Economic Cooperation between the Republic of Serbia and the Member States of the Visegrad Group

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Abstract

The paper analyses the effects and measures the intensity of economic co-operation that Serbia has achieved with the member countries of the Visegrad Group (V4 Group) from 2000 until today. The starting hypothesis is that the common cultural and historical heritage, the geographical proximity of the mar-ket and the common experience of the economic transition process can be an incentive for the development of economic cooperation between Serbia and the countries of the V4 Group. A gravity econometric model Poisson Pseudo Maxi-mum Likelihood (PPML) estimator was used to test the hypothesis. The results of the research confirm a significantly positive impact of the GDP of Serbia and the observed countries, a significantly negative impact of distance and a signifi-cantly positive effect of the neighbourhood on bilateral trade flows. Predictors related to the quality of institutions also have a significant positive effect on increasing bilateral trade cooperation between Serbia and the V4 Group.

Introduction

The Visegrad Group (V4), to which the Czech Republic, Slovakia, Poland and Hungary belong, is the oldest regional integration in Europe excluding the European Union. It originated in the early 1990s as a reaction to the new world order which was based on the idea of creating a global world by connecting geo-graphically close countries into regional integration. From the point of view of

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the countries of Central and Eastern Europe, these processes were a novelty and a great challenge, since they entailed a fundamental transformation of their political and social systems from socialist to democratic, and their transition from centrally planned to a market economy. At the beginning of the last decade of the twentieth century, the European Union already had a long tradition of linking regional countries and the process of globalization was seen as a lever to further strengthen the integration process. Unlike the European Union, the countries of Central and Eastern Europe, in this period, found themselves at a crossroads between the two systems. At the very beginning of the transition process, the Czech Republic, Slovakia, Poland and Hungary opted for the European integration and showed a high degree of readiness for institutional and economic changes in line with those fostered by the European Union. With this common goal, they established the Visegrad Group in 1991 in the Hungarian town Visegrad. The integration was based on the geographical proximity of the countries, a high degree of their historical and cultural cohesion and their common tradition. A very important factor in the beginning and the survival of the V4 group was the similar level of economic development of the member States, which was higher than that achieved by other socialist countries such as Romania, Bulgaria and the countries of the former Yugoslavia.

At the same time when the V4 members states were united in the process of transition and started moving towards the building of market economy institutions, in the countries of former Yugoslavia quite the opposite processes took place: fragmentation, war conflicts and the vaguely articulated attitude of the former republics towards the transition process. Events on the political scene that marked the '90s in Serbia had major and far-reaching consequences on its future political, social and economic development. According to the geographic-administrative criterion, Serbia today belongs to the group of Western Balkan countries, respectively, the group of Balkan countries in transition. According to macroeconomic parameters, Serbia belongs to a group of developing countries and is on the margins of economically developed Europe. From 2000 until today, Serbia has been actively working on improving political and economic relations with the countries of the European Union, and those relations are in the function of its European integration. In this context, its cooperation with the member countries of the V4 group should be considered. This cooperation is based primarily on the geographical proximity of the market and on the fact that the V4 countries have successfully completed the transition process, and that their experiences in this regard can be useful for Serbia. The decade and a half that Serbia and the member states of V4 group have spent adjusting to the new European and world order, and the same period of cooperation between Serbia and the V4

group as a part of the European Union, provides a distance from which we can objectively approach the analysis of their economic relations and identify the segments in which this cooperation could be more successful in the future. In accordance with the complexity of the topic being covered, the paper is organized as follows: after the introduction, the second part provides an overview of the literature. The third section gives a comparative analysis of Serbia and the V4 countries and the level of their economic development. In the fourth section we analyse the economic cooperation between Serbia and the member countries of V4 from the beginning of the century to the present day and in the areas of mutual trade cooperation and investment activities. The fifth part presents an empirical model. The sixth part contains the results of the research and the main conclusions.

