



Macro-Environment Factors Determining SME Development in the Slovak Republic

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Abstract: *Business in the segment of small and medium enterprises has its specifics. Due to their size, these companies have several advantages over large companies, but also several disadvantages. An important factor for the development of the economy is the performance and success of small and medium-sized enterprises, which depend not only on their ability to effectively use production factors or internal resources but also on the structure and quality of the business environment. The presented paper aims to describe the development of the macroeconomic environment in the Slovak Republic and its impact on the development of SMEs through the analysis of selected specific national economic indicators, as well as to outline other possible directions. By analysing selected macro indicators, we want to capture the development trends of the environment in which SMEs carry out their business activities, and which can significantly affect them.*

1. INTRODUCTION

The impact of the environment on the company can be positive, but also negative. It is up to the decision and ability of the company how to analyze all the influences, know the direction of their operation and apply them to the current environment in which it finds itself. An important part is to realize that the impact of the environment is different for each company. What is a problem for one company can bring opportunities for development to another (Vodák et al., 2016). As the environment of the company, we understand the part of the environment and the elements that affect it and with which it is in direct contact. We can further divide the environment of the company into macro-environment and micro-environment. An environment that affects the ability to effectively meet the needs of the target market is called a microenvironment. It includes suppliers, intermediaries, distribution channels, consumer markets, competition, the public, and, of course, the company itself. We divide the macroenvironment into six parts, namely: demographic, economic, political, cultural, natural and technological environment (Matúš, Ďurková, 2012).

The term macro-environment most often refers to the external environment of the company, which brings it various opportunities, but also risks. If a company wants to reduce risks as much as possible and, conversely, take advantage of all opportunities, it needs to know the best possible external environment, which is constantly changing. However, it cannot influence this environment in almost any way, it only has to adapt sufficiently to it (Kotler, 2007). The macroenvironment can be characterized as the “envelope” of the microenvironment, which is based on factors that the company can not influence. This macro environment is the same for companies, but it affects each company

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differently. The reason for these different influences is that each company is different and otherwise sensitive to the surrounding stimuli (Grasse, et al., 2010). The socio-demographic environment belongs to the most important parts of the macro-environment for companies. Demography deals with the people who make up the markets themselves. It should be borne in mind that rural residents have a different interest in products than urban residents. Interest also changes with age, gender, or even education. A very important factor is also the demographic changes of the population from large cities to rural settlements, or the transfer of students from one part of the country to another. Human needs are the main reason for the existence of businesses. In other words, people are the driving force behind the market development. Large and diverse demographics offer opportunities as well as challenges. Especially in times of rapid world population growth and overall demographic change, traders must monitor demographic developments, human needs and interests. The reason is that changing demographics means changing the market, and changing markets means the need for adjusted business strategies (Claessens, 2015). The economic environment consists of factors that affect consumers in terms of their spending structure, shopping habits, but also purchasing power. Purchasing power is determined mainly by consumer incomes, the ability to save and at the same time the possibility of drawing loans. Companies need to monitor the development of income in individual regions. The basic factors that we can observe in terms of the macroeconomic environment are (Vodák et al., 2016): regional gross domestic product, economically active population, inflation, nominal wages and unemployment. Regional gross domestic product (regional GDP) is the most frequently used aggregate to measure production in the region. This is the total final production of goods and services produced in a given region for the observed period by production factors located in this region. The economically active population of the region includes all persons, regardless of gender, who make up the labor supply for the production of goods and services. Inflation is a manifestation of the general imbalance of the economy, which is characterized by a permanent rise in the price level. (Klíková et al., 2019) The amount of nominal wage is the result of the relationship between demand and supply of labor, it is the price of labor. Unemployment is “a socio-economic phenomenon where the supply of labor is less than the demand for it.” (Jánošová, 2012)

The object of our research are micro, small and medium-sized businesses. For a clear specification and identification of the subject of the research, we relied on the guidelines of the European Commission (EC), which defines an enterprise as an entity that performs an economic activity, regardless of its legal form. The determining factor is the economic activity, not the legal form. Therefore, self-employed persons and family businesses engaged in craft or other activities, companies, partnerships, or associations regularly engaged in economic activity may also be included among enterprises. Following the European Commission’s Recommendation, 2003/361/EC on the definition of SMEs, small and medium-sized enterprises include enterprises with less than 250 employees, an annual turnover not exceeding EUR 50 million and a total annual balance sheet not exceeding EUR 43 million. The individual size categories of SMEs are determined according to the limit values of the above criteria, while we distinguish three categories: micro-enterprise, small business and medium business.

