktar and Ozturk, 2009; Rizvi and Nishat, 2009).

2. Methodology

The main aim of the article is to investigate the relationship between foreign direct investment invested in the Zilina Region and the value of the gross domestic product created in this region, labour productivity, and the unemployment rate. As we wanted to work with more relevant data, we have decided to analyse a longer period – years 2008-2019. For this analysis, secondary data were used from two main sources – the Statistical Office of the Slovak Republic and the National Bank of Slovakia. The first institution provides information on the gross domestic product created in the Slovak Republic and particular regions, including the Zilina region as well as data on labour productivity and the unemployment rate. The National Bank of Slovakia focuses (among other areas) on the analysis of foreign direct investment – coming to Slovakia and flowing from Slovakia abroad, at the regional level. Data considering the situation in the Zilina region were analysed. As Bewick et al. (2003) explain, the most used techniques for investigating the relationship between two quantitative variables are correlation and linear regression. Correlation quantifies the strength of the linear relationship between a pair of variables, whereas regression expresses the relationship in the form of an equation. As the aim of this paper is to empirically analyse the impact of foreign direct investment (FDI) on the economic development of the Zilina region, the analysis will be conducted using correlation and regression analysis techniques to examine the relationship between the level of FDI (as an independent variable) and several dependent variables (i.e., GDP, labour productivity, and unemployment rate) within the region. Correlation analysis will be used to determine whether there is a relationship between the variables, while regression analysis will help investigate cause-and-effect relationships. The Pearson correlation coefficient will be calculated to

measure the dependence between the FDI level (X) as the independent variable and the GDP level, labour productivity and unemployment rate (Y) as the dependent variables. In general, the correlation coefficient is given by the following equation:

$$r = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}}, \quad (1)$$

where \bar{x} is the mean of the x values,

\bar{y} is the mean of the y values.

The value of r always lies between -1 and +1. A value of the correlation coefficient close to +1 indicates a strong positive linear relationship (i.e., one variable increases with the other), and a value close to -1 indicates a strong negative linear relationship (i.e., one variable decreases as the other increases). A value close to 0 indicates that there is no linear relationship; however, there could be a non-linear relationship between the variables (Obilor and Amadi, 2018). Additionally, the regression coefficient will indicate the degree of change in the dependent variables for a one-unit change in the independent variable.

3. Results

The Zilina region is located in the northwestern part of the Slovak Republic and serves as a significant international crossroad that connects the transport networks of Slovakia, the Czech Republic and Poland. The capital city of Zilina acts as the main transportation hub, offering easy access to the surrounding towns and districts. With an area of 6,809 square kilometres, the Zilina region ranks as the third largest region in Slovakia, covering 13.9% of the country's territory. This region can be classified as an industrial region with significant potential for development, making it highly attractive to foreign investors. Its advantageous location near industrial zones in neighbouring countries such as the Czech Republic and Poland contributes to its appeal. The region holds importance as an economic hub offering abundant employment opportunities. In 2021, 51.3% of the economically active population resided in the region, with an economic activity rate of 61.3%. The employment rate was 76.3%, while the unemployment rate reached 4.9%. The average nominal monthly wage amounted to 1,308 euros, which was 6.9% lower than the national average (Statistical Office of the Slovak Republic, 2021).

In 2019, the industrial sector employed 31.20% of the region's workforce, representing the highest share among all economic activities. Compared to other regions, the construction sector has a strong position in the Zilina region, contributing 13% of annual turnover and employing 5.90% of the workforce in the construction industry. Significant employment opportunities are also found in the wholesale and retail trade sector, which represents 14.20% of the region's workforce, and the transportation and storage sector, employing 5.70% of the workforce.

The next table presents an overview of the value of foreign direct investment invested in Zilina region during the period 2008-2019, which includes equity participation, reinvested earnings, and other capital together with information about its changes over time in absolute and relative measures (Table 1).