1. Literature Review

Economic cooperation between Serbia and the members of the V4 group, its achievements, constraints and perspectives, represent a challenge for many researchers from different fields. This cooperation has its geopolitical aspects which analyses the extent to which the geographical proximity of countries determines their interest in mutual trade and other forms of economic cooperation (Domaradzki and Fronczak, 2018). The history of socio-political relations between Serbia and the V4 countries has conditioned the dynamics and quality of their foreign trade relations, which has implications for current trends and the assessment of the volume and value of trade in the future, monitored by relevant domestic and international institutions such as UN Comtrade, the Chamber of Commerce of the Republic of Serbia, the Republic Statistical Office of Serbia, etc. In addition to trade, a very important aspect of cooperation is the one in the field of investments. As a country in transition, Serbia is developmentally dependent on foreign capital inflows. The basis of investment relations between Serbia and other countries is the legal and institutional framework (Novaković and Rapaić, 2016; Álvarez et al., 2018; Beverelli et al., 2018; Groznykh, Drapkin and Mariev, 2019; Yu, Beugelsdijk and De Haan, 2015). Among the countries of the V4 group, Hungary, as the country of origin of investments, has the greatest importance for the Serbian economy (Kastratović, 2016; NBS, 2008). The second most important country in the terms of investment is the Czech Republic (Zemniczky, Csüllög and Császár, 2015). Investments originating from Slovakia and Poland are less present in the Serbian economy (Gorynia et al., 2015).

A comparative analysis of the economic development of the Republic of Serbia and the V4 countries, presented by relevant macroeconomic indicators shows

that the V4 countries during the transition process, and later, after accession to the EU recorded moderate economic growth, which allowed most of them during the global economic crisis to preserve economic stability, and to minimize the consequences of the negative effects of that crisis (Minić et al., 2015; Ivanová and Masárová, 2018). Today, the countries of the V4 group are characterized by large domestic markets, low unemployment rates and a high level of all types of consumption determined by wage growth, and these are the characteristics that provide this group of countries long-term economic stability (Roštekova and Rouet, 2014; Zieliński, 2015; Auer, 2018). According to The World Bank, Serbia has recorded a very uneven economic growth from 2000 to today (The World Bank). Periodically high growth rates are not the result of growth in investment, production, consumption and exports, but are a consequence of "the low base effect" and subsidizing state-owned enterprises, or are the result of positive factors from the international environment (Đorđević and Veselinović, 2010; Mosurović Ružičić, Fabris and Kutlača, 2017). In addition to high GDP growth rates, Serbia is also characterized by relatively low inflation rates in the observed period. Such a trend is not the result of growth in employment and living standards, but the result of applying the strategy of inflation targeting as a formal monetary policy regime of the National Bank of Serbia (NBS, 2008).

In the analysis of bilateral trade flows, gravity models of international trade are widely used. Among them, the Poisson Pseudo Maximum Likelihood (PPML) non-linear estimation model stands out (Hausman, Bronwyn and Zvi, 1984; Santos Silva and Tenreyro, 2006; 2015). This model allows zero trade flows to be included in the data set in the same way as the variables with any other value (Westerlund and Wilhelmsson, 2009; Siliverstovs and Schumacher, 2008). Unlike standard log-linear models, in which the presence of heteroskedasticity can generate different estimates (Santos Silva and Tenreyro, 2006; Motta, 2019), the PPML model allows for unbiased estimates in the presence of heteroskedasticity (Liu, 2009; Gómez-Herrera, 2013). Also, the advantage of this model is that it ensures that all observations are equally weighted with an always positive mean value (Bergstrand and Egger, 2013; Shahriar et al., 2019). Many authors also point out the shortcomings of this model. The first disadvantage is that it does not show a high degree of efficiency for an aggregated dataset in the presence of unobserved heterogeneity (Mnasri and Nechi, 2019) and that in case of neglecting the spatial dependence between origin-destination flows, the use of this model can lead to biased estimates (Krisztin and Fisher, 2015).

The basic gravitational model includes standard determinants such as: a