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SERBIA AND THE CZECH REPUBLIC – COMPARISON OF RAILWAY INFRASTRUCTURE

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Abstract:

The railway infrastructure is closely connected with economic development. The degree of its influence on a country's economy is interrelated to its condition. The article analyses a situation in two post-Communist countries: Serbia and the Czech Republic in comparison with a number of selected European countries. The investments into the railway infrastructure are substantially subject to governmental activities as private investments are close to non-existent in the post-communist countries. The EU recognises the importance of the railway infrastructure and allocates subsidies by the way of structural funds into the construction of TEN-T network as well as into the reconstruction of the regional tracks. In the Balkan states, however, this role is adopted by the Russian Federation and newly by China; both the countries have realised the strategic position of the Balkan states in Europe while strengthening their role in this region. The countries of the former Eastern Block face a massive decline in the use of the railway, especially in passenger transportation. While the situation has been slowly improving in the Czech Republic, Serbia has been fighting a huge drop of interest in the railway since the beginning of the 1990s, which was mainly caused by its poor condition.

The article points out the consequences that have arisen due to underestimated investments into the railway infrastructure in recent years deriving from the economic development of these economies. It highlights the necessity to consider the investment into the railway infrastructure from a long-term perspective and analyses the consequences of infrastructure destruction or sudden investment failures that have an immediate negative impact on the economy of the whole country.

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Keywords:

Railway infrastructure, Transport, Investment, Economy, GDP

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Introduction

Serbia and the Czech Republic are post-Communist countries that embarked onto the journey to freedom and democracy at the dawn of the 90s of the 20th century. Whereas the split of the original Czechoslovakia had barely any consequences, the years-long conflict between the countries of the former Yugoslavia deeply damaged the region's economy. In 2004 the Czech Republic entered the EU; in 2000 Serbia was recovering from the devastating NATO air-raids that had ruined its infrastructure. This article understands the condition of the railway infrastructure to be an indicator of the economic development. As shown further on, a positive influence of the well-developed railway infrastructure on a country's economy has already been proven. The Czech Republic seeks the sources of infrastructure development mainly in the EU funds, whereas Serbia utilizes the EU funds as well as Russian, Chinese or Near Eastern sources. The eagerness of these subjects to invest in an infrastructure outside their area shows their extraordinary influence on the development of the whole region.

Based on complex analyses, the article strives to answer the question whether high financial investments into railway infrastructure are justifiable, and whether the dilapidated condition of the infrastructure can have a negative impact on its utilization.

1. Methodology Approach and Methods Used

The article employs a comparative method using benchmarking. The deductive approach and descriptive data statistics has been exploited which creates the basis for the conclusions.

2. The Role of Investments in an Economy

Investments represent a very important factor in the development of any economy. Investments mainly play two roles. Firstly, they form a considerable and instable constituent of the government aggregate spending, thus influencing the overall demand in an economy, and consequently having impact on employment and the income of economic entities. Economists designate this process as having revenue-creating or demand-creating effects. Secondly, investments lead to capital accumulation, to the increase of fixed capital, which positively influences the growth of a country's potential product, i.e. long-term economic growth. This process is also seen as creating capacities, see also Polách et. all (2012). The investment activity, i.e. the rate of investment is mainly influenced by the monetary policy of the central bank; however, it is also subject to the legislative environment, government guarantees for loans, the subsidy policy and source availability.

The best way of funding large-scale construction projects is a serious economic and political question. Deficit funding of investments is a possibility that has long been a topic of discussions led by economists as well as politicians. Long-term deficit funding of investments leads to the growth of the national debt. The national debt as an accumulated deficit of the national budget can be seen as one of the most topical economic and political issues.

2.1 The Czech Republic

The EU fiscal convergence criteria require the budget-deficit share not to exceed 3% of GDP and the national-debt share to remain under 60% of GDP. From this standpoint the ratio of the Czech national debt in relation to GDP, which was 43.5% in 2012 according to the Czech Statistical Office (CZSO), would not be perceived dramatically, nevertheless it has grown considerably in recent 20 years. In 1995, its share was 10.1%. In 2012 the absolute value of the Czech national debt reached CZK 1,667.6 billion, however in 1995 it was CZK 154.4 billion. In the course of recent 18 years the national debt has increased more than ten times. The budget deficit in relation to GDP rose to 4.4% in 2012 as compared to 3.3% in 2011. It is also necessary to point out that according to Eurostat the Eurozone states had an average budget deficit of 3.7% of GDP and an average national debt of 90.6% in 2012. The rate of the Czech national deficit is not as serious a trouble as the pace of indebting. Moreover, indebting has not contributed to the economy and investment start-up that would ensure the economic return and new jobs.

