



**The Development of the Innovative SMEs in Slovakia in the Context of Macroeconomic Environment**

**Vusal AHMADOV**, Ph.D. Student  
University of Szeged  
Doctoral School of Economics  
Szeged, Hungary  
[vusal.ahmadov93@gmail.com](mailto:vusal.ahmadov93@gmail.com)  
ORCID: 0000-0001-8153-671X

**Abstract**

EU integration brought expressive economic development to Slovakia. The main drivers of the economic growth have been export-oriented FDIs. Slovak government pursues provision of the favorable FDI-friendly business environment for keeping continuance of the productive capital into domestic economy. Nevertheless, the FDIs represent giant multinational companies and the Slovak economy is in a stage of development that it needs the advancement in the productivity growth in the remaining sectors of the economy addition to export-intensive FDIs. From this token, development of the SME in Slovakia is important for transition of the Slovak economy up to next level.

In this article, I analyze the effects of the macro-economic variables such as financial development, export growth, innovativeness, and the EU structural funds on SME development in Slovakia. I deploy regression analysis to measure these effects. The lower interest rates and higher export growth positively contributes to development of innovative SMEs. The inadequacy of the organizational capacity and innovation structure of SMEs impedes them benefits from EU funds and Innovations.

**Keywords:** SME productivity, EU funds, cost of finance, innovation structure, organizational structure

**Introduction**

Since last three decades the research on importance of small business in development of national economy has begun to challenge the long-standing hegemonic view of considering large companies as engine of economy in the background of neglecting small companies. From this token, the investigation of the SME development in post-socialist Slovakia has importance in understanding the prospect of its economic development. The studies on SME development entails both the effects of the macroeconomic environment and firm-specific issues on SME performance. This paper follows former line of studies and focuses on the analysis of the effect of the macroeconomic environment on the SME performance.

The development of SMEs in Slovakia began with privatization of small trade and service enterprises and legalization of business activity in early 1990s. The large-scale market reforms and following macroeconomic improvement contributed to development of SMEs in Slovakia. The number of the registered SMEs increased from 290 thousand subjects in 1993 to 570 thousand in 2018 (Slovak Central Statistics Office). The main rise in SMEs was experienced as result of market reforms and EU integrations. The SMEs has special place in Slovakian economy. The 99.9 percent of the registered business are SMEs and 72 percent of employed people are in SMEs which is slightly higher than 66.6 percent EU average. The 55.1 of national output is produced by SMEs which is close to 56.4 percent of EU average (EC 2020). Reconciling the higher share of SME employment with their contribution to GDP, it is obvious that labor productivity of SME employees is considerably lower than EU average.

The integration to EU contributed to significant advancement in Slovak economy. From 2000 till global financial crisis, Slovakia was one of the best performers in GDP growth at average 6 percent. Excepting 5.5 percent fall in GDP in 2009, Slovakia experienced positive GDP growth rate after crisis until today (WB). The main engines of the galloping GDP growth have been FDI-led export sectors. The annual average of the share of FDI to GDP stood at over 7 percent from 2000 until financial crisis (OECD). The value of exports increased from 13.4 billion USD in 1998 to 98.2 billion USD in 2019. R&D spending share of GDP initially fell from 0.64 percent in 2000 to 0.47 percent in 2009 then rose gradually rose to 0.83 percent in 2019 (OECD). The amount of EU structural funds to Slovak economy between 2004 and 2020 accumulated at 29.5 billion euro (EC 2020). The fiscal reforms and EU integration increased the credibility of Slovakia and interest rate on government bonds fell from 8 percent in 2001 to 0.25 percent in 2019 (OECD). Despite the crisis contributed to rising in unemployment, unemployment rate leveled at 5.6 percent in 2019 (WB).

The socio-economic role of the SMEs in employing the workforce in Slovakia is unquestionable. Other significances of SMEs for Slovak economy come from feature of the current state of the Slovak economy as well as the SMEs` characters. Slovakia achieved envying level economic development via FDI-led export growth strategy and stands one step behind advanced economies as middle-income emerging economy. The galloping export sectors have been dominated mostly by giant multinational companies and the prospect of these sectors to transform entire Slovak economy to advanced Western economy is limited. In order to pass this stage to reach the level of Western economy the dissemination of the knowledge-based production among SMEs is important. The labor productivity of the Slovak SMEs is considerably lower than larger firms. The knowledge-based innovative SMEs are cornerstone of the increasing the labor productivity of the SMEs in Slovakia and raise the overall socio-economic development of the Slovakia to Western level. The export growth and lower cost of capital are helpful to improve productivity in SMEs. While impediment on benefiting from EU funds and innovative environment are barriers on SME development.