From the point of view of the territorial-administrative organization, the Slovak Republic currently consists of eight regions, respectively. higher territorial units, which perform not only self-governing but also a statistical function. At the same time, the administrative boundaries of the regions represent territorial statistical units of the NUTS 3 level in the official nomenclature of the Statistical Office and Eurostat. Since 1996, the Slovak Republic has been further divided into 79 districts. Districts represent official statistical units corresponding in the nomenclature to NUTS 4 units, resp. LAU 1.

Table 1. Categories of small and medium-sized enterprises as recommended by the European Commission 2003/361 / EC

	Micro-enterprise	Small business	Medium business
Employees	< 10	< 50	< 250
Annual turnover	≤ 2 mil. EUR	≤ 10 mil. EUR	≤ 50 mil. EUR
Balance sheet total	≤ 2 mil. EUR	≤ 10 mil. EUR	≤ 43 mil. EUR

Source: European Commission Recommendation 2003/361 / EC on the definition of SMEs available at: <https://eur-lex.europa.eu/eli/reco/2003/361/>

Table 2. Territorial-administrative and statistical arrangement of the territory of the Slovak Republic

Unit	Number	Territorial unit
NUTS 1	1	Slovakia
NUTS 2	4	Bratislava Western Slovakia Central Slovakia Eastern Slovakia
NUTS 3	8	regions
NUTS 4/ LAU 1	79	districts
NUTS 5 / LAU 2	2 927	village

Source: <https://www.minv.sk/?uzemne-a-spravne-usporiadanie-slovenskej-republiky>

The primary source of data for the processing of quantitative indicators for the SME sector and socio-economic indicators are databases and data of the Statistical Office of the Slovak Republic, Datacenter and Eurostat for the period from 2010 to 2020. We used regression-correlation analysis. Using a regression-correlation analysis, we evaluated the dependence of the development of the number of SMEs in individual regions of the Slovak Republic on selected macroeconomic indicators: wages, economically active population, regional GDP and unemployment rate. We monitored the impact of these indicators on the development of the number of SMEs in the regions of the Slovak Republic. The course of the dependence is expressed by the analytical form of the regression line (1).

$$\eta_i = \beta_0 + \beta_1 x_i \quad (1)$$

Where β_0 and β_1 are the unknown parameters of the straight line. β_0 is the absolute term of the regression line – loc. constant and β_1 is the regression coefficient. β_1 expresses how many units of measure the value of the dependent variable changes on average if the explanatory variable changes by one unit of measure. The correlation coefficient (2) expresses the dependence between two data. According to the value of the correlation coefficient, we can determine whether the correlation is positive (+1) or negative (-1). If the correlation value approaches 0, it indicates little or no dependency.

$$r = \frac{\sum x_i \cdot y_i - \frac{1}{n} \sum x_i \cdot \sum y_i}{\sqrt{\left[\sum x_i^2 - \frac{1}{n} (\sum x_i)^2 \right] \cdot \left[\sum y_i^2 - \frac{1}{n} (\sum y_i)^2 \right]}} \quad (2)$$

Table 3. Cohen's scale

From	To	Correlation force
+/- 0,00	+/- 0,20	weak to no correlation
+/- 0,21	+/- 0,40	weak
+/- 0,41	+/- 0,60	moderate
+/- 0,61	+/- 0,80	strong
+/- 0,81	+/- 1,00	very strong

Source: <https://doi.org/10.5296/ijhrs.v10i1.16488>

To correctly evaluate and interpret the results of the correlation analysis, we used the Cohen scale, which determines the type of correlation based on the value of the correlation coefficient.