The value of GDP itself grows annually in constant prices as well as in common prices. The GDP value in constant prices was CZK 1,533.7 billion in 1995, in 2012 the GDP value in

common prices was CZK 3,830.5 billion. In the last 18 years it has grown two and a half times although the national debt has grown ten times. This trend can hardly be considered positive. The Noble Prize winner, James M. Buchanan (2009) says: "By a sustainable public debt we understand such a rate of debt that is not prone to uncontrollable growth. The rate of the national debt must not hinder the implementation of the more productive private investment and restrain the economy's growth potential."

2.2 Serbia

The government's influence on the country's economy has gradually been decreasing, which is accompanied by slow and frequently unsuccessful privatization, restructuring and transformation of important enterprises or whole branches. Because of the efforts to preserve social cohesion many a reform act has not been implemented yet. "Serbian industry, following a decade long devastation, is only half way through to catching up with the 1990s. Transitional cumulative growth of industry during the period 2000-2007 is among the lowest compared to other transition economies (Poland 84%, Bulgaria 76%, Slovakia 61%, Romania 41%, B&H 81%, Hungary 55%, and Croatia 40%)." Jakopin, Bajec (2009)

According to the National Bank of Serbia (2013) the basic macroeconomic issues are still determined by a high unemployment rate that oscillates between 21% and 26%, as claimed by various sources, and by a chronic national budget deficit leading to the national debt growth. On the other hand, inflation and the trade-balance deficit have significantly been decreasing. The rate of the national debt in relation to GDP was 64.4% in 2013. Like the Czech Republic, Serbia has seen its dramatic growth of 24% since the year 2006. The value of GDP has similarly been growing in Serbia, the absolute numbers of EUR 23,305 billion in 2006 have increased to EUR 31,629 billion in 2013. However, the real growth of GDP was 5.2% in 2006, whereas it reached 2.4% in 2013. The drop may be ascribed to the economic crisis, as GDP dropped as low as -3.5% in 2009 Business Info (2014)

2.3 Transport and its Significance for the Region's Development

The significance of transportation and transportation investments has always been indisputable for any economy. In 2010, the share of transport, trade and telecommunications in the total GDP amounted to 21%, whereas the share of all European countries including Turkey reached an even higher percentage, i.e. 23% EUROSTAT, (2014).

To meet the needs of the society, transport should fulfil several functions with the dominant function being the transfer of goods and people, which in turn is fundamental for the mobility of workforce. The mobility in the labour market contributes to economic growth. The stimulation function in economy is performed by investments into transport infrastructure that initiate recovery in economy and facilitate labour market flexibility, including social-stabilizing, substituting and complementary functions Eisler, Kunst, Orava (2011). In any country, transportation as such is a very important branch of its economy that can significantly influence the quality of the life of its citizens. "The academic and political circles share a general consensus that public investment into infrastructure plays a fundamental role as the economy's engine." Pereira, Andraz (2012). According to Vickerman (2008), infrastructure is the ground for economic development. For example, Alfonso (2007) implies that an investment of 100 million in a city railway transit project generates the growth by 263 million in GDP, and numbers in vacancies increase up to 8,000. The direct effect can be seen in branches related to construction, e.g. civil engineering, architecture, design, electronics and metallurgy. "An indirect effect is evident in fields like the real estate market, environment preservation, tourism, etc." Alfonso, (2007). "The influence of transport infrastructure seems to be much stronger in the long-term perspective than in short or medium-term ones" Melo, Graham, Brage-Ardao, (2013). According to Cervero (2009), the transport infrastructure is important for the successful competitiveness of cities and regions in the global market. Furthermore he adds that from the historical point of view the transport infrastructure was designed primarily to enhance mobility, including labour access and production capacity Cervero, (2009). The synergy effects accompanying the development of the railway infrastructure (here meant urban) is pointed to by Huang Chang-fua and Xia Yuan (2011) who understand the development of the railway

transport as having a long-term effect that will show positively in other strata of life in cities with a particular focus on “Green GDP”, thus supporting the role of railway in sustainable development.