Considering the importance of the innovative SMEs in transformation of the Slovak economy to upper level, the following question need to be answered. What is the effect of the macroeconomic environment of the Slovak economy on the enhancing SME productivity? In searching answer for this question, I will evaluate the effects of the cost of financing, export growth, innovativeness level and EU structural funds on the productivity growth of SMEs. I will employ regression analysis for measuring the effects of the mentioned explanatory variables on SME productivity growth.

The previous studies focus on the evaluation of SME performance, the financial constraint of SME development, SME innovativeness in Slovakia (Wilson and Kacer 2016; Lesakova 2013; Puskarova and Zajac 2014). This paper is first to introduce the effect of the macroeconomic environment on SME productivity.

### **Theoretical background**

Despite smallness brings several limits on SME development, it also gives advantages of the flexibility which is essential in fast-changing competitive market environment. The small companies have closer relations and frequent contact with their customers which allows to better understand their needs. Absence of the hierarchical bureaucracy as in larger companies and closer relations with employees allows fast decisional process in the reality of changing markets. At the same time, lower cost of job creation and fixed costs gives cost opportunity for small companies. Altogether, these opportunities enable SMEs to adjust faster to changing demand of markets (Savlovschi and Robu 2011; Karadag 2015).

There are couple of the disadvantages inherent to smallness which impede the SMEs to reach their growth potential. Small companies have difficulty in access to external finance. Considering their size, the SMEs do not have luxury of attracting external finance by issuing bonds and shares as large companies. Therefore, the commercial banks are main source of external finance for small firms. The banks are reluctant to lend small companies because with insufficient amount of fixed assets to guarantee the loans. Additionally, the small businesses lack proper record of business for external users to evaluate the prospect of their loan applications. Therefore, the banks charge higher interest rates on SMEs than larger companies. The burden of the taxes and bureaucratic regulation are considerably higher on small companies compared to larger ones. The profitability of small businesses is considerably lower than large companies therefore, the higher taxes can hurt small firms harder than larger ones. Contrast to larger companies, the majority of the small businesses don't have separate body to deal with bureaucratic legislation. The complicated regulations can waste insufficient resources of SMEs. Therefore, the simplified version of the business regulation is suitable for small companies. Deficiency of human resource capacity is another barrier on the small businesses. Small companies experience both inadequacy of managerial capacity and low qualification of the employees. SMEs cannot compete for high skilled labor force with large corporations. The problems in access to new technologies due to reluctance of technology providers and inadequacy of capable employees is impeding factor on SME growth (Karadag 2016; Karadag 2015; Klonowski 2011; Abdulsaleh and Worthington, 2013)

Wozniak et al (2019) analyze the effect of the macroeconomic environment on SME growth in Poland and propose that economic development of GDP per capita, unemployment rate, inflation and export have a positive effect on SME growth. Ippinnaiye et al (2017) investigate the drivers of SME growth in Ireland in the period of 1993-2007 by employing multivariate approach of integrating macroeconomic determinants with firm-specific ones. They conclude that firms adjust their strategies in regards to changing in macroeconomic environment. Involvement in foreign trade has positive effect on SME performance. Firstly, exporting opens opportunity of access to global markets. Secondly, firms can benefit from exporting for improving their competitiveness and organizational structure. Addition to benefits of exports, the importing enable SMEs to access to high quality and wide range of inputs at competitive prices. Ippinnaiye et al's study consider the effect of exchange rate negligible in Ireland case. Their study suggests that increase in the availability of the credit resources for SMEs has positive effect on the SME growth.

Stotz and Schrammel (2014) investigates the effect of the EU supports on SME development in Southeast Europe and claims that the organizational deficiency of the small companies hinders the absorption of EU funds in this region. By analyzing the effect of the EU structural funds on SME performance in Romania, Hunya (2011) comes the similar conclusion. The small companies lack organizational and market skills to participate in complex tenders and implement firm development strategies. Banai et al (2020) state that the EU subsidies increase the turnover and employment of SMEs but the effect on labor productivity is not significant. The EU funds enhance capacity rather than efficiency in Hungary case.