Based on the data presented in the Tab. 1, it can be confirmed that the FDI flowing into the Zilina region experienced a significant increase of 125% in 2019 compared to 2008. Although there was a slight decrease in FDI during a two-year period, it was not substantial. In particular, in the last three years of the analysed period, there was a relatively substantial increase in FDI in the Zilina region. This confirms that Zilina region stands out for its high attractiveness to

Table 1: Foreign direct investment in Zilina region in 2008-2019

Year	2008	2009	2010	2011	2012	2013
FDI value (thousand €)	2,195,419	2,078,715	2,283,702	2,701,659	2,687,683	2,721,812
Absolute changes in FDI	-	- 116,704	204,987	417,957	- 13,976	34,129
FDI growth / decline (%)	-	- 5.32	9.86	18.30	- 0.52	1.27
Year	2014	2015	2016	2017	2018	2019
FDI value (thousand €)	2,722,713	3,051,147	3,082,535	3,517,650	3,999,453	4,956,302
Absolute changes in FDI	901	328,434	31,388	435,115	481,803	956,849
FDI growth / decline (%)	0.03	12.06	1.03	14.12	13.70	23.92

Source: National Bank of Slovakia

foreign investors. Its advantageous geographical location, close to industrial centres in the Czech Republic and Poland, along with a strong manufacturing base, competitive wages, and previous significant investments in the automotive industry, continues to attract new foreign direct investments. In addition, these investments exceed the national average and are focused on research and development.

Gross domestic product (GDP) serves as an indicator of a nation's economic health and its growth. It quantifies the monetary value of all goods and services produced within a country during a specific time frame. The next table provides the GDP levels in the Zilina region from 2008 to 2019 together with absolute and relative changes over the analysed period (Table 2).

Table 2: Gross domestic product in Zilina region in 2008-2019

Year	2008	2009	2010	2011	2012	2013
GDP (thousand €)	7,632,116	7,107,850	7,838,425	7,923,107	8,159,010	8,130,848
Absolute changes in GDP	-	- 524,266	730,575	84,682	235,903	- 28,162
GDP growth / decline (%)	-	- 6.87	10.28	1.08	2.98	- 0.35
Year	2014	2015	2016	2017	2018	2019
GDP (thousand €)	8,498,880	8,977,874	8,979,529	9,238,639	9,812,267	10,701,495
Absolute changes in GDP	368,032	478,994	1,655	259,110	573,628	889,228
GDP growth / decline (%)	4.53	5.64	0.02	2.89	6.21	9.06

Source: Statistical Office of the Slovak Republic

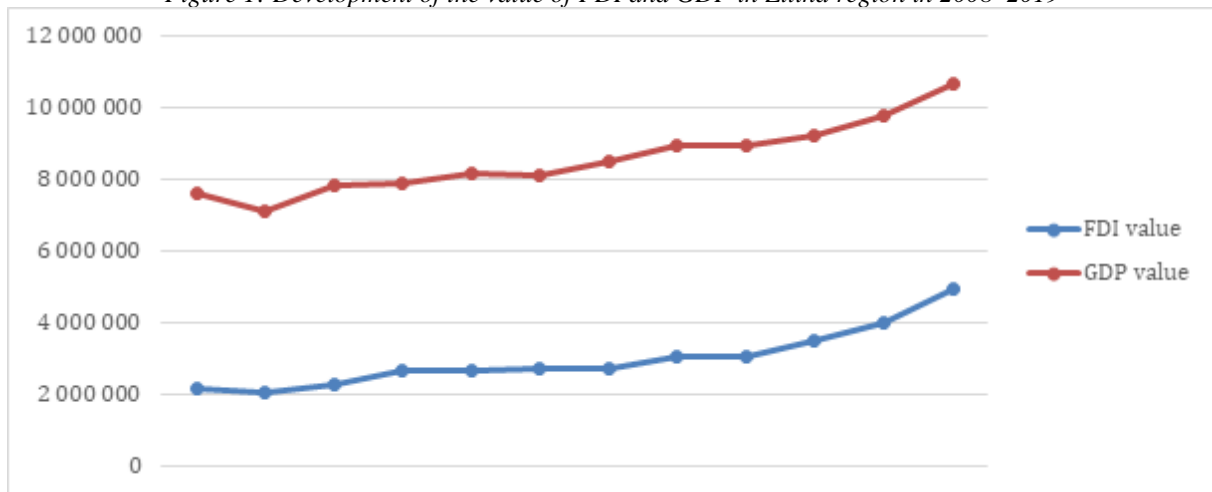
Based on the data from Tab. 2, we can confirm that the situation in the Zilina region developed relatively positively during the observed period. There were only two years when GDP experienced a decline, namely in 2009 and 2013. By 2019, the generated GDP had already reached 140% of the GDP value from 2008. Throughout the observed period, there was alternating growth, with either a slight increase (0.02% in 2010 compared to the previous year) or a significant increase (10.28% in 2010 compared to the previous year) being recorded. The next figure presents the development of the value of foreign direct investment and gross domestic product in Zilina region during the years 2008-2019 (Figure 1).