3 The Role of Transportation in the Economies of European Countries

European countries are typical for their high portion of administrative expenditure. The role of the state in financing the railway infrastructure is obvious, it may rise up to 100%. Nevertheless, the share of investments into the railway system in GDP is relatively small. In the 22 monitored European countries the total amount of investments into the railway infrastructure reached EUR 24.3 billion. The share in the total GDP takes only 0.21% on average. Such a negative indicator stems from the fact that the overview does not include countries with a traditionally high share of investments like Sweden and Denmark. On the contrary, candidate countries where the subsidies to the railway infrastructure are very low are included UIC, (2012). Lithuania performed the largest railway investments in relation to GDP, i.e. 0.64% GDP, followed by Spain with 0.55% on second place. The group of four states, Slovakia, Switzerland, Estonia and Great Britain oscillate between the values of 0.34 – 0.31%. Finland, the Czech Republic and Germany move from 0.26% down to 0.21%. Although, the long-term average in the Czech Republic is much higher, see Chart 2. In other states the value falls under 0.1%. “Despite these relatively low indicators, the transport development sets conditions for the development of other economic areas hand in hand with the social and economic development of a country. A prognosis of the economic development in a certain country has to incorporate direct as well as indirect influence of the railway system.” Lingaitis, Sinkevičius, (2013). This is one of the reasons why EU administrations are the prevailing investors in the transport infrastructure. In general, the share of the administration of various European states in the total expenditure has been increasing during the last three years. According to Eurostat, in 2003 the average share was 44.3%, while in 2013 it was already 47%. EU states were oscillating between 46.1% and 51.2% during the monitored period, which may be ascribed to the economic crisis. A growth was recorded in the years 2009-2012. The year 2013 shows a slight decline in the indicator. The states that had the share in expenditure 50% or higher were Sweden, Denmark, France, Austria, Belgium, Finland and the Czech Republic in 2003. However, by the year 2013 the states having a share over 50% had changed, listing Slovenia, Greece, Finland, Denmark, France, Belgium, Sweden, Austria, Italy and Hungary. The number of states had grown, the traditional E15 countries with a high share in government expenditure had remained, and the scope had been expanded by the crisis-stricken Greece, Italy and two other countries that joined the EU in 2004. The data reveal a clear reaction of the states to the crisis within one year. Whereas in 2008 the average share of the expenditure was 44.7%, in 2009 it rose to 48.51% Eurostat, (2014). Unfortunately, Serbia has not published the data concerned.

3.1 The Czech Republic

The development in the construction sector has an extraordinary impact on the economy of the whole of the Czech Republic. According to the data issued by the CZSO, the construction sector contributed 7.6% to GDP and 8.3% to employment in 2012. In an effective economy, construction is a crucial economic agent in economic stability. In the Czech Republic, the context of real economic indicators has shown its depression in recent years. In the case of an unexpected failure of the government investment the economy is obviously unable to tackle the problem itself. The fact that the role of the government in constructing the infrastructure is elementary was proven by the CZSO data, which reveal the share of the private sector only spanning 20-30% share. This is insufficient to saturate the whole market if the government investments fail. The biggest investor of civil engineering works is the public sector that covers 73% of all such works. Since the year 1997 this share has hardly changed. A drop in the means invested in the transport infrastructure has equally brought about the drop in the vacancies in

the sector. According to the CZSO (2013) the average number of registered employees in construction was 258.3 thousand in 2010. The third quarter of 2013 saw a drop of the number to 220.9 thousand, which constitutes 14.4%. Accordingly, it is reflected in the construction productivity index of civil engineering works that dropped to 81% in 2012, as compared to 2009.

Ill-considered economising on the government expenditure may have a very negative impact on a certain branch and may deepen the crisis of the whole sector by the inability to absorb the EU funds. During the years of the economic crisis, this was exactly the case of the Czech Republic in 2010 as it decreased the investment into the transport infrastructure from CZK 82 billion in 2008 to CZK 33 billion in 2012. Logically, a dramatic drop of the transport infrastructure share in GDP followed, i.e. from 2.16% in 2009 to 0.87% in 2012. “It is obvious that if governments make it impossible for their subjects to accumulate and to invest additional capital, responsibility for the formation of new capital, if there is to be any, devolves upon government.” Mises (1996, s. 842).