The FDI-driven export-led growth strategy contributed to economic development of Slovakia in the context of EU integration. The next stage of the development is the upgrading of the productivity of the remaining sector of the economy and the SMEs are its integral part. Despite the Slovak GDP per capita rose to over 60 percent of the EU average, the main engines of this development are giant multinational companies in mainly automobile industry and the small companies are far behind EU average in term of economic development. Despite the rise in the number of SMEs implemented innovations, the SME productivity per capita is considerably backward at 41 percent of EU average (EC 2020).

Lesakova (2013) claims that one the main reasons for underperformance of the SME innovation in Slovakia is the lack of capital, especially venture capital. The company resources are the main source of the financing innovations. Ivanova (2017) comes to similar conclusion and states that the SMEs in Slovakia have difficulty in access to external finances such as bank loans, grants and EU funds due to complexity of the approval of the applications and strict criteria for assessment of the financial capability. The lack of the innovation infrastructure and the lack of the innovation capacity of the SMEs are other obstacle on the enhancement of their capacity and efficiency in Slovakia. Therefore, innovation intermediaries such as technological incubators, innovation and technology centers, scientific parks and research cooperation are necessary to improve innovation structure of Slovak economy and innovation capacity of SMEs (Lesakova 2013; Ivanova 2017; Haviernikova and Srovnalikova 2016).

Slovakia perform worse among EU countries in term of SME internationalizations. The share of the SMEs in total Slovak exports and imports does not exceed one third (EC 2019). Nonetheless, the achievement of the Slovak SMEs is not success example, the EU funds has played significant role in the improvement in the entrepreneurship and the SME performance. EU participate in co-financing of the project for promoting local entrepreneurship and provision of the training for startups.

In the next sections, I will test the hypothesis that the macroeconomic variables such as cost of the finance, spending on innovations, exports and EU structural funds have effect on the SME productivity in Slovakia.

### **Data and Methodology**

I deploy the multiple regression analysis to evaluate the effects of macroeconomic environment on the SME productivity. This model estimates the effects of the independent variables such as interest rates, R&D spending, export by SMEs and EU structural funds on the productivity of the Slovakian SMEs.

$$Y=b_1X_1+b_2X_2+b_3X_3+b_4X_4+\varepsilon$$

Y stands for SME productivity,  $X_1$  – interest rate,  $b_1$  its regression coefficient,  $X_2$ -R&D spending and  $b_2$  its coefficient,  $X_3$ -SME export and  $b_3$  its coefficient,  $X_4$ -EU structural funds and  $b_4$  its coefficient and  $\varepsilon$  is error term which is outside of the model explanation.

I refer to OECD and EuroStat database as data source. The dataset covers 2004-2018 period. Slovakia joined EU and began access to EU structural funds in 2004 therefore, I chose the year 2004 as beginning point. The importance of the SMEs in national economy recently came to agenda of academic sphere and public policy. Therefore, there is a problem of the finding of consistence data on SME statistics. This model lacks the SME export data for years before 2007. In the SPSS software program, I handle it by excluding those missing data. I calculate the SME productivity by dividing annual SME outputs by SME employment in respective years.

## Results and Discussion

### Findings

I deployed the multiple regression analysis to test the effect of the macroeconomic environment within the context of independent variables of this paper on SME productivity. The first interpretation of the model shows that macroeconomic environment has significant effect on SME productivity. The table 1 shows that the  $R^2$  is 0,677 at the p-value of 0,160. This indicates that change in the macroeconomic indicators stands for 67.7 percent of the change in SME productivity at 84 percent accuracy (1-p-value). According to conventional way of interpretation, we should be sceptic on stating that macroeconomic environment has effect on SME productivity in case that p-value is above 0,05. But small number of the samples born from shorter time frame like in this case makes p-value be higher than 0,05 inevitable. Additionally, the p-value of this analysis (0,160) can be considered as small. Therefore, it is statistically correct to state existence of the effect of the macroeconomic environment on SME productivity in Slovakia. Another important finding regards the effect of the separate macroeconomic indicators. Table 2 shows that the cost of finance has significant effect (0,736) on SME productivity followed by SME export (0,486). The result of the regression analysis indicates non-positive effects of the EU structural fund and innovation spending on SME productivity in Slovakia.

