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The role of the transportation sector in Serbia's macroeconomic performances

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Abstract: *The transportation sector plays a significant role in the functioning of the entire economy. In the literature, the channels of the influence of transport on various economic variables are theoretically explained, and there are also many empirical verifications of the positive impact on economic growth, productivity and employment above all. The aim of this paper is to analyze the importance and role of the transportation sector in the macroeconomic framework of Serbia. The contributions of the transportation sector to the gross value added and its real growth, the structure of gross value added, investments in fixed assets, employment, average net earnings and real growth of net earnings, inflation, as well as the business results of transport companies in terms of the value of total assets, operating income and net results are analyzed. Special attention is paid to the entire transportation sector, as well as to special divisions of this sector such as land transport and transport via pipelines, water transport, air transport, warehousing and support activities for transportation and postal and courier activities. The analysis covers a five-year period from 2019 to 2023.*

Keywords: *transportation sector, macroeconomic performances, gross value added, investment, employment.*

Uloga transportnog sektora u makroekonomskim performansama Srbije

Apstrakt: *Transportni sektor ima značajnu ulogu u funkcionisanju celokupne privrede. U literaturi su teorijski objašnjeni kanali uticaja transporta na razne*

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ekonomske varijable, a takođe prisutne su i mnoge empirijske verifikacije pozitivnog uticaja na ekonomski rast, produktivnost i zaposlenost pre svega. Cilj ovog rada je da analizira značaj i ulogu transportnog sektora u makroekonomskom okviru Srbije. Analizira se doprinos transportnog sektora bruto dodatoj vrednosti i njenom realnom rastu, strukturi bruto dodate vrednosti, investicijama u fiksna sredstva, zaposlenosti, prosečnim neto zaradama i realnom rastu neto zarada, inflaciji, kao i poslovnim rezultatima transportnih kompanija u smislu vrednosti ukupne aktive, prihoda od prodaje i neto rezultata. Posebna pažnja posvećena je kako celokupnom sektoru transporta, tako i posebnim oblastima ovog sektora kao što je drumski i cevovodni transport, vodni transport, vazdušni transport, skladištenje i pomoćne delatnosti u transportu i poštanski saobraćaj. Analiza obuhvata petogodišnji period od 2019. do 2023. godine.

Ključne reči: *transportni sektor, makroekonomske performance, bruto dodata vrednost, investicije, zaposlenost*

1. Introduction

The activity of transportation plays a significant role in the functioning of the entire economy. Transportation is crucial for economic development from the supply perspective, as it affects it primarily through enabling market expansion, increased production, and creating multiplier effects. It also creates effects on production and employment during the phases of infrastructure construction and operation. On the other hand, the demand-driven perspective highlights the need for improved transport infrastructure and efficient services to drive economic development, underscoring the importance of the transportation sector for the economy (Cowie, 2010).

The transportation sector generally offers higher average earnings compared to other sectors of the economy, particularly for low and medium-skilled workers. Its comparative advantage in this regard is expected to increase in the future. Furthermore, the demand for low and medium-skilled labor is projected to increase at a faster rate than the demand for highly skilled labor within the transportation sector. This trend, coupled with an aging workforce presents a significant challenge, particularly in the air transport and water transport (Panayotis et al., 2014).

While the short-term effects of the transportation sector on employment are notable, its long-term impact is even more pronounced. Furthermore, in addition to its impact on employment, the transportation sector also has significant effects on other aspects of the economy, including economic growth, company productivity, and state income (Lavee, 2019).

Schade et al. (2015) especially emphasized the effects of investments in transport infrastructure on employment. These are direct effects, which stem from job growth in the construction industry, indirect effects, which arise from employment growth in industries that supply the construction industry, and induced effects, which result from the increased consumer spending that occurs when newly employed people spend their increased incomes.

Transport improvements, by reducing costs and increasing accessibility, directly impact transportation producers, household mobility, and demand for goods and services. These changes trigger short-term effects on employment, output, and income. Over time, dynamic economic development occurs as these improvements stimulate interconnected processes, leading to productivity gains across various sectors, regions, and geographic areas (Lakshmanan, 2007).