3.2 Serbia

The Serbian construction sector has been struggling with long-term unsolved problems. In 2013, the Serbian construction sector showed a drop of 28.9% after a decline of 7.5% in 2012. In 2013 the sector’s share of GDP was 2.7%. Investments are dominated by the state that has its investments into the repairs of road and railroad networks mediated through the Republic Road Directorate or Serbian Railways Business Info (2014). Like the Czech Republic, Serbia prefers investments into the road network to investments into the railway infrastructure. A large part of the investments into infrastructure is supported by the European Investment Bank EBRD, or by export or development credits provided mainly by China or Russia.

4. The research

To facilitate a more effective use of the railway, it has to be in an adequate state, i.e. its condition must enable reliable and comfortable transport of goods and persons. In the case that the railway has not been maintained continuously, it requires extraordinary investments in a relatively short period of time to even start fulfilling its role. The following analysis confirms the advantage of countries that have been investing in the railway continuously and have not neglected its maintenance. The influence of the investments into the railway network has again proved to show in a long-term perspective. An indicator to play a role when considering the effective use of the financial means invested into the railway infrastructure was derived from the comparison of the financial means invested into 1 km of track and the productivity indicators of tonne-kilometre (tkm) and passenger-kilometre (pkm) related to 1 km of track.

States investing most are usually also the most efficient in the monitored indicators. The most balanced development can be tracked in the case of Germany whose intensity of use is roughly the same in both passenger and freight transportation. Switzerland and Great Britain reach the best indicators in passenger transportation; However freight is not transported as much as e.g. in Germany. Concerning freight transportation, Great Britain occupies the lowest position. And Italy copies Britain’s outcomes. The Czech Republic, like Germany, utilizes railway equally for both types of transportation. Serbia, with the respect to low investment, does not show any remarkable indicators.

Chart 1: A comparison of financial means spent on 1 km of track

Country	Switzerland	Spain	United Kingdom	Germany	Italy	Finland	Latvia	Turkey	Estonia	Slovakia	Czech Republic
Invested Euro per 1 km rt 2012	466348	363202	359103	166344	160751	83445	76869	75799	70707	67053	39912
Country	Lithuania	Bosnia Herzegovina	Croatia	Portugal	Bulgaria	Romania	Hungary	France	Slovenia	Serbia	FYROM
Invested Euro per 1 km rt 2012	30228	24442	22704	16434	11659	10009	9941	3495	2152	2119	849

Source: Created on the basis of data from Eurostat, OECD and UIC by the authors.

4.1 The state of the railway infrastructure in the Czech Republic

The Czech Republic is troubled by the lack of maintenance, which is incurred, among others, by the huge density of the network in combination with low maintenance expenses. Up to 1905 more than 6,300 km of tracks had been built in the Czech lands, out of which 1000 constituted “local tracks” whose technical quality did not even then meet the requirements. Mass railway construction resulted in the insolvency of the state that had contributed to the construction. As early as 1907 the tracks were reported to lead through areas whose transport needs did not require the railway at all. The revenues of the railway could not by far cover the loan interests, not to speak of the regular maintenance, see Hlavačka, (2006).

The investments ultimately flow into the renovation of the existing tracks. As the Czech Republic operates the densest railway network in Europe, it tends to decrease the length of the tracks rather than build new ones. The whole railway construction sector in the CR is virtually dependant on the state and European Union subsidy policies as one of the major tools of financing the Czech transportation infrastructure is the Operational Programme Transportation. Private investments are nearly non-existent. Any deviations in state investment affect rapidly not only the whole transport construction sector, but also the economy of the country.

Nevertheless, regarding the necessity to boost the speed, railway curves are being straightened, new tunnels and bridges are being built. New and truly interesting infrastructure objects are being built, e.g. a new bridge over the D3 motorway in the section of Chotoviny – Sudoměřice near Tábor. The railway network in the Czech Republic provides low electrification (only 33%, mainly the northern part of the Czech Republic lacks electrification). The situation in double-tracks is even worse with their covering only one fifth of the existing network.