Both curves in Figure 1 consistently show an upward trend throughout the period, indicating a direct correlation between the two variables. The figure demonstrates that as foreign direct investments increase, so does the value of created GDP, providing confirmation of the theoretical research regarding the impact of FDI on economic growth.

However, it is important to emphasize that statistical analysis is necessary to provide more specific information about this relationship. The next table contains values of the Pearson correlation coefficient and regression coefficient (Table 3).

According to the Pearson correlation coefficient in the Table 3, there is a significant and positive linear relationship between the level of FDI (PZI) and the level of GDP. This is evident from the high correlation coefficient value of 0.9741. The Pearson correlation coefficient value indicates that as the FDI level increases, the GDP also increases. Furthermore, the regression coefficient, b_1 , shows that a 1,000 euro increase in FDI annually results in an average GDP volume increase of 1,194.23 euros.

Figure 1: Development of the value of FDI and GDP in Zilina region in 2008–2019



Source: National Bank of Slovakia, Statistical Office of the Slovak Republic

Table 3: Calculation of Person correlation coefficient and regression coefficient

Variables	Indicator	Measurement unit	Pearson correlation coefficient	Regression coefficient b_1
X – independent	value of foreign direct investment	thousand €	0.9741	1.19423
Y – dependent	value of gross domestic product	thousand €		

Source: authors' calculations in SPSS

Based on a review of the literature, we selected the indicator of labour productivity to be analysed in relation to the development of FDI in the Zilina region. The indicator of labour productivity expresses the effectiveness of the consumption of business production factors measured by the value of the outputs produced. It increases as a result of advanced technologies, higher workforce skills, and capital deepening, including the inflow of FDI that improves capital equipment. Table 4 presents the yearly labour productivity per employed person in the Zilina region.

Table 4: Nominal labour productivity per employed person in the Zilina region

Year	2008	2009	2010	2011	2012	2013
Labour productivity (€)	22,724	21,754	24,156	24,165	24,665	24,571
Year	2014	2015	2016	2017	2018	2019
Labour productivity (€)	25,087	25,607	25,093	25,093	25,788	27,218

Source: Statistical Office of the Slovak Republic

The Zilina region experienced its highest labour productivity during the observed period in 2019, reaching 27,218 euros per employed person, which coincided with the highest level of FDI. On the contrary, the lowest labour productivity was observed in 2009, aligning with the lowest level of FDI in the Zilina region.

The following Table 5 presents the results of the correlation and regression analysis between the value of FDI and the productivity of labour per employed person.

The Pearson correlation coefficient in Table 5 reveals a strong positive linear relationship between the level of FDI (PZI) and the labour productivity per employee, with a coefficient value of 0.8665. This correlation coefficient indicates that as the level of FDI increases, labour productivity also tends to increase. Furthermore, the regression coefficient, b_1 , shows that for every 1,000,000 euros increase in the FDI level on an annual basis, labour productivity per employed person, on average, increases by 1.49 euros.

Table 5: Correlation and regression analysis of the impact of FDI on labour productivity

Variables	Indicator	Measurement unit	Pearson correlation coefficient	Regression coefficient b_1
X – independent	value of foreign direct investment	thousand €	0.8665	0.00149
Y - dependent	value of labour productivity	€		

Source: authors' calculations in SPSS

The last indicator that we included in our research was the registered unemployment rate in the Zilina region. The following table illustrates the evolution of the registered unemployment rate in the Zilina region from 2008 to 2019.

Table 6: Registered unemployment rate in the Zilina region

Year	2008	2009	2010	2011	2012	2013
Registered unemployment rate (%)	6.20	10.89	10.86	11.91	12.79	12.51
Year	2014	2015	2016	2017	2018	2019
Registered unemployment rate (%)	10.91	8.86	6.92	4.70	4.04	3.96

Source: Statistical Office of the Slovak Republic

The data in Table 6 reveals an inverse relationship between the level of FDI and unemployment, indicating that as the level of FDI increases, the registered unemployment rate decreases. In recent years, when the FDI level reached its highest point, the region experienced the lowest registered unemployment rate. Specifically, 2019 recorded the lowest registered unemployment rate, coinciding with the highest FDI level in the Zilina region.

Table 7: Correlation and regression analysis of the impact of FDI on the unemployment rate

Variables	Indicator	Measurement unit	Pearson correlation coefficient	Regression coefficient b_1
X – independent	value of foreign direct investment	thousand €	- 0.7062	- 0.0000029
Y - dependent	value of unemployment rate	%		

Source: authors' calculations in SPSS

The correlation coefficient in the Table 7 reveals a robust negative linear relationship between the level of FDI (PZI) and the registered unemployment rate, with a coefficient value of -0.7062. This indicates that as the annual level of FDI increases, the registered unemployment rate proportionally decreases. The regression coefficient, b_1 , has a value of -0.0000029, signifying that a 1,000,000 euro increase in the FDI level corresponds to an average decrease of 0.0029% in the registered unemployment rate.

