

IMPORTANCE OF ROAD INFRASTRUCTURE IN THE ECONOMIC DEVELOPMENT AND COMPETITIVENESS

Eva Ivanova¹, Jana Masarova²

^{1,2}Alexander Dubcek University of Trencin, Slovakia

crossref <http://dx.doi.org/10.5755/j01.em.18.2.4253>

Abstract

Purpose. *The main goal of the presented paper is to highlight the effects of road infrastructure development on the economic growth and competitiveness of Slovak economy. We focused on the quality of the road network in the Slovak Republic (SR), in particular motorways and expressways. It is the density and the quality of the road infrastructure which primarily determine the competitiveness of the country. The paper also addresses the issue of expenditures and sources of funding related to road infrastructure in the Slovak Republic. In addition, we analyze the road infrastructure in relation to competitiveness and the inflow of foreign direct investments (FDI) to the Slovak Republic. Moreover, we look at the road infrastructure in relation to gross domestic product (GDP) and foreign direct investment.*

Methodology. *We used the method of time series and correlation method when dealing with the subject matter and when analyzing the effects of road infrastructure development on the economic growth and increase of competitiveness of Slovak economy.*

The method of synthesis is used to draw conclusions and the method of comparison is used to compare general tendencies in the areas of road infrastructure, GDP and FDI. We use the time series analysis from 2000 until 2011 to examine the issues. Based on the analysis, we underscore the correlation between the GDP development and road infrastructure expenditures on the one hand and the inflow of foreign direct investments to the Slovak economy and its competitiveness on the other hand.

The type of the article: *Research report.*

Keywords: *Road infrastructure, expenditure on roads, resources of road infrastructure funding, gross domestic product, competitiveness.*

JEL Classification: *H54, R42, O18.*

1. Introduction

The fundamental factors which determine the ability of the economy to achieve economic growth are economic resources available to the society and efficiency of their use (Janský, 2011, p. 94). The paper addresses one of the issues of state and regional development, such as the road infrastructure, which is considered to be a key prerequisite of social and economic development of any country. This is particularly true in the Slovak Republic where the road transport is the most widely used mode of travel. Since the importance of the road network transcends national boundaries, the expansion and upgrade of the road network is vital to increase economic performance. Hence, poor road infrastructure poses hindrance to foreign investments in countries depending on them in terms of their economic performance and competitiveness enhancement.

The first part of this paper discusses key aspects of the road infrastructure development such as conditions of the road development, investments and funding sources. The level of the road infrastructure development will be correlated with the GDP development in Slovakia.

The second part of this article addresses the influx of foreign direct investment to Slovakia and their impact on the economic growth. Finally, the development of competitiveness of the Slovak Republic which is determined by several distinct factors, including the road infrastructure and FDI will be dealt with.

The aim of this paper is to look at the chosen indicators and analyse and assess their interdependence, and thus contribute to the scientific understanding of the subject, marked by a lack of agreement, in particular regarding the use of investment incentives for FDI and financing the road infrastructure development.

2. Method

We use the time series analysis to examine the development of road network in Slovakia, expenditures on the Slovak road infrastructure, economic growth and foreign direct investment. We look these indicators from 2000 until 2011, in order to show the trend of their development in recent years.

We use the method of comparison to compare general tendencies in the areas of road infrastructure, gross domestic product and foreign direct investments. We compare the position of Slovakia at the level of competitiveness.

We underscore the correlation between indicators: gross domestic product, foreign direct investment, expenditure on road infrastructure.

Regression analysis shows a correlation between the level of GDP and expenditure on road infrastructure.

The method of synthesis is used to summarize the findings and draw conclusions.

Data are taken from the databases of these institutions: Statistical Office of the SR, Road Databank of the Slovak Road Administration, Ministry of Transport, Construction and Regional Development of the SR, National Bank of Slovakia, World Bank, World Economic forum, Institute for Management Development IMD.

3. Results

Road infrastructure and its role

The road infrastructure comprises all types of roads in a given area, including various structures and serves to transport passengers and goods. The road infrastructure includes all road categories, facilities, structures, signage and markings, electrical systems, and so on needed to provide for safe, trouble-free and efficient traffic.

Extensive network of roads of high quality is essential for trouble-free road transport, which is the most widely-used mode of transport in Slovakia. The advantages of road transport include transporting passengers and carrying goods regardless of distance directly to a destination, the relatively high speed and no time restrictions. Road transport and its infrastructure enable to carry people as well as materials, raw materials, semi-finished and finished products intended for sale. Road infrastructure affects the flexibility and mobility of the workforce, which is reflected in the employment level. Moreover, higher employment level makes the standard of living grow. The degree to which the road infrastructure is developed has an impact on several areas, such as for instance the development of tourism, influx of foreign investments, regional development, etc.