While the area of maintenance has not changed since 2003 as CZK 9 billion has been spent on it every year, (i.e. EUR 333 million), investments have recently recorded a steep decrease, especially at the peak of the economic crisis. This drop was partially caused by the fact that the area of construction and reconstruction of motorway and railway networks has been subject to tough criticism for its inefficiency and soaring prices. In 2010, the efforts of the Ministry of Transport (MT) to cut down the construction expenses led to a decision to stop the planning of road and railway construction paid by the state budget as well as EU funds, see Jan Sůra, (2010). It was its priority to cut the costs of construction and, based on the newly issued so-called Superstrategy, set priorities for the transport construction as there was no existing prioritization of constructions, see Supreme Audit Office, (2011). However, this decision arrived in the middle of the planning period of 2007-2013 when it could not be assumed that the European Commission would be willing to change e.g. financial allocations into individual sectors. What is more, the “Superstrategy” had not been approved by the Government, and during 2011 the MT stopped operating it, see Supreme Audit Office, (2011). In the same year, the MT launched work on another concept, and in 2013 it concluded a document called “Medium-Term Plan of Transport Infrastructure Development for the Years 2014-2020 (Transport Sector Strategy, 2nd phase)” that aims at setting the concept of priorities and the sequence of infrastructure investments, that was to be presented for approval to the

Government in October 2013, see Supreme Audit Office, (2012). In June 2013, the Government approved the Transport Policy in the Czech Republic for 2014-2020 with the outlook to the year 2050.

The discontinuation of planning and transport construction lasted roughly 9 months and negatively affected the whole transport construction sector including state organizations coordinating construction assignments, i.e. the Road and Motorway Directorate (RMD) and Railway Infrastructure Administration (RIA). RIA discontinued 31 constructions, RMD discontinued 15.

Chart 2. The amount of financial means invested into the railway infrastructure and its share in the GDP in mil CZK

Type of expenditure mill CZK	2010	2011	2012	2013	2014	2015	2016	2017	2018
Railway infrastructure investment expenditure	14 245	10 987	9 594	8 697	12 787	31 785	18 424	14 891	19 003
Railway infrastructure maintenance expenditure	9 083	8 963	8 877	9 812	11 665	18 038	15 596	14 422	17 210
Railway infrastructure expenditure total	23 328	19 950	18 472	18 509	24 453	49 823	34 020	29 313	36 214
GDP in Czech Republic	3 667 619	3 807 228	3 843 911	3 913 361	4 266 556	4 473 913	4 712 900	5 049 900	5 310 300
Quotient of total expenditure to GDP	0,64	0,52	0,48	0,47	0,57	1,11	0,72	0,58	0,68
Quotient of railway investment expenditure of GDP	0,39	0,29	0,25	0,22	0,30	0,71	0,39	0,29	0,36

Source: Transport Yearbook, (2012, 2018)

There may be a discord as to what influenced the construction development more, whether it was the global recession in economies or the intervention from the part of the ministry. The above-quoted review quite clearly reads that the biggest drop occurred in 2010 and 2011, i.e. it coincided with the discontinuation of transport planning and construction. The differences between 2010 and 2009 reaching a 76.3% drop in contracts speak clearly. The same trend may be observed in 2011 and 2012 when another factor came to play – a difficult restart of the whole process, the crisis that had affected the Czech Republic in 2012, and the ending of the programming period implying a lower volume of the disposable financial means. In 2015 we can see a huge afford to invest in +2 years in the end of 2007-2013 period.

Besides the drop in pace of eligibility of funds that both caused a drop in the construction launched and reduction in civil engineering companies' workforce, there also the workforce was made redundant by about a quarter in planning companies (mainly in the railway construction planning) that had not found means for "efficiency salary" of the designers that would keep them employed. The average redundancy reached 20%.

In the next planning period the Czech Republic presumes the aggregate investments into the development projects to reach EUR 7.295 billion, and an aggregate sum for the improvement of operations in the total of EUR 1.717 billion. The external aim of the EU's point of view is a 30%-transfer of road freight transportation longer than 300 km to other means of transportation, e.g. railway or waterways, with an outlook of 50% before the year 2050. The EU plans the completion of the main network TEN-T by the year 2030 and the global network by 2050. Consequently, the enhancement of competitiveness of the railway transportation and the completion of the European high-speed railway network are expected by 2050 along with the majority of passenger transportation being served by the railway by the same year. The last target to meet by the year 2015 is the connection of airports that are part of the main network to the railway network.

The external aim from the national point of view contains priorities as follows:

- With regard to the financial capabilities and readiness, to finish the modernization of the transit corridors by the year 2018
- To continue the modernization of all important railway nods including the connection of the corridors within the nods
- To prepare the conditions for the linking of all regions to a quality railway network
- To rationalize the operation of selected regional tracks
- To support the development of cross-border railway transportation projects where there is an assumption of strong transportation currents

- To ensure the development of regional and city rail systems including their interconnectivity and the development of public transport terminals
- To continue the preparation of a railway link to the Prague – Ruzyně Airport, see Transport Sector Strategy, 2nd phase (2013).