**Table 1. Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	R Square Change	F Change	Sig. F Change	Durbin-Watson
1	,823 <sup>a</sup>	,677	,418	1891,3666366744440		,677	2,615	,160	1,798

a Predictors: (Constant), Interest rate, SME export, Innovation spending, EU structural fund

b Dependent Variable: SME productivity

Table 2. Correlations

Correlations	SME productivity	EU structural fund	Innovation spending	SME export
Interest rate				
Pearson Correlation				
SME productivity	1,000	-,756	-,423	,486
EU structural fund	-,756	1,000	,455	-,380
Innovation spending	-,423	,455	1,000	-,230
SME export	,486	-,380	-,230	1,000
Interest rate	,736	-,786	-,465	,270
Sig. (1-tailed)				
SME productivity	.	,006	,111	,077
EU structural fund	,006	.	,093	,139
Innovation spending	,111	,093	.	,261
SME export	,077	,139	,261	.
Interest rate	,008	,004	,088	,225

### Discussion

I analyzed the SME productivity under the influence of the macroeconomic environment in Slovakia. The model estimates that cost of finance is most influential factor among macroeconomic indicators on SME productivity in Slovakia. This result is in congruence with Lesakova (2013) that external finance is decisive for SME performance. The lower cost of finance can increase the profitability of the investment and motivate small businesses to move to better technologies. Another important finding of the model is that export by SMEs has considerable effect on their productivity. In line with Ipinnaiye et al` (2017) conclusion for Ireland case, export allows SMEs to access to global markets and competition in global market compels them continuous improvement organizational structure and technological capacity in Slovakia.

Contrast to expectation, this model indicates the negative correlations between EU structural fund SME productivity and R&D spending and SME productivity. Regarding the existence of the channel of the positive effect of the structural fund and innovation spending on SME performance we cannot state that they have detrimental effects on SME productivity in Slovakia. From this logic, we can claim that EU structural fund and R&D spending are not effective in improving SME performance. Agreeing with conclusion of Stotz and Schrammels` (2014) analysis in Southern European case, it can be claimed that the inadequacy of linking mechanism of the EU funds to SMEs and the deficiency of the organizational capacity of small companies makes harder SMEs absorb those funds in the direction of the improving their efficiency. The ineffectiveness of R&D spending to contribute to improvement of the SME productivity can be explained by lack of innovation capacity of the Slovakian small business similar with Lesokova`s (2013) conclusion.

More than five years of the analyzed period of this study covers the extraordinary times of global financial crisis and consequent post-crisis period between 2008 and 2012. Therefore, I had to give general conclusion of the effect of macroeconomic performance on SME

productivity including data of unusual times. Due to availability of the data from 2004 for EU funds to Slovakia and SME export, I had to analyze shorter period in which crisis years have considerable weight. Further study on analysis of the effect of macroeconomic environment on SME performance during crisis period in Slovakia can give completer insight of the SME efficiency in the macroeconomic context.

### **Conclusion**

In the context of the EU integration, the export-oriented FDIs significantly contributed to economic development of the Slovak economy. In this regard, the large multinational companies have stood as locomotive of the economic development. Nevertheless, the Slovak economy came to a stage that the diffusion of the efficiency upgrading to overall economy beside multinationals are necessary for upgrading the economy to next level. From this token, the efficiency enhancement of the SMEs is the main issue to be achieved. In this paper, I analyzed the effects of the macroeconomic environment in the form of EU funds, cost of finance, SME exports and R&D spending on SME productivity. The result of my analysis shows that cost of finance and export by small business have considerable effect on SME productivity. The lower interest rate makes the investment opportunity profitable and contribute to shifting better technology. Involvement in exports opens the larger global markets for SMEs and necessitates to advance organizational and technological capacity. EU funds and R&D spending don't have considerable effect on SME productivity due to the lack of organizational capacity of SMEs and inadequacy of linkage.