Eventually, all the indicators – employment, wages, consumption, savings, investment, benefits of tourism – will have an impact on the volume of gross domestic product, the key macroeconomic indicator, which measures the economic output of the state. In addition, transport is significant in international context in terms of foreign trade and cooperation in different areas.

Advantageous geographical location of Slovakia in Europe increases the importance of road infrastructure in international context. In this respect, a well-developed network of roads and superior road infrastructure (motorways and expressways) are required. However, all categories of roads are needed in the country and its regions.

Development of road infrastructure in the SR

Roads in Slovakia were built, expanded and upgraded depending on the political and economic situation in the country. The main trade routes and mining roads were in the best

condition. In principle, following the First World War, the network of roads was of poor quality and communications were narrow and unpaved. It was only after the Second World War when a uniform network of roads was established. In former Czechoslovakia, the road network in Slovakia was less developed and of poorer quality than in the Czech Republic. Problems related to funding also occurred when the independent Slovak Republic was founded in 1993. The problems were related to the transfer of funding from Czechoslovak to Slovak resources. Since 1993, sections of motorways and expressways have been built and necessary repairs and refurbishment of roads of other types have been made. Since 1993, several sections of motorways and expressways have been constructed and other category roads have been repaired and refurbished.

The Slovak road infrastructure consists of road communications, local and special purpose roads. The local road length statistics is assessed every five years (in 2011, the length was 25,350.9 km). The special purpose road length is not statistically assessed. Therefore, the paper addresses only the development of road communications, i.e. motorways, expressways, 1st class roads, 2nd class roads and 3rd class roads.

Motorways and expressways are meant to connect by routes the principal metropolitan areas both domestic and those of neighbouring countries. They are of special economic importance. They are labelled as the superior road infrastructure.

1st class roads are a fundamental component of the road network connecting cities, regions, and border crossings and are of special significance for national and international transportation. 2nd class and 3rd class roads are mainly used for commuting to cities.

The development of all categories of roads is listed in Table 1.

Table 1. Development of the road network in the SR in 2000-2011 (km)

Year	Roads and motorways						Road network in total
	Motorways and motorway feeders	Out of it Motorways	Expressways *	1 st class roads	2 nd class roads	3 rd class roads	
2000	295.7	295.7	26.9	3 221.7	3 826.3	10 393.7	17 737.4
2001	298.7	296.4	26.9	3 220.4	3 827.9	10 391.4	17 738.4
2002	306.5	301.6	52.3	3 224.3	3 828.7	10 395.5	17 754.9
2003	317.7	312.8	65.9	3 334.7	3 728.7	10 396.0	17 777.0
2004	322.4	316.2	78.0	3 341.3	3 729.0	10 393.9	17 786.5
2005	333.7	327.5	79.7	3 341.1	3 733.5	10 400.6	17 809.0
2006	333.7	327.5	153.2	3 359.0	3 742.1	10 399.0	17 833.8
2007	372.5	364.5	158.5	3 365.9	3 742.4	10 402.1	17 882.9
2008	392.8	384.0	159.3	3 434.3	3 686.3	10 402.3	17 915.7
2009	399.9	391.0	179.7	3 316.5	3 643.7	10 406.4	17 946.1
2010	426.8	415.7	189.5	3 317.5	3 643.2	10 408.3	17 985.4
2011	430.3	419.2	242.2	3 316.7	3 639.0	10 411.4	18 039.7
ΔX	134.6	123.5	215.3	95.0	-187.3	17.7	302.3
P	45.52	41.77	800.37	2.95	-4.90	0.17	1.70

*from 2000 to 2008, expressways were included in the 1st class roads

ΔX – absolute increase of individual categories of road communications in 2000-2011 in km

P – pace of growth of individual categories of road communications in 2000-2011 in %

Source: compiled by authors, based on the data from the Road Databank of the Slovak Road Administration, Statistical Office of the SR (SO) and Ministry of Transport, Construction and Regional Development of the SR (MTCRD), calculated by authors

It follows from the data listed in Table 1 that there was a gradual increase of the road communication length in 2000 – 2011. The motorway and motorway feeder length increased by 134.6

km, i.e. by 45.52%. The expressway length has increased 8 fold (increase by 215.3 km) since 2000. Conversely, the 2st class roads length decreased by 187.3 km which can be attributed to the process of road reclassification or removal from the register of roads. There was only a slight increase in 3st class roads length (17.7 km). The total length of road communications increased by 302.3 km. The comparison of the Slovak road network structure in 2000 and 2011 is shown in Figure 1.