The situation became better during 2014-2020 period. “The overall volume of transport infrastructure expenditure increased again after two years of reduction and reached in total 49.1 billion CZK, railway infrastructure 19 bilion CZK. The increase by 15% was rather substantial and in absolute figures, it amounted to 6.3 billion CZK. The decrease in the previous year was 1.5%, but in 2016, the reduction was 24%. Even despite this very significant reduction, the invested amounts did not reach the volumes of the previous period, in particular the years 2009-2014. Over the past 17 years, the lowest amount was invested into transport infrastructure in 2013 – 27.3 billion CZK, railway 8 bilion CZK, while the highest amount was reached in 2008 when the investments amounted to almost three times more - 83 billion CZK, railway almost 23 bilion CZK this being the maximum financial volume of the past 20 years, for railway was the maximum in 2015 with 31,7 bilion CZK.” (Transport yearbook 2018)

4.2 The state of the railway infrastructure in Serbia

Due to a favourable geographical position, Serbia has always played an important role in transportation. The beginning of the Serbian railway transportation history dates back to the 19th century when the first railways were built in the framework of the Austro-Hungarian Monarchy and Ottoman Empire. The modernization and development of the Serbian railway had been intensive until the 1990s (e.g. in 1970 the service on the first electrified track of Yugoslav Railways network was launched connecting Beograd-Šid-state border (Zagreb)). The picture of the present-day Serbian railways is much different. The poor condition of its infrastructure that is largely obsolete presents serious difficulties for the future development of this significant transportation area.

The management of the public railway infrastructure, public and goods transportation and the maintenance of railway carriages are within the authority of the “Serbian Railways” Železnice Srbije (2012). In 2012, the public enterprise of Serbian Railways was transformed into a joint-stock company employing a workforce of 18 280 and whose only stockholder is the Republic of Serbia. The Serbian railway network is made of 3,809 km of built tracks out of which the electrified tracks cover 1,279 km, i.e. 1/3 of the network total, which is under the average of the EU. The impact of the long-term monopoly of Železnice Srbije on the Serbian railway system is as follows: low quality of the transportation services, excessive debts and loss by the railway enterprise management, the non-competitiveness in the transportation market and the incapability of opening the railway market to foreign operators, mainly due to the low level of infrastructure quality as compared to other European railways, Železnice Srbije, (2012).

All major tracks cross all larger cities and intersect in the zones of Belgrade and Niš. The main railway direction heads along the Pan-European Corridor X that serves the main railway transportation. There are 760 km of Serbian railway tracks in the corridor which splits into two branches: Xa (Belgrade – Budapest) and Xb (Niš – Sophia). Another important track connects Belgrade with Bar.

According to the description issued in the Strategy for the Railway, Road, Water and Air Transportation Development for the Period from 2008 to 2015 (hereinafter the Strategy), only 7% of tracks (276 km) are double-tracks. The density of the network is unbalanced and insufficient especially in the southern regions.

Serbia has been suffering from the impacts of the war at the turn of the century. The Serbian infrastructure was mostly damaged by NATO air raids during three months from March 1999 to June 1999. The railways have not recovered from the shock yet. It was a severe blow to a railway that was even then hardly matching modern standards. Regarding the average density of the Serbian railway network, new tracks are built the financing of which is shared to a large extent by the Russian Federation.

Thus the Serbian railway is typical for being under-maintained, which leads to a low utilization of its capacity. Based on the data by the Serbian Railways, only 31% of the railway capacity is employed.

Passenger comfort is also reduced by low operational speed that is only 60 kmph due to the poor conditions. And it is declining steadily, see graph 9. The permitted speed exceeds 100kmph on only 3.2% of tracks while the most part of the tracks (about 50%) allow a maximum speed under 60kmph. With the exception of some double-track and electrified sections of the tracks of Belgrade-Šid and Velika Plana-Niš that allow for a higher speed, all other tracks have to deal with obsolete technical and technological parameters. Some parts of the tracks are in such a bad condition that the speed is restricted to only 20kmph or even less. According to the Serbian Railways, the average speed of freight transportation in 2012 was 27.9kmph, passenger transportation reached 43.4kmph.

During the past 20 years, only 11% of the tracks have been repaired where the repairs were necessary. We cannot be surprised at the huge drop in carried goods and people, see below.