2. LINEAR REGRESSION ANALYSIS OF THE DEVELOPMENT OF THE NUMBER OF SMES IN THE REGIONS OF THE SLOVAK REPUBLIC AND SELECTED MACROECONOMIC INDICATORS

When examining the influence of selected macroeconomic factors on the development of the number of SMEs in the regions of the Slovak Republic, we proceeded from the statistical model of linear regression. Due to the limited scope of the contribution, we focus on only 4 macroeconomic indicators: regional GDP, economically active population of the region, unemployment rate in the region, the number of nominal wages in the region.

Table 4. Development of the number of SMEs in the regions of the Slovak Republic

Region/ Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Region of Bratislava	111969	115256	117545	121735	124110	114238	122774	126464	122 576	130498
Region of Trnava	57629	56890	56425	56690	56644	52971	55528	56559	55184	58500
Region of Trencin	57385	56565	55587	55765	54801	51938	53677	54273	53006	56270
Region of Nitra	65938	65331	65665	67731	68104	64569	68103	68947	67724	72000
Region of Žilina	72329	75535	72512	74502	75534	72365	75386	76199	76552	81581
Region of Banska Bystrica	57098	56394	55870	57385	57409	53952	55856	56650	55849	58425
Region of Prešov	72928	72680	71379	71694	70871	66766	69404	70616	72148	77992
Region of Košice	57449	56957	56625	57999	57768	54209	56394	57423	56802	60477

Source: www.sba.sk

The development of the number of micro, small and medium-sized enterprises in individual regions of the Slovak Republic shows various trends. Our paper aimed to find out what is the dependence of the development of the number of SMEs in individual regions on selected macroeconomic indicators.

When analyzing the dependence of the development of the number of SMEs in the regions on the development of the nominal monthly wage in the region, the values of the correlation coefficient in five regions are close to zero, which means that there is a slight to almost no depend-

ence. The opposite trend is in the regions of Bratislava, Nitra and Žilina, where there is a strong to a very strong dependence of the development of SMEs on the development of nominal wages. In these three cases, the chosen regression line explains the variability to about 60%, the other part represents unexplained variability, the influence of random factors and other unspecified influences.

Table 5. Linear regression analysis of the development of the number of SMEs in the region from the development of the nominal wage for the years 2010 to 2019

Region	Shape of a linear regression line	Regression coefficient	Correlation coefficient (r)	Correlation force
Region of Bratislava	$y = 22,753x - 1419,6$	22,753	0,779	strong
Region of Trnava	$y = 2,7481x + 795,08$	2,7481	0,03	weak to no correlation
Region of Trenčin	$y = -34,918x + 2834,5$	-34,918	0,404	weak
Region of Nitra	$y = 47,863x - 2351,1$	47,863	0,779	strong
Region of Žilina	$y = 40,324x - 2108,6$	40,324	0,814	very strong
Region of Banská Bystrica	$y = 18,727x - 185,59$	18,727	0,18	weak to no correlation
Region of Prešov	$y = 14,833x - 258,52$	14,833	0,374	weak
Region of Košice	$y = 24,723x - 458,13$	24,723	0,321	weak

Source: ŠÚ SR, own processing

When analyzing the dependence of the development of the number of SMEs in the regions on the development of the unemployment rate in the region, the values of the correlation coefficient in 5 regions are close to zero, which represents a slight to no dependence (Trnava and Banská Bystrica region). The opposite trend is in the regions of Nitra and Žilina, where there is a strong negative dependence of the development of SMEs on the development of the unemployment rate. In these two cases, the chosen regression line explains the variability at the level of 50%, the other part represents unexplained variability, ie the influence of random factors and other unspecified influences.