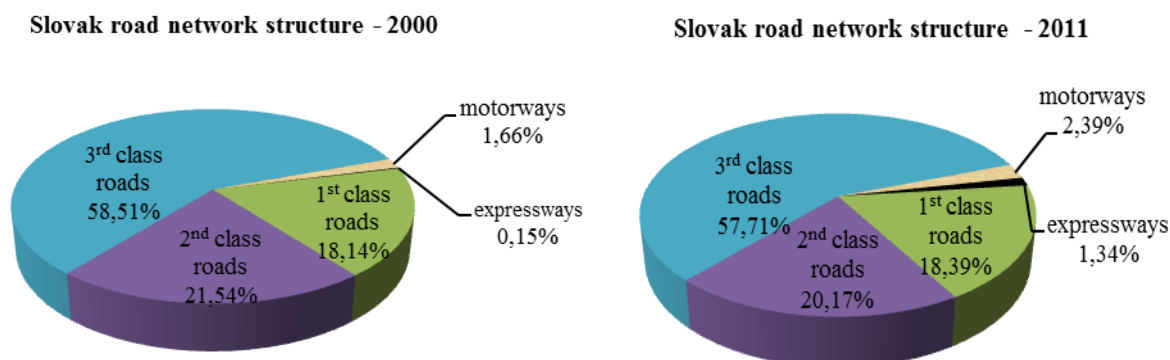


Figure 1. Comparison of the Slovak road network structure in 2000 and 2011

Source: compiled by authors

It follows that the proportion of motorways and motorway feeders in the network of roads was merely 1.66% and that of expressways was merely 0.15% in 2000. In the period of time 2000 – 2011, the proportion of motorways increased to 2.39% and that of expressways to 1.34%. The 1st class roads proportion increased slightly and the 2st class roads and 3st class roads proportion decreased.

It follows from the analysis that the road network length increases gradually, however, it is evident that the proportion of motorways and expressways is insufficient. Moreover, concerns are being raised over poor conditions of roads and their structures, in particular bridges. Therefore, adequate attention should be paid to further development and enhancement of the road infrastructure.

Development of investments in the Slovak road infrastructure

Total expenditures on the road infrastructure are broken down into investment expenditures and expenditures on road maintenance and repair. Maintenance and repair cover works to maintain roads serviceable and technically adequate under all weather conditions. Investment expenditures on road infrastructure cover the costs on building new roads or refurbishing the existing ones.

Expenditures on road infrastructure based on the data obtained from the Ministry of Transport, Construction and Regional Development of the SR are listed in Table 2.

Table 2. Expenditures on the Slovak road infrastructure (in million EUR, current prices)

Year	2000	2001	2002	2003	2004	2005
Investments	227.3	201.3	239.1	210.3	240.0	360.0
Maintenance	66.6	67.8	68.9	72.0	64.5	100.3
Total	293.9	269.1	308.0	282.3	304.5	460.3
% increase	-	-8.44	14.46	-8.34	7.86	51.17
Year	2006	2007	2008	2009	2010	2011
Investments	410.7	520.1	587.7	661.6	342.1	431.9
Maintenance	130.4	155.6	167.4	192.4	174.7	159.6
Total	541.0	675.7	755.1	854.0	516.8	591.5
% increase	17.53	24.90	11.75	13.10	-39.48	14.45

Source: Statistical survey data by MTCRD SR, calculated by authors

The amount of spending on building and refurbishing road infrastructure fluctuated until 2005 and grew till 2009. However, this positive trend was affected by the recession. Thus, expenditures, notably investment expenditures, on road infrastructure decreased almost by 40% in 2010 in comparison to 2009.

Investment expenditures roughly represent $\frac{3}{4}$ out of total expenditures on road infrastructure while their amount depends on the state budget, amount of loans, options to draw finance from the European Union funds, and economic development of the country. In 2010, the investment expenditure proportion decreased to 66% out of total expenditures on road infrastructure.

It can be concluded that the amount of expenditures on road infrastructure is still too low in terms of increasing number of motor cars and large volume of motor vehicle traffic.

It is worth mentioning that building and upgrading road infrastructure is time-consuming and complex in terms of financing, hence multi-source financing should be opted for.

Sources to finance the Slovak road infrastructure

Investments in road infrastructure can be state or private. Nowadays, the essential sources of financing the Slovak road infrastructure:

- ⇒ public budgets,
- ⇒ revenues from tolls or user charges,
- ⇒ European Union funds,
- ⇒ soft loans from Slovak and foreign banks,
- ⇒ private sources (sources of public-private partnerships - PPP projects).

The system of public budgets is made up of the state budget and budgets of lower governmental level, such as for instance local government budgets. Building and maintaining motorways, expressways and 1st class roads are financed from the state budget. Building and maintaining 2nd class and 3rd class roads are financed from the respective local government budget. Building and maintaining local roads are financed from the respective municipal budgets.

In addition, revenues from using the network of roads are used to finance the road infrastructure. These include, in particular, revenues from taxes on motor vehicles, sale of motorway stickers and tolls.

Motor vehicle tax (road tax) is to be paid only by natural persons and legal entities registered in the Commercial Register. Revenues from this tax represent the revenues of self-governing regions that set the tax and the revenue to fund the 2nd and 3rd class roads.