The insufficient investments into the basic maintenance of the railway are the consequence of the general underdevelopment in the last period, bad organization, and deficiency of financial means, social and personal policies. The plan is to return the infrastructure into the state it was in at the end of the 80s of the 19th century and to modernize another 1,000 km of arterial railways, i.e. about 57% of the main tracks, i.e. 26% of all the railways.

Therefore Serbian future plans are of a more modest character as everything derives from the government's capacity to ensure financial means for the infrastructure reconstruction. The minimum scenario reckons on EUR 26 million, the optimum scenario would require EUR 136 million. The priority is the reconstruction and modernization of tracks linked to TEN-T corridor X. If the EU does not participate in the financing of the railway network reconstruction in a more active way, the role of the main investor may be taken over by the Russian Federation and the EU will lose another area where it could have exercised its authority, the area that is the gate to the West Balkan.

The development strategy is focused and based on the decision of Serbia to join the European Union, the efforts of the transport system sustainable development and the economic stability. In this context it is important for Serbia to make use of the relative advantage as opposed to its neighbours, primarily to valorise the transit function of its geographic position. Nowadays the most important for Serbia is partnership with Russia and China. The economic cooperation between Serbia and China is particularly good in the area of infrastructure, where the value of joint projects is about €13 billion. Chinese companies help Serbia to build the first high-speed railway in this part of Europe between Belgrade and Budapest. The works will be finished by the autumn 2021 and that people will travel from Belgrade to Novi Sad within a half an hour. "Construction of the high speed railway line is the most important infrastructure project in South-Eastern Europe and the value of the construction works on the territory of the Republic of Serbia and Hungary is up to €4 billion, where almost €2 billion is for the Serbian territory," said Deputy Prime Minister of Serbia (Železnice Srbije 2019).

4.3 The Development of the Transported People in Numbers

The Czech Republic

If we take into account the trends of railway use for passenger transportation during the last 40 years, we detect huge differences between the post-communist and E15 countries. For example, the trend had hardly changed in the Czech Republic during 1970-1990, the value oscillated around 20 million pkm. After the split of Czechoslovakia, passenger transportation started to decline steeply in both the new states. The drop was obvious shortly after the coup in 1990 when the number of transported persons decreased from 19.3 million pkm to 16.8 pkm in 1992. In the Czech Republic the numbers sank from 8.5 million pkm in 1993 to 6.7 in 2011. The Slovak Republic shows a drop of nearly a half, from 4.5 million pkm in 1993 to 2.4 million

pkm in 2011. Both countries have been experiencing a slow increase in the attention of passengers in the few recent years.

Serbia

A similar tendency was shown in Serbia between 1970-1990, which had experienced a gradual rise in transported persons from 3.6 million pkm to 4.4 million pkm. In 1991, there was a steep decline to 2.6 million pkm. However, the largest drop corresponds with the war conflict; in 1999 the number of pkm fell to 0.7 million of pkm. A temporary increase occurred in 2000-2001, however the country was again affected by another drop as low as 0.5 million pkm in 2011. This trend was inflicted by the fatal condition of the railways where the average speed reaches 40 kmph at maximum and the infrastructure is deeply under-maintained. The deterioration of the railway transportation can be exemplified on the following sections of the most important tracks:

Beograd – Šid (-Zagreb), 115km

- 1989: travelling time 2 hours, 30 pairs of long-distance trains daily
- 2013: travelling time 2,5 hours, 1 pair of long-distance trains daily

Beograd – Niš, 245 km

- 1989: travelling time from 3.5 to 4 hours, 14 pairs of long-distance trains daily
- 2014: travelling time from 4 to 4.5 hours, 2 pairs of long-distance trains daily (Železnice Srbije nondated)

4.4 The Development of Freight Transportation

Regarding freight transportation, the tendency differs from passenger transportation. The advanced countries preserve a steady performance in freight transportation in 1993-2013; although Germany, Great Britain and Austria are exceptions in increasing the volume of transported goods. In the case of Germany it was 64 million tonne-km in 1993 and 110 million tonne-km in 2012, in Great Britain the freight transport grew from 13 million tonne-km to 22 million tonne-km. Other E15 states rather stagnate. In Italy the volume of the transported goods decreased slightly from 22 million tonne-km in 1996 to 20 million tonne-km in 2012. Countries of the former Eastern block show a significant decline similar to passenger transport. The Czech Republic recorded a fall from 25 million tonne-km in 1993 to 14 million tonne-km in 2013. A similar tendency can be seen in the Slovak Republic where a drop was recorded from 14 million tonne-km in 1993 to 7.5 million tonne-km in 2012. The only available data for Serbia comes from the period of 2004 – 2011, when the volume of the transported goods was constant in fact, i.e. 3.5 tonne-km. According to the information of the Serbian Railways, joint stock company, the volume of goods transported in 2010 dropped as compared to 1985 by about two thirds, see Železnice Srbije, (2014).