The transportation sector significantly influences trade. Transportation infrastructure is a key determinant of both trade costs and per capita income (Venables, 2006). Furthermore, in the EU member countries, the efficiency of port facilities and air transport infrastructure is the most significant factor in facilitating trade (Wilson et al., 2006).

Economic research has extensively explored the effects of transport infrastructure investments, yielding a wealth of theoretical and empirical findings. Investments in transport infrastructure are of significant economic importance due to the broad range of effects they generate, which was summarized by Miljković (2019). For example, they reduce travel time and transportation costs, fuel consumption, and vehicle operating costs. These improvements also enhance traffic safety, resulting in fewer accidents and lower associated costs. This leads to benefits for consumers in lower prices, for workers in higher wages, and for businesses in increased profits.

Furthermore, investments in transport infrastructure result in multiplier effects on private sector investments, spin-off effects, which develop in the three-to-four-year period after public infrastructure investments, possible crowding-out effects on private sector investments, and redistributive effects, as they change the locations of enterprises and the concentration of economic activity at the regional level.

Transport infrastructure investment particularly impact economic growth (Miljković & Petrović-Vujačić, 2016), also contributing to economic performances of European regions, by increasing regional gross value added and labor productivity (Miljković et al., 2018).

Investments in transport infrastructure have a positive impact on trade and exports (Fedderke & Garlick, 2008). This is because underdeveloped infrastructure is an obstacle to integrating into global trade flows, whereas improved infrastructure increases opportunities for the movement of goods, services, and ideas between countries. Furthermore, it reduces transport, inventory, and logistics costs, and it enhances a country's attractiveness for foreign direct investment, particularly for developing countries (Kotschwar, 2012).

The economic literature highlights the positive effects of transport infrastructure investments on tourism (Banister & Berechman, 2000), bank placements and the bond market (Walsh et al., 2011), and increased tax revenues (Wallis, 2009; Weisbrod & Reno, 2009). It also boosts competitiveness, considering that infrastructure is one of the twelve pillars of competitiveness according to the World Economic Forum's methodology (European Commission, 2014).

2. Methodology and Data

To understand the transportation sector's impact on the Serbian economy, a comprehensive analysis of several key indicators is crucial. The proposed study aims to delve into the gross value added of the transportation sector, its participation in the overall economy, and the structure of gross value added across various transportation divisions.

The analysis will focus on the following divisions of the transportation sector:

- Land transport and transport via pipelines: this category includes road transport, rail transport, and pipeline transport.
- Water transport: this sub-sector comprises inland waterway transport.
- Air transport: analysis will cover passenger and cargo air transport services.
- Warehousing and support activities for transportation: this category includes storage and logistics services.
- Postal and courier activities: this sub-sector comprises postal services, courier services, and other related activities.

Moreover, the study will examine the following labor market indicators:

- Number of employees: changes in the number of formally employed individuals in the transportation sector will be analyzed.
- Average monthly net earnings: trends in average monthly net earnings for the transportation sector as a whole and individual divisions will be evaluated.

- Growth rates of earnings in real terms: changes in real earnings for the transportation sector and its divisions will be analyzed.

The analysis will also cover the following business operations indicators:

- Total number of enterprises and entrepreneurs: Changes in the number of enterprises and entrepreneurs in the transportation sector will be examined.
- Value of total assets: Trends in the value of total assets for enterprises and entrepreneurs in the transportation sector will be evaluated.
- Value of operating income and net results: changes in operating income and net results for the transportation sector will be analyzed.
- Share of results in the total values: the share of the mentioned categories of results in the total values for the entire economy will be calculated.

The analysis will rely on data from the Statistical Office of the Republic of Serbia and the Serbian Business Registers Agency. The study period will cover five years (2019-2023), and amounts in dinars will be converted into euros according to the average exchange rate of the National Bank of Serbia for each year (Table 1).