In addition, motorway users have to purchase a motorway sticker. It is a fixed amount of money which users of the motorways are required to pay regardless of how often they use them. Motorway stickers must be purchased by all users of paid motorways and roads (excluding vehicles over 3.5 t that are required to pay a toll as of 1 January 2010). The money collected is primarily used to maintain and repair motorways and expressways.

Another source is a per mile road user charge. The Slovak toll collection system was launched on 1 January 2010. Toll applies to all vehicles over 3.5 t. The Slovak toll system covers 2400 km of roads. Toll rates vary depending on the type of road. Revenues from the sticker and any other toll charges are devoted to developing the network of motorways and expressways.

Moreover, the Slovak Republic, a member of the European Union may draw funds for the development of the road infrastructure from the European funds (ISPA, Phare, ERDF, Cohesion Fund). EU funds are primarily used to finance the construction of motorways.

Domestic or foreign loans with a government guarantee may be used to finance the road infrastructure. Loans are used to finance all types of roads.

The partnership between public and private sector, the so called Public-Private Partnership (PPP) is one of the latest options of financing the construction of roads. In PPP projects, public and private organizations form a partnership in order to build infrastructure and provide services

commonly provided by the public administration sector. PPP is a way to overcome the lack of funding from the state budget and limited EU resources. (Koišová, 2009, p. 115) Slovakia applied this method of financing used only once, i.e. for the construction of R1 expressways in the following sections (length of 51,53 km in total): Nitra (west) – Selenec, Selenec – Beladice, Beladice – Tekovské Nemce, northern bypass of Banská Bystrica.

In practice, various combinations of above mentioned options are used to finance the road infrastructure, depending on the type and significance of roads, as well as the financial capability of the road owners.

The road infrastructure and foreign investments – factors of economic growth and competitiveness

In the preceding sections, the road infrastructure was dealt with in depth for it is an important prerequisite for the development of economic growth and competitiveness. In this section of the paper, the road infrastructure, FDI, economic growth and competitiveness will be correlated.

The road infrastructure and economic growth in the SR

Economic growth is a synthetic macroeconomic indicator comprising an integrated effect of several factors which act on its development in a synergic manner. In this paper, we analysed the GDP growth from 2000 to 2011. In the course of monitoring the development, we took into consideration constant and current prices as well as economic growth rate. The tabulated data (Table 3) and Figure 2 visually show that the expenditures on the road infrastructure trace the GDP development with a certain delay. Both investigated indicators were markedly affected by the global economic crisis and its most striking effect on GDP was in 2009 when the rate of economic growth was negative: – 4.9%. The expenditures on the road infrastructure were the lowest in 2010, the decrease compared to the previous year amounts up to 39.48%. It was caused by the structure of the road infrastructure financing options because all its components were severely hit by the economic crisis. The state budget is one of the principal sources and its revenues and expenditures were strongly affected by the global financial crisis. In 2008, the expenditures on the road infrastructure amounted to EURO 755.1 million in current prices and to EURO 854.0 million in current prices in 2009. The fastest rate of GDP growth was in 2007 (10.5%), compare the following table and figure.

Table 3. GDP development (in milliard EURO), rate of growth

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
GDP, current prices	31,18	33,88	36,81	40,61	45,16	49,31	55,00	61,45	66,84	62,79	65,87	69,11
GDP, constant prices 2005	38,81	40,16	42,01	44,01	46,24	49,31	53,43	59,04	62,43	59,35	61,95	63,95
rate of growth %	1,4	3,5	4,6	4,8	5,1	6,7	8,3	10,5	5,8	-4,9	4,4	3,2

Source: Statistical Office of the SR



Figure 2. Expenditures on the road infrastructure and the rate of economic growth

Source: compiled by authors

The graph shows that the expenditures on the road infrastructure copy the development of the economic growth with some delay, which is due to the fact that the major source of investment is the state budget.

Foreign direct investments and the Slovak economic growth

Foreign direct investment is the category of international investment made by an entity resident in one economy (direct investor) to acquire a lasting interest in an enterprise operating in another economy (direct investment enterprise). The lasting interest is deemed to exist if the direct investor acquires at least 10% of the voting power of the direct investment enterprise.

The influx of FDI into economy depends on an array of factors. One of the most important one is a well-built road infrastructure which becomes one of the evaluative criteria when making a decision on the investment location. In the Slovak Republic, the major FDI influx is into regions having a well-built road infrastructure (Bratislava region, Trnava region, Žilina region). Foreign investors have a major effect on the Slovak economic performance both nationally and regionally. Moreover, they markedly affect the Slovak export performance which is one of the displays of competitiveness. The Slovak economy is a small open economy dependent on foreign demand. Habánik (2011, p. 233) observes that an open economy is affected by an array of processes and flows through balance of trade which redistributes national and foreign savings, thus redistributing the national income and wealth of the economy.

The influx of foreign direct investments to Slovakia is illustrated in the Table 4 and Figure 4.