5. CONCLUSION

Individual European states approach the use and maintenance of the railways in a very different way. Advanced countries like Great Britain, Switzerland and Germany are able to utilize the potential of their railways to their maximum. Their investments of appropriate financial means show in the overall condition of the infrastructure. Some E15 states have started losing their privileged position in the use of the railways. It is especially France whose indicators are decreasing gradually. On the other hand, Spain is relatively successful in the increase of the quality of its infrastructure. It is interesting that the results in the area of the railway infrastructure utilization and development do not entirely comply with the overall economic results. Out of the “PIIGS states”, Italy and Spain have reached very good results. Greece comes out as the worst of all E15 states, Portugal is not doing particularly well and Ireland shows imbalanced data, too.

Post-communist countries are typical for their huge drop in the railway use for passenger as well as freight transportation with the negative impact on the amount of the finances spent on maintenance and investment. The change occurred with the joining of these states to the EU, whereby the access to the subsidies for railway modernization opened.

It is striking how fast the situation on the railway can turn to the worse, especially with regard to the use of passenger transportation. The tendency that can be seen in the post-communist countries was especially significant after the fall of the Iron Curtain. Even though the travelling comfort in some of these counties was higher at the beginning of the 1990s than it is today, e.g. in Serbia, the decrease in the passenger numbers was massive. What played an important role was the development of the society that saw a sign of prosperity mainly in the use of cars instead of public transport. It is a present-day paradox that the use of the railway in the most advanced E15 countries is a sign of ecology-conscious and timesaving behaviour. Managers prefer the possibility to work on the way, which is entirely impossible while driving. It is important for the railway to succeed in offering sufficient comfort that would outweigh the advantages provided by individual transportation. According to the research by Italian scientists, "a global comfort" consists of three basic constituents: safety, efficiency and quality, see Corriere, Di Vicenzo, (2012). It takes a very long time before the comfort has been reached and the opinion of citizens of the public transport has been swayed. What matters is not only the infrastructure condition, but also the service offered by the transportation companies. West European companies underwent the restructuring in the 80s of the 20th century. Now it is the East European countries that are restructuring. Hand in hand with the restructuring, the state transportation companies face competition that significantly erodes their once-to-be monopoly. State transportation companies are very often drawn to the bottom by property that they can no more make any use of. On the other hand, they have repair workshop background at their disposal that the new companies cannot acquire. According to recent research, higher productivity will be provided by technical progress, which has a huge importance for the railway development. It is for this reason that the research, development and modern investments are to be supported - so that the environment of deregulation and liberalization in this branch continually enhances the level of investments and technological progress, see Sànchez, Villarroya (2000).

Based on the above-stated findings it can be concluded that a stable political development as well as continuous investments and sufficient maintenance ensure a gradual increase in the persons and goods transported, whereas political instability, deviations in maintenance and stoppage of investments have a negative impact on the utilization of the railway. A return to passenger transportation is a lengthy process that only shows several years later. Nevertheless it is a steady tendency; taken from the ecological and economical point of view, it is a highly positive phenomenon. However, high prices of railway fares have to be balanced by travel comfort in both the carriage equipment as well as in the speed, reliability and connection frequency, not to mention the availability.

Passenger requirements have proved to be growing significantly as there is a larger choice of means of transport available. If the railway wants to compete with other means of transport successfully, it has to fulfil the growing requirements of its clients. Clients of the freight transportation expect promptness, high pace and reliability, which is highly complicated to meet unless tracks are well maintained. Abandoning railway transportation when trans-European corridors are being constructed and the environmental aspect is considered as crucial is a step backwards. It is necessary to maintain the infrastructure in such a condition that will fulfil the growing requirements of passengers and thus contribute to the economic growth of the country at question. Compromise solutions that do not improve the infrastructure quality are a waste of financial means. In a long-term perspective, such financial means that are capable of maintaining competitiveness have to be invested. In conclusion, this purpose justifies high investments into the railway infrastructure.

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