Table 1. Dinar exchange rates against euro – period average

Year	Average exchange rate
2019	117.86
2020	117.58
2021	117.57
2022	117.46
2023	117.09

Source: National Bank of Serbia (2024)

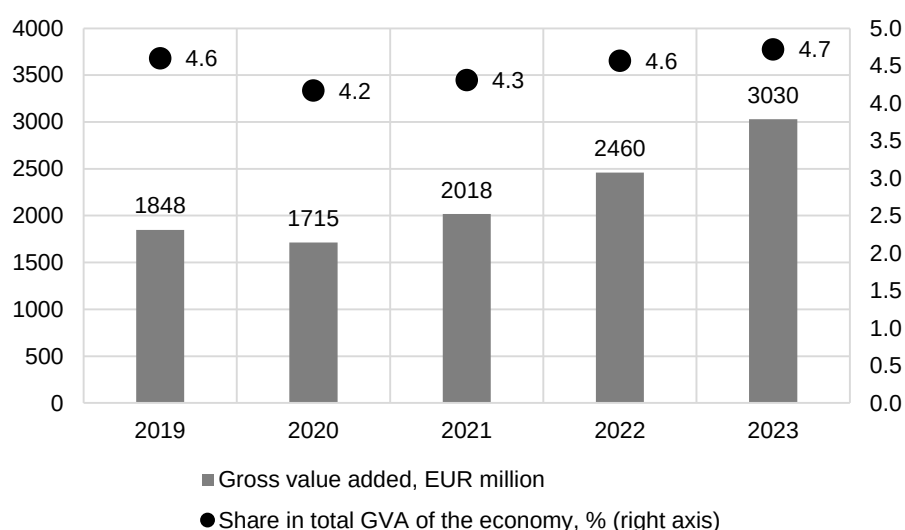
3. Results and Discussion

The transportation sector in Serbia generated a gross value added of EUR 3.03 billion in 2023. Over the preceding five years, the sector experienced a growing trend in gross value added, with the exception of 2020, which was impacted by the COVID-19 pandemic. Furthermore, the sector's contribution to the total gross value added of the Serbian economy also increased,

reaching 4.7% in 2023. The detailed breakdown of gross value added for the transportation sector is illustrated in Figure 1.

The structure of gross value added across the transportation sector's divisions remained relatively stable over the five-year period (Figure 2). Land transport and transport via pipelines consistently held the largest share, accounting for 57% of the total GVA of the transportation sector in 2023. Warehousing and other support activities for transportation followed, contributing approximately 28%. The share of postal services saw a slight decline, reaching 8% in 2023. Air transport accounted for 6% in 2023, with more significant fluctuations, particularly during the COVID-19 pandemic. Water transport consistently held the smallest share, representing 2% of the total GVA of the transportation sector.

Figure 1. Gross value added of the transportation sector in Serbia

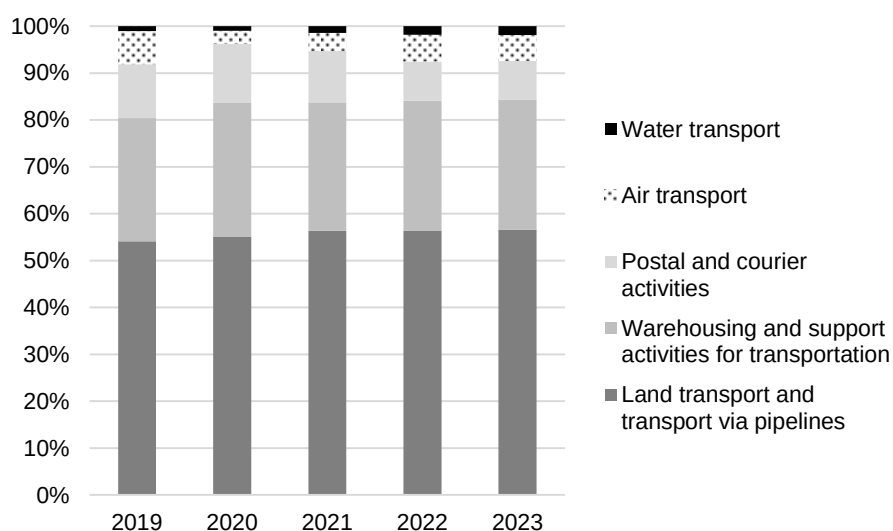


Source: Statistical Office of the Republic of Serbia (2024)