Table 4. Influx of foreign direct investments to SR (in million EURO)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
FDI in mil. EURO	2088,6	1768,3	4396,8	1914,4	2441,1	1951,9	3741,4	2617,6	3199,5	-4,4	1336,2	845,9
FDI rate of growth in %	--	- 15,3	148,6	-56,46	27,51	20,04	91,68	30,03	22,23	-100,13	132,74	-36,69

Source: National Bank of Slovakia

It is evident that the largest FDI influx was in 2002 and 2006. In 2002, the high FDI amount can be ascribed to the bank sector privation and arrival of the Samsung Company to Slovakia.

In 2006, the highest inflow into equity capital (after abstracting from reinvested earnings and other capital) was made by Italy which amounted to 49.4% of total FDI inflows in the form of equity participation. Its considerable proportion was the means of Enel S.p.A. (Italian company) from completed privatization of 66% of shares of the Slovak Electric Power Plant. Next, the Korean company KIA – the major foreign investor and currently the second largest automaker in the Slovak Republic opened its plant in the SR.

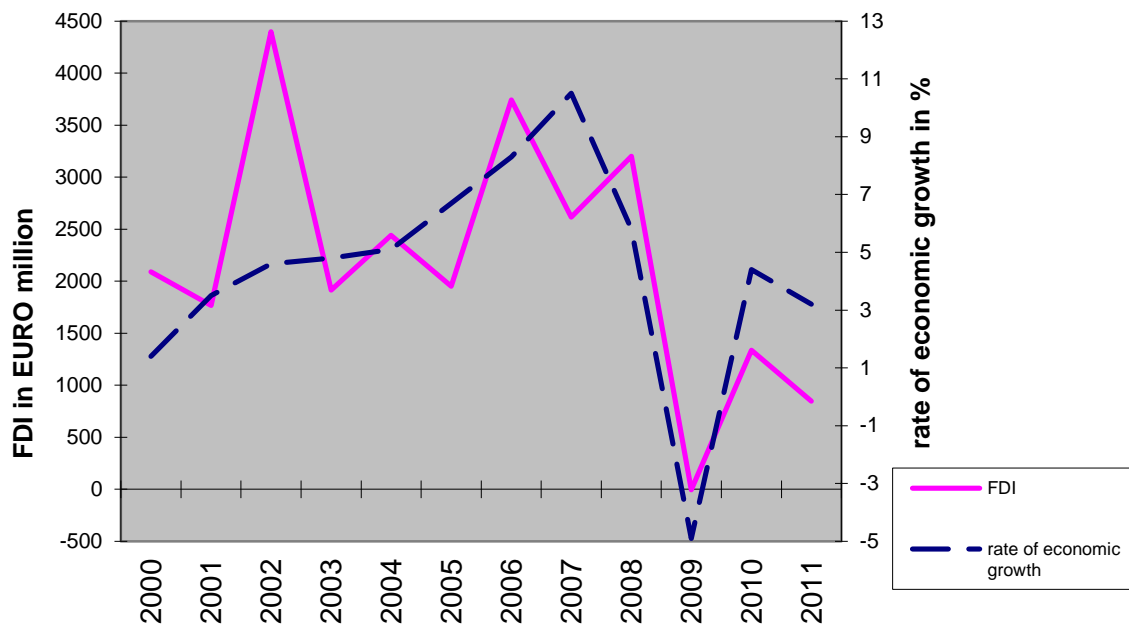


Figure 3. Comparison of FDI and rate of economic growth

Source: compiled by authors

The inflow of FDIs into the Slovak economy is affected by the quality of the business environment made up of a number of factors, such as tax policy, employment policy; however the most important is the policy supporting foreign investors through investment incentives. From 2002 to 2010, the investment incentives provided by the SR amounted to EURO 1.1 milliard. Direct financial aid was the most common form of support which amounted to € 481.7 million, followed by tax relief in the amount of € 434.2 mil. These funds were used to support 101 investment projects. More recently, eligibility criteria for investment incentives to foreign investors are linked to the number of jobs created and the produced value added by the investment for the Slovak economy.

A correlation analysis was used to investigate the interdependence of indicators. The following correlation table shows the dependence relation between variables investigated.

Table 5. Correlation matrix between variables investigated

Variable	Expenditures on the road infrastructure	GDP in constant prices	FDI (in million EURO)
Expenditures on road infrastructure	r = 1,00	r = 0,87	r = - 0,30
GDP in constant prices	r = 0,87	r = 1,00	r = - 0,31
FDI (in million EURO)	r = - 0,30	r = - 0,30	r = 1,00

Source: compiled by authors

The correlation analysis shows that a strong dependence exists between the expenditures on the road infrastructure and GDP – the dependence coefficient is $r = 0.87$. The correlation matrix shows there is a negative correlation between the FDI influx and GDP – the correlation coefficient is $r = -0.31$ which means that the GDP formation is, in addition to FDIs, influenced by several other economic growth-related factors.