Despite its positive effect on SME productivity, the SME export is considerably lower. Therefore, the Slovak government instigate integration of SMEs into global markets for exploiting the benefits of export to efficiency of small companies. Considering the lower organizational and technological capacity of SMEs to absorb the positive effects of the EU funds and innovations, government assistance is necessary for upgrading their mentioned weakness.

### **References**

- A.Abdulsaleh and A. Worthington (2013) "Small and Medium-Sized Enterprises Financing: A Review of Literature", *International Journal of Business and Management*, 8(14), 122-141
- A.Banai, P.Lang, G.Nagy and M.Stancsics (2020), "Waste of money or growth opportunity: The causal effect of EU subsidies on Hungarian SMEs", *Economic Systems*, 44(1), 98-112
- D.Klonowski (2012) "Liquidity gaps in financing the SME sector in an emerging market: evidence from Poland, *International Journal of Emerging Markets*", 7 (3), 335-355
- EC (2019) 2019 SBA Fact Sheet, Slovakia, European Commission, Brussels
- EC (2020) Eurostat regional Yearbook, European Commission, Brussels
- E.Ivanova (2017) "Barriers to the development of SMEs in the Slovak Republic", *Oeconomia Copernicana*, 8(2), 255–272
- G.Hunya (2011) "Problems of Romanian SMEs with tapping EU structural funds", *Eastern Journal of European Studies*, 2(1), 129-146
- H.Karadag (2015) "The Role and Challenges of Small and Medium-sized Enterprises (Smes) in Emerging Economies: An Analysis from Turkey" *Business and Management Studies*, 1(2), 23-38

H.Karadag (2016) "The Role of SMEs and Entrepreneurship on Economic Growth in Emerging Economies within the Post-Crisis Era: an Analysis from Turkey" *Journal of Small Business and Entrepreneurship Development*, 4(1), 22-31

K.Havierniková and P.Srovnalíková (2016) "Selected categories of levies and their impact on economic results of small and medium-sized enterprises" *Actual Problems of Economics*, 11(3) 123-141

L. Lesakova (2013) "Evaluating Innovations in Small and Medium Enterprises in Slovakia" *Procedia - Social and Behavioral Sciences*, 110, 74-81

L. Savlovschi and N.Robu (2011) "The role of SMEs in modern economy" *Economia. Seria Management*, 14(1), 13-19

M.Wozniak, J.Duda, A.Gasior and T.Bernat (2019) "Relations of GDP growth and development of SMEs in Poland", *Procedia Computer Science*, 159, 2470-2480

N. Wilson, P. Ochotnický and M. Kacer (2016) "Creation and destruction in transition economies: The SME sector in Slovakia" *International Small Business Journal*, 34(5), 579-600

O.Ipinnaiye, D.Dineen and H.Lenihan (2017), "Drivers of SME performance: a holistic and multivariate approach", *Small Business Economics*, 48, 883-911

OECD Data, Long-term interest rates, retrieved from <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=SK&view=chart>

OECD Data, Gross domestic Spending on R&D spending, retrieved from <https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>

P.Puskarova and S. Zajac (2014) "Innovation and Competitiveness of the Slovak Economy: New Evidence of International Impacts in the Knowledge Accumulation Process" 42(1), 81-97

Slovak Republic National Statistics Office, Business Statistics, Enterprise births in the SR by NACE Rev. 2 and size class category by number of employees, retrieved from [http://datacube.statistics.sk/#!/view/en/VBD\\_SLOVSTAT/og2005rs/v\\_og2005rs\\_00\\_00\\_00\\_en](http://datacube.statistics.sk/#!/view/en/VBD_SLOVSTAT/og2005rs/v_og2005rs_00_00_00_en)

T.Stolz and T.Schrammel (2014) "Business Membership organizations as a policy approach to increase SME's EU funds absorption" 7<sup>th</sup> International Conference for Entrepreneurship, Innovation and Regional Development (ICEIRD), Nicosia, Cyprus, 5-6, 2014

World Bank, Labor Market Indicators, Unemployment, total (% of total labor force) (modeled ILO estimate) retrieved from <https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?locations=SK>

World Bank, Economy and Growth, GDP growth, retrieved from <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=SK&view=chart>

World Bank, Foreign direct investment, net inflows (% of GDP), retrieved from <https://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS?locations=SK>