The real growth rates of the transportation sector's GVA have generally mirrored the trends of the total economy's GVA. During periods of economic expansion, the transportation sector has typically exhibited more robust growth, while during contractions, its decline has been more pronounced. For example, in 2023, the real GVA growth rate of the transportation sector was 6.9%, significantly outpacing the economy-wide growth of 4.8%. Within the transportation sector, air transport (13.6%) and water transport (10.3%) experienced the most substantial growth. These two divisions also led the

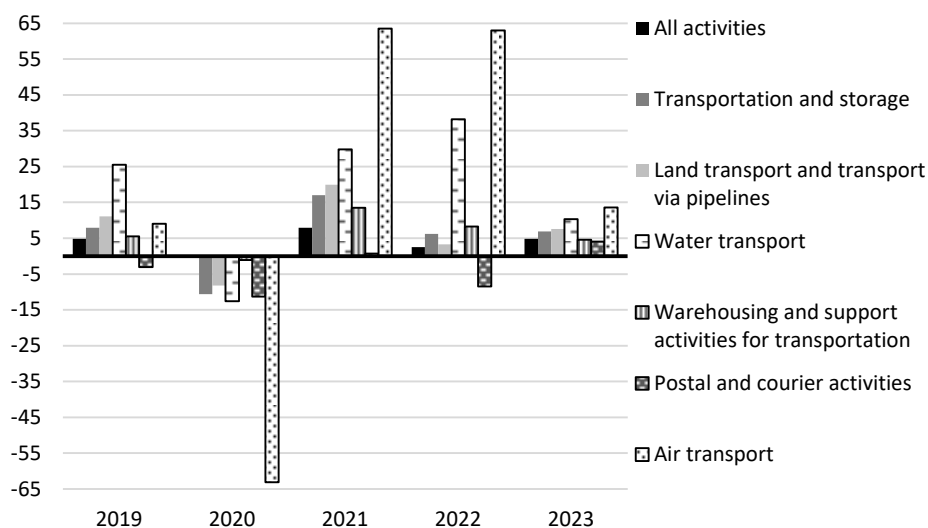
sector in double-digit growth rates throughout the observed five-year period. Conversely, in 2020, these same sectors suffered the most significant declines. Air transport, in particular, was severely impacted by the COVID-19 pandemic, recording a substantial decline in real GVA of 63%. Postal and courier activities experienced a cumulative decline in gross value added of approximately 17% over the entire five-year period. A detailed overview of the real growth rates for the transportation sector and its divisions is provided in Figure 3.

Figure 2. Structure of GVA of the transportation sector by divisions



Source: Statistical Office of the Republic of Serbia (2024)

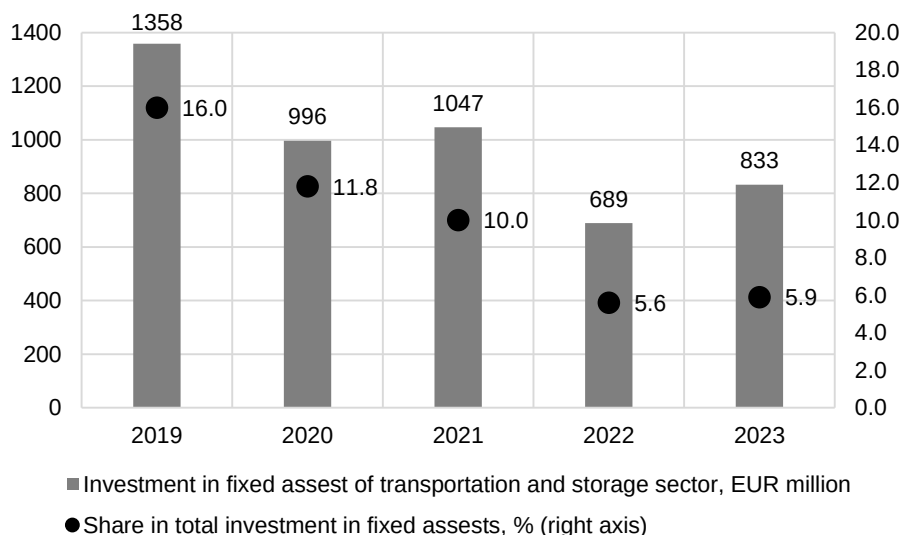
Figure 3. Real GVA growth rate of the transportation sector and its divisions