The correlation between expenditures on the road infrastructure and FDI influx is negative, the correlation coefficient is $r = -0.30$. It follows that foreign investors are motivated by other factors, such as for example investment incentives.

We used a regression analysis to find the equation of the regression line. Figure 4 displays visually the regression line.

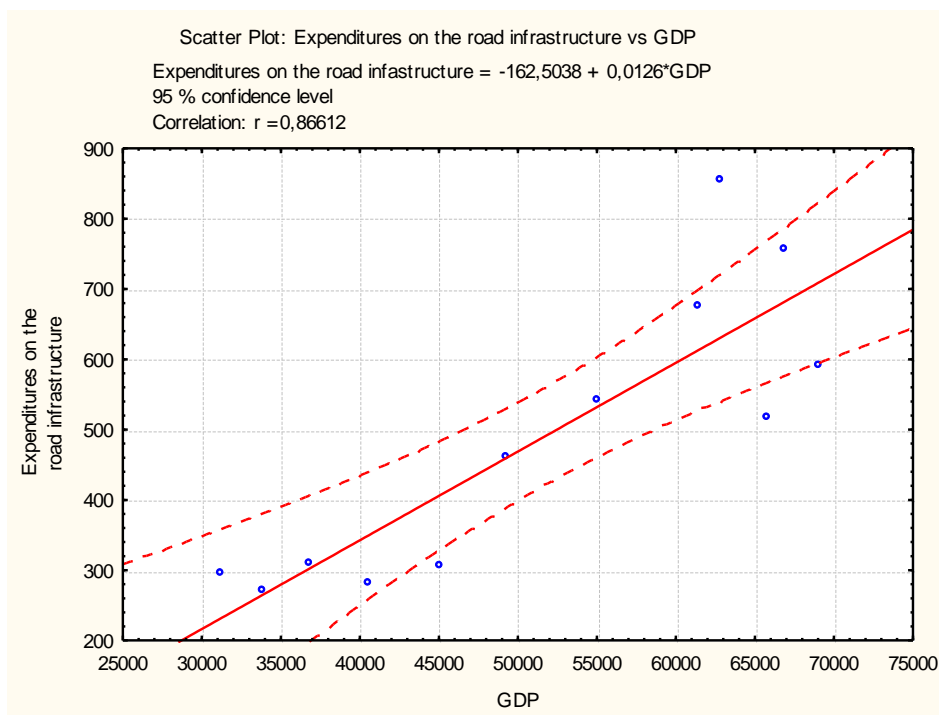


Figure 4. Regression line, expenditures on the road infrastructure and GDP

Source: compiled by authors

The regression function indicates that GDP increase by one euro makes the road infrastructure expenditures increase by 0.0126 euro on average.

Competitiveness of the Slovak economy

There is no conclusive and shared definition of the notion of competitiveness, and several approaches to competitiveness have been put forward in academic literature.

Porter (1994) observes that national competitiveness investigates the ability of national economy growth by a set of factors, policies and institutions that determine the level of productivity of a country.

The World Economic Forum (WEF) defines national competitiveness as the ability of national economy to increase continually the standard of living and quality of life. (www.weforum.org).

The World Competitiveness Centre defines competitiveness as a process in which countries and companies use the resources available to achieve prosperity and gain profit. (www.imd.org).

Kordoš (2011) observes that competitiveness is often perceived as the export performance of the country. Such an understanding may not be applicable to every country because major economies, such as for instance the USA, have a sufficiently large domestic market; therefore they are less open and less dependent on export, which is a complete opposite of Slovakia.

WEF annually assesses and releases information on global competitiveness in the Global Competitiveness Index (GCI). The global competitiveness index is a comprehensive assessment of countries' economic competitiveness which provides a weighted average of over 90 different variables, out of which 23 are statistical and 67 are identified by respondents (soft data) and numerous other factors that directly or indirectly affect the competitiveness of the state. The Global Competitiveness Index covers 142 major and emerging economies.

In addition, the International Institute for Management Development (IMD) measures competitiveness of 60 national economies on the basis of more than 300 criteria. The World Competitiveness Index measures the competitiveness of nations by analysing how they create a competitive business environment. That is why the rankings elaborated by both organizations are not identical.

There are several factors which affect competitiveness, which are included in the twelve pillars of competitiveness. The pillars of competitiveness, as reported World Economic Forum in The Global Competitiveness Report are: 1. Institutions, 2. Infrastructure, 3. Macroeconomic environment, 4. Health and primary education, 5. Higher education and training, 6. Goods market efficiency, 7. Labor market efficiency, 8. Financial market development, 9. Technological readiness, 10. Market size, 11. Business sophistication, 12. Innovation. The pillars with their multiplier effects form the national productivity, which Porter considers to be a fundamental criterion of competitiveness.