Through our previous empirical analysis of the correlation and regression of FDI in selected regional indicators, we have established the significant importance of FDI for the regional development of the Zilina region.

4. Discussion

The Zilina region plays a significant role in the economy of Slovakia, this can be confirmed through the values of many economic indicators. In 2021, the Zilina Region accounted for more than 11% of the total GDP of the Slovak Republic, making it the third largest share among the eight regions. Regarding the total number of jobs created (based on available data for 2020) in Slovakia (2,419,902), more than 13% were generated in the Zilina region, placing it as the second-highest region in terms of job creation, following the Bratislava region. In terms of research and development expenditures, the Zilina Region holds a significant position. In 2021,

the region allocated more than €78 million to research and development, ensuring that the Zilina region occupied the fourth position among other regions (based on available data for 2021). Several foreign investors have expressed interest in this region, as indicated by the structure of foreign direct investment in 2019. Almost 10% of the total volume of foreign direct investment flowing into Slovakia was directed to the Zilina region, representing the second highest share among all regions in the Slovak Republic.

Investigating the relationship between foreign direct investment and economic growth has been the objective of various domestic and international studies. Some studies have focused on regional aspects and specific regions (Fabus, 2014), while others have examined the overall countries (Quoc and Thi, 2018; Carbonell and Werner, 2018; Hlavacek and Bal-Domanska, 2016). The results of these studies differ; some have confirmed a strong correlation and impact of foreign direct investment on subsequent economic growth, while others argue that such a connection does not exist. As our focus is on regional analysis of selected regions in the Slovak Republic, the study by Fabus (2014) becomes particularly relevant for comparison. This author examined four specific regions in Slovakia: Bratislava region, Zilina region, Banská Bystrica region and region, in all of them, a strong relationship between FDI and economic growth was confirmed, that is, FDI is significant to GDP growth in these regions. As we demonstrate the positive correlation between FDI and GDP level in the Zilina region, our results are in line with studies by Hlavacek and Bal-Domanska (2016) as well as Bayer and Marius (2018) who examined the positive impact of FDI on GDP growth in countries in Central and Eastern Europe.

Similarly, to the trends of previous indicators (GDP and labour productivity), the development of the unemployment rate in the Zilina region confirmed the beneficial impact of FDI. Pearson's correlation coefficient recorded a strongly negative correlation in relation to FDI, and thus confirmed the indirect dependence of unemployment in the region on the growth of FDI. Similar results were recorded by Balcerzak and Zurek (2011) recorded similar results, who carried out research on the relationship between FDI and the labour market in Poland, using a quarterly data period 1995-2009. They found a long-term link between increased FDI and decreased unemployment in Poland.

5. Conclusions

This article aimed to analyse the relationship between foreign direct investment and the economic growth of Zilina region. Foreign direct investments are associated with a multitude of impacts and changes in the regional economy and the development of the host country. According to many studies, they have a long-term positive influence on the development of the host country and contribute to raising the living standards of its population. One of the main positive effects of foreign direct investment is the increase of labour productivity and contribution to the creation of the host country's national income (Boghean and State, 2015). Drabek and Merkova (2010) also describe the effects in employment growth, increase of exports, improvement of the institutional environment, investments in education, and enhanced access to foreign capital.

The effects of FDI can be analysed not only through the GDP or labour productivity generated in particular region; therefore, this study could be expanded by additional analysis of other economic and noneconomic indicators and potential influence of foreign direct investment on them. Moreover, there is also the possibility of analysing the opposite effect through potential influence of economic growth on the inflow of FDI.

The authors see several limitations of this study. First, as the analysed period in the article was twelve years, it may cause some distortions on macroeconomic indicators. Second, the presence of a global economic crisis from 2008 may lead to economic and political instability in the analysed region. This potential problem has not been considered in the study.

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Data Availability Statement: Publicly available datasets were analysed in this study. These data can be found here:

https://datacube.statistics.sk/#!/lang/sk/?utm_source=susr_portalHP&utm_medium=page_database&utm_campaign=DATAcube_portalHP

<https://nbs.sk/statisticke-udaje/statistika-platobnej-bilancie/priame-zahranicne-investicie/>

Conflicts of Interest: The authors declare that they have no conflict of interest.

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