Table 6. Linear regression analysis of the development of the number of SMEs in the region from the development of the unemployment rate in the region from 2010 to 2019

Region	Shape of a linear regression line	Regression coefficient	Correlation coefficient (r)	Correlation force
Region of Bratislava	$y = -0,1757x + 26,069$	-0,1757	0,581	moderate
Region of Trnava	$y = 0,0803x + 1,71$	0,0803	0,041	weak to no correlation
Region of Trenčin	$y = 0,7865x - 35,811$	0,7865	0,415	moderate
Region of Nitra	$y = -1,4191x + 104,63$	-1,4191	0,708	strong
Region of Žilina	$y = -0,8764x + 74,692$	-0,8764	0,674	strong
Region of Banská Bystrica	$y = -0,5363x + 44,805$	-0,5363	0,121	weak to no correlation
Region of Prešov	$y = -0,4949x + 50,466$	-0,4949	0,302	weak
Region of Košice	$y = -0,9035x + 65,801$	-0,9035	0,325	weak

Source: ŠÚ SR, own processing

When analyzing the dependence of the development of the number of SMEs in the regions on the development of the number of the economically active population in the region, the values of the correlation coefficient in all regions approach zero, which represents a slight to almost no dependence. In these cases, the chosen regression line explains the variability at the level of approximately 10% to 23%.

Table 7. Linear regression analysis of the development of the number of SMEs in the region from the development of the number of economically active population in the years 2010 to 2019

Region	Shape of a linear regression line	Regression coefficient	Correlation coefficient (r)	Correlation force
Region of Bratislava	$y = 0,6798x + 262,71$	0,6798	0,480	moderate
Region of Trnava	$y = 0,6767x + 253,48$	0,6767	0,227	weak
Region of Trenčín	$y = -0,0758x + 305,43$	-0,0758	0,376	weak
Region of Nitra	$y = -0,6713x + 393,19$	-0,6713	0,066	weak to no correlation
Region of Žilina	$y = 0,0943x + 329,59$	0,0943	0,289	weak
Region of Banská Bystrica	$y = 1,0644x + 264,16$	1,0644	0,21	weak
Region of Prešov	$y = 0,1569x + 383,34$	0,1569	0,065	weak to no correlation
Region of Košice	$y = 2,3015x + 236,74$	2,3015	0,404	moderate

Source: ŠÚ SR, own processing

When analyzing the dependence of the development of the number of SMEs in the regions on the development of the value of regional GDP in the region, the values of the correlation coefficient in five regions are close to zero, which expresses a slight to almost no dependence. The opposite trend is in the regions of Bratislava, Nitra and Žilina, where there is a strong to a very strong dependence of the development of SMEs on the development of the value of regional GDP. In these three cases, the chosen regression line explains the variability to approximately 69%, the other part represents unexplained variability, the influence of random factors and other unspecified influences.

Table 8. Linear regression analysis of the development of the number of SMEs in the region from the development of the value of regional GDP for the years 2010 to 2019

Region	Shape of a linear regression line	Regression coefficient	Correlation coefficient (r)	Correlation force
Region of Bratislava	$y = 319,2x - 16118$	319,2	0,768	strong
Region of Trnava	$y = 510,86x - 27975$	510,86	0,311	weak
Region of Trenčín	$y = -136,92x + 14812$	-136,92	0,478	moderate
Region of Nitra	$y = 281,05x - 10472$	281,05	0,748	strong
Region of Žilina	$y = 271,3x - 11626$	271,3	0,831	very strong
Region of Banská Bystrica	$y = 68,235x + 3042$	68,235	0,118	weak to no correlation
Region of Prešov	$y = 90,751x + 630,94$	90,751	0,258	weak
Region of Košice	$y = 194,26x - 1869$	194,26	0,271	weak

Source: ŠÚ SR, own processing

3. CONCLUSION

Based on the results of our regression-correlation analysis, we can state that only in three regions of the Slovak Republic (Bratislava, Nitra and Žilina) there is a strong to very strong dependence between the development of the number of SMEs in the regions and selected macroeconomic indicators. Other regions show little to no dependence. Thus, the development of the number of SMEs in the regions is largely dependent on other quantitative as well as qualitative factors. Their analysis will be the subject of our further research.

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