The article addresses two factors, i.e. the road infrastructure (pillar No. 2) and foreign direct investments (FDIs) (pillars No. 11 and 12). The road infrastructure is a factor which indirectly affects the inflow of FDIs into economy and, in turn, FDIs affect the national productivity.

Table 6 presents the global competitiveness ranking compiled by the WEF.

Table 6. Slovakia in global competitiveness ranking

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Position	39	40	49	43	43	41	37	41	46	47	60	69	71
Change	+7	-2	-9	+6	0	+2	+4	-4	-5	-1	-13	-9	-2
Score	-	4,36	4,02	4,23	4,43	4,31	4,55	4,45	4,40	4,31	4,25	4,19	4,14
The biggest score	USA	FIN	USA	FIN	FIN	FIN	SUI	USA	USA	SUI	SUI	SUI	SUI
	-	6,03	5,93	6,01	5,94	5,94	5,81	5,67	5,74	5,60	5,63	5,74	5,72

Source: <http://www3.weforum.org>

It follows from the data listed in the table that the competitiveness of the Slovak economy has a downward tendency, even at the period of the highest rate of economic growth (2007) which paradoxical. Another contradiction is brought by the year 2009, when competitiveness dropped again, despite the Slovak economy moved to the innovation-driven stage. This can be attributed to the sub-index of innovation and sophistication factors weight change in the GCI. The largest drop in GCI ranking was in 2010 (by approximately 13 notches) as well as in following years. The plunge was caused primarily by the following indicators: business sophistication, innovation performance decrease, macroeconomic stability (drop by approximately 24 notches), labour market efficiency (drop by 19 notches) and persistent negative development of the quality of institutional environment assessed in terms of law enforcement, frequent cronyism, lack of transparency in public procurement in this area which rank the SR the tenth to the last among countries assessed. Slovakia achieved relatively good results in terms of indicators, such as the development in financial markets and the quality of human resources. Indicators, which rank the SR so low, do not establish a good business environment neither for domestic nor foreign investors.

In terms of enhancing the Slovak competitiveness ability, it is needed to improve the business and institutional environment, notably the legal system. The economic growth potential must be founded on knowledge and innovations as stipulated in Europe 2020 strategy. The expenditure on research and development have been very low for a prolonged period of time, the figure stands at 0.46% of GDP.

The current Slovak government set themselves the objective of increasing the expenditure to 0.9-1.1% of GDP.

4. Discussion

Having analysed the selected indicators of the Slovak economic development, the following conclusions can be drawn.

We found that there was a gradual increase in the road communication length in 2000 – 2011 in Slovakia. The motorway and motorway feeder length has increased by 134.6 km and the expressway length has increased by 215.3 km since 2000. However, the length of motorways and expressways is still insufficient.

The amount of funds spent on building and refurbishing the road infrastructure fluctuated until 2005, and grew till 2009. However, the positive trend was affected by the recession. Future perspectives and options for the road infrastructure development in the SR will depend on the state budget of SR and EU budget in the next programming period.

A correlation analysis was used to investigate the interdependence rate of these indicators: expenditures on road infrastructure, GDP and foreign direct investments. The correlation analysis shows that a strong dependence exists between the expenditures on the road infrastructure and GDP.

A well-developed road infrastructure and FDI inflows affect the competitiveness of the economy. We found that the competitiveness of the Slovak economy has a downward tendency, even at the period of the highest rate of economic growth (2007) which is paradoxical.

In order to make Slovakia more accessible in terms of the European road network and transit traffic, it is absolutely necessary to complete building of the major motorway and expressway network in the shortest time possible. It is, however, required to maintain, refurbish and mend all types of roads to keep them in the quality requested. In order to connect the western and eastern parts of Slovakia and reduce regional disparities, the completion of building the motorway network is vital.

Investment incentives should be granted to those foreign investors who would bring higher value-added investments, new vacancies, sophisticated innovations and who would contribute to the optimization of the branch structure of the economy since the Slovak industry is mono-structural (car production). Foreign direct investments should strengthen the sector of small- and medium-sized enterprises and start new forms of cooperation in the sector, such as for instance in the form of clusters. According to Havierniková and Igazová (2012, p. 57), active cluster initiatives have a positive impact on creating competitive advantages, growth of employment and overall economic growth as they form an optimum base for the cooperation of domestic enterprises and foreign investors.

The following facts are of primary importance for the Slovak competitiveness to grow:

Slovakia is an open market economy depending on import and export, which affects its economic growth.

Slovak economy is strongly penetrated with foreign capital and there is a strong dependence on FDI.

Road infrastructure is a prerequisite for both the FDI inflow and economic growth.

References

- Bujňáková, M. (2009). Priame zahraničné investície v SR a v EÚ v období prepuknutia hospodárskej krízy - teritoriálne hľadisko. *Zborník vedeckých prác katedry ekonómie a ekonomiky ANNO 2009*. Prešov: Prešovská univerzita. Retrieved from: http://www.pulib.sk/elpub2/FM/Kotulic10/pdf_doc/3.pdf
- Dudáš, T. (2006). Priame zahraničné investície vo svetovom hospodárstve. Bratislava: EKONÓM. ISBN 80-225-2139-6.
- Habánik, J. (2011). Makroekonomické vzťahy v otvorenom hospodárstve. In: Habánik a kol.: *Makroekonómia*. Trenčín: FSEV TnUAD. ISBN 978-80-8075-509-6.
- Havierniková, K, Igazová, M. (2012). The role of clusters in Slovak regions. *ERENET PROFIL*. Vol. VII, No. 2. ISSN 1789-624X.
- Hošoff, B. – Hvozdíková, V. (2009). Analýza konkurencieschopnosti krajín V4 z pohľadu atraktivity pre

- PZI. Bratislava: EÚ SAV. ISSN 1337-5598. Retrieved from:
<http://ekonom.sav.sk/uploads/journals/WP21.pdf>
- Hvozdíková, V. (2009). *Národná konkurencieschopnosť – mýtus alebo realita?* Retrieved from:
<http://ekonom.sav.sk/uploads/projects/Hvozd01.pdf>
- Innovation Union Scoreboard*. (2011). Retrieved from:
http://ec.europa.eu/enterprise/policies/innovation/files/ius-2011_en.pdf
- Inovačná politika na roky 2011-2013 v pôsobnosti Ministerstva hospodárstva SR*. Retrieved from:
<http://www.economy.gov.sk>
- Janský, B. (2011). Výkonnosť ekonomiky a ekonomický rast. In: Habánik, J. a kol.: *Makroekonómia*. Trenčín: FSEV TnUAD. ISBN 978-80-8075-509-6
- Koišová, E. (2009). *Podnikové financie*. Trenčín: TnUAD. ISBN 978-80-8075-422-8
- Kordoš, M. (2011). Konkurencieschopnosť ekonomík v rámci systému svetového hospodárstva. *Nezamestnanosť a kriminalita*. Trenčín: TnUAD. ISBN 978-80-8075-472-3
- Masárová, J. (2010). *Možnosti získavania zdrojov na financovanie cestnej infraštruktúry*. Dizertačná práca. Žilina: FPEDAS ŽU.
- Morvay, K. a kol. (2011). *Economic development of Slovakia in 2010 and Outlook up to 2012*. Bratislava: EÚ SAV. ISBN 987-80-7144-184-7
- Národný program reforiem Slovenskej republiky 2012*. Retrieved from:
http://www.finance.gov.sk/Components/CategoryDocuments/s_LoadDocument.aspx?categoryId=8046&documentId=7359
- Pigman, G. (2007). *Global Institutions: The World Economic Forum – A multi-stakeholder approach to global governance*. Oxford: Routledge. ISBN 978-0-415-70203-4
- Competitiveness and innovation framework programme* (2013). Retrieved from:
http://ec.europa.eu/cip/index_en.htm
- Porter, M. (1994). *Konkurenční strategie*. Praha: Victoria Publishing. ISBN 80-85605-11-2
- Porter, M. (1995). *Konkurenční výhoda*. Praha: Victoria Publishing. ISBN 80-85605-12-0
- Šíkula, M. (2010). *Strategy of Development of Slovak Society*. Bratislava: VEDA, SAV Publishing. ISBN 978-80-224-1151-6
- ŠTATISTICKÝ ÚRAD SR. (2012). *Inovačná aktivita podnikov v Slovenskej republike 2006-2008*. Retrieved from: <http://portal.statistics.sk/files/inovacna-aktivita-podnikov-sr-2006-8.pdf>
- Tiruneh, M. W. (2011). *Výzvy slovenskej ekonomiky z hľadiska jej konkurencieschopnosti. Determinanty ekonomického rastu a konkurencieschopnosti*. Bratislava: EÚ SAV. ISBN 978-80-7144-187-8
- World Economic Forum. (2012). *The global competitiveness report 2012-2013*. Retrieved from:
http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2012-13.pdf
- World Economic Forum. (2011). *The global competitiveness report 2011-2012*. Retrieved from:
http://www3.weforum.org/docs/WEF_GCR_Report_2011-12.pdf
- European Commission - Eurostat. Available at: <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/>
- Institute for Management Development IMD. Available at: <http://www.imd.org>
- Slovenská správa ciest. Available at: <http://www.ssc.sk>
- Ministerstvo dopravy, výstavby a regionálneho rozvoja SR. Retrieved from:
<http://www.telecom.gov.sk/index/index.php>
- Štatistický úrad SR. Available at: <http://portal.statistics.sk/showdoc.do?docid=4>
- The Organisation for Economic Co-operation and Development (OECD). Available at: <http://www.oecd.org>
- Slovenská agentúra pre rozvoj investícií a obchodu (SARIO). Available at: <http://www.sario.sk>
- Národná banka slovenska. Available at: <http://www.nbs.sk>