Source: Statistical Office of the Republic of Serbia (2024)

In 2023, investments in fixed assets of the transportation sector totaled 833 million euros. At 5.9%, this represented a notable share of total investments in fixed assets in the Serbian economy. However, both the value of investments and the sector's participation in total investments in the Serbian economy declined during the observed five-year period. A visual representation of this trend can be found in Figure 4.

Figure 4. Investment in fixed assets of the transportation sector in Serbia



Source: Statistical Office of the Republic of Serbia (2024)

The transportation sector consistently contributes about 5.6% to total employment in Serbia, representing approximately 130,000 workers. However, average earnings in the transportation sector are somewhat lower than the national average. In 2023, the average net earnings in the transportation sector were 733 euros. Air transport stands out in terms of earnings, with an average of about 1,650 euros recorded in 2023. Above-average earnings were also observed in water transport and warehousing and support activities for transportation, exceeding 800 euros. Regarding real earnings growth, the transportation sector lags behind the overall economy, showing slightly lower growth. Water transport and warehousing and support activities for transportation are the only divisions that showed real earnings growth throughout the entire observed period, including during the pandemic. Conversely, despite having the highest earnings, the air transport sector experienced a real decline in earnings during the observed period. A detailed overview of the labor market indicators can be found in Table 2.

Table 2. Labor market indicators of the transportation sector in Serbia

Labor market indicators		2019	2020	2021	2022	2023
Number of employees, thousands		119.0	122.9	125.0	125.7	129.4
Share in total employment, %		5.7	5.7	5.6	5.6	5.6
Monthly average net earnings by economic activities, EUR	All activities	466.0	510.9	560.2	637.9	733.5
	Transportation and storage	427.3	450.7	472.9	536.6	621.1
	Land transport and transport via pipelines	347.9	374.9	400.7	446.3	513.1
	Water transport	446.5	491.3	552.0	667.1	811.5
	Air transport	1,501.3	1,313.3	1,287.8	1,501.4	1,649.4
	Warehousing and support activities for transportation	551.4	572.5	606.3	699.9	813.2
	Postal and courier activities	393.3	438.7	451.9	504.7	572.3
Indexes of real average net earnings by economic activities	All activities	108.5	107.7	105.4	101.7	102.4
	Transportation and storage	108.8	103.5	100.9	101.3	103
	Land transport and transport via pipelines	106.1	105.8	102.8	99.5	102.4
	Water transport	107.9	108.1	108	107.9	108.3
	Air transport	132.4	85.9	94.2	104.1	97.9
	Warehousing and support activities for transportation	107.9	102	101.8	103	103.5
	Postal and courier activities	106.6	109.5	99	99.7	101

Source: Statistical Office of the Republic of Serbia (2024)

The transportation sector contributes 12.65% to the consumer basket. The majority of this (8.71%) is due to the operation of personal transport equipment, with nearly three-quarters of that related to fuels. Over the five-year period, Serbia's cumulative inflation was 43.9%. During the same period, goods and services in the transportation sector saw a price increase of 21.9%, which indicates that the transportation sector had a relatively minor impact on overall inflation in Serbia. The transportation sector is characterized by price declines during the pandemic due to reduced transport demand and a slightly more significant price increase in the following year, driven by increased demand and higher energy (fuel) prices. During the observed period, air transport of passengers experienced a cumulative decrease in

prices, while the largest price increase was recorded in railway transport of passengers. Annual price indices of the consumer basket for the transportation sector are presented in Table 3.

Table 3. Consumer price indices related to transport in Serbia

CPI element	2019	2020	2021	2022	2023	2024	2019-2024
Total	101.9	101.3	107.9	115.1	107.6	104.3	143.9
Transport	100.4	94.6	113.5	109.2	101.1	102.4	121.9
Purchase of vehicles	95.8	99.7	103.7	107.3	104.2	102.0	113.0
Operation of personal transport equipment	100.9	91.8	118.3	109.2	101.8	102.1	124.4
Transport services	102.1	99.9	101.0	110.9	95.5	104.1	113.6
Passenger transport by rail	100.0	100.0	115.4	100.0	100.0	123.8	142.9
Passenger transport by road	102.8	99.8	100.9	113.3	94.6	104.7	116.2
Passenger transport by plane	99.3	100.1	100.0	99.8	99.9	99.8	98.9

Source: Statistical Office of the Republic of Serbia (2024)

Table 4 presents data on the business operations of enterprises and entrepreneurs within the transportation sector. Enterprises in this sector represent 6.9% of the total number of enterprises in Serbia, while entrepreneurs account for 7.1% of the total number of entrepreneurs. In the previous year, there was a modest increase in the number of both enterprises and entrepreneurs, as well as their relative proportions. The combined assets of enterprises and entrepreneurs in the transportation sector totaled 13.4 billion euros in 2023, comprising 6.6% of the total assets of all enterprises and entrepreneurs in the Serbian economy. However, the transportation sector's contribution to total operating income and particularly to net profit was comparatively lower. Total operating income for the sector in 2023 was 10 billion euros, which is equivalent to 6% of the total operating income for the entire Serbian economy. The sector's net profit was 335 million euros, representing 3.8% of the total net profit across the entire economy.

Table 4. Indicators of business entities of the transportation sector in Serbia

Indicator	2022	2023
Number of enterprises in the transportation sector	7,583	7,626
Share in total number of enterprises in the economy	6.8%	6.9%
Number of entrepreneurs in the transportation sector	8,183	8,267
Share in total number of entrepreneurs in the economy	7.0%	7.1%
Total assets of the transportation sector, EUR billion	12.8	13.4
Share in total assets of the entire economy	6.8%	6.6%
Operating income of the transportation sector, EUR billion	9.6	10.0
Share in operating income of the entire economy	5.9%	6.0%
Positive net result of the transportation sector, EUR million	270.6	335.9
Share in positive net result of the entire economy	3.4%	3.8%

Source: The Serbian Business Registers Agency (2024)

4. Conclusions

The transportation sector, and especially investments in transport infrastructure, has a significant impact on economic growth and development, productivity, and employment in the economy, as evidenced by numerous theoretical and empirical findings. In this paper, the importance of this sector for the macroeconomic performance of the Serbian economy was determined. The transportation sector contributes 4.7% to the total gross value added of the Serbian economy, with this participation showing a growing trend during the observed five-year period. The most important divisions of the transportation sector are land transport and transport via pipelines, as well as warehousing and supporting activities for transportation, which together account for around 85% of the GVA of the transportation sector.

In contrast to other divisions, a trend of decreasing share of postal and courier activities in the total GVA of the transportation sector was observed, as well as a continuous decline in the realized GVA of this division. On the other hand, the air transport division is characterized by significant oscillations, caused above all by the COVID-19 pandemic. Apart from air transport, after the first year of the pandemic, water transport was also characterized by double-digit annual growth rates of gross value added.

When it comes to investments in fixed assets, the share of the transportation sector is slightly higher than its share in gross value added and amounts to

5.9%, while the share of employment in the economy is 5.6%. Average earnings in the transportation sector are lower than in the rest of the Serbian economy, with the exception of the air transport division, where earnings are more than twice as high as the average for the Serbian economy. In addition, significantly higher earnings are recorded in the water transport and storage and logistics divisions compared to the rest of the sector.

Goods and services from the transportation sector account for 12.65% of Serbia's average consumer basket. The contribution to inflation is relatively small compared to other goods and services in the consumer basket, bearing in mind that the cumulative price growth in the transport sector is twice as low in the observed five-year period compared to the cumulative growth of all prices that make up the consumer price index.

Enterprises and entrepreneurs registered for carrying out transportation activities make up about 7% of the total number of enterprises and entrepreneurs in the Serbian economy, and they own 6.6% of the total assets of the Serbian economy. They create 6% of operating income, while the share in the positive net result is significantly lower, amounting to 3.8%.

References

- Banister, D., & Berechman, J. (2000). *Transport investment and economic development*. UCL Press.
- Cowie, J. (2010). *The economics of transport: a theoretical and applied perspective*. Routledge, Taylor & Francis Group, London & New York.
- European Commission. (2014). *Infrastructure in the EU: Development and Impact on Growth*. Occasional Papers 203.
- Fedderke, J., & Garlick, R. (2008). *Infrastructure development and economic growth in South Africa: a review of the accumulated evidence*. University of Cape Town, Policy Paper Number 12.
- Kotschwar, B. (2012). *Transportation and communication infrastructure in Latin America: Lessons from Asia*. Peterson Institute for International Economics, Working Paper Series No. 12-6.
- Lakshmanan, T.R. (2007). *The wider economic benefits of transportation: an overview*. Discussion Paper No. 2007-8, OECD & ITF, Joint transport research centre.
- Lavee, D. (2019). The impact of investment in transport infrastructure on employment: the case of Israel. *European Transport \ Trasporti Europei*, 74(3), 1-21.
- Miljković, M. (2019). *Uticaj investicija u saobraćajnu infrastrukturu na privredni rast evropskih zemalja*. Doctoral Dissertation, University of Belgrade – Faculty of Economics.

- Miljković, M., Jovanović Gavrilović, B., & Petrović-Vujačić, J. (2018). The transEuropean transport corridors: contribution to economic performances of European regions. *Industrija*, 46(2), 173-187.
- Miljković, M., & Petrović-Vujačić, J. (2016). Economic impact of transport infrastructure investment. *Proceedings of the third International Conference on Traffic and Transport Engineering*, 831-838, 24-25 November 2016, Belgrade, City Net Scientific Research Center Ltd. Belgrade.
- National Bank of Serbia. (2024). *Database*. Retrieved from: https://www.nbs.rs/sr/drugi-nivo-navigacije/statistika/ks_stat/
- Panayotis, C., Cawood, E.N., Cusco, V.P., Vroonhof, P., Schoemaker, J., & Artuso, D. (2014). Employment, skills and working conditions in transport. European Commission, Joint Research Centre, Institute for Prospective Technological Studies, Seville.
- Schade, W., Krail, M., Hartwig, J., Walther, C., Sutter, D., Killer, M., Maibach, M., Gomez-Sanchez, J., & Hitscherich, K. (2015). *Cost of non-Completion of the TEN-T*. Fraunhofer Institut für System und Innovationsforschung.
- Serbian Business Registers Agency. (2024). *Annual Report on the Performance of Legal Entities, Entrepreneurs and Consolidated Groups*.
- Statistical Office of the Republic of Serbia. (2024). *Database*. Retrieved from: <https://data.stat.gov.rs/?caller=SDDDB&languageCode=sr-Latn>
- Venables, A. (2006). *Infrastructure, trade costs and the gains from international trade*. Transport and international trade – Roundtable 130, OECD & ECMT, Paris.
- Wallis, I. (2009). *Economic development benefits of transport investment*. Land Transport New Zealand Research Report 350.
- Walsh, J.P., Park, C., & Yu, J. (2011). *Financing Infrastructure in India: Macroeconomic Lessons and Emerging Market Case Studies*. IMF Working Paper WP/11/181
- Weisbrod, G., & Reno, A. (2009). *Economic impact of public transportation investment*. Prepared for American Public Transportation Association.
- Wilson, J.S., Luo, X., & Broadman H.G. (2006). *Trade and transport facilitation: European accession and capacity building priorities*. Transport and international trade – Roundtable 130, OECD & ECMT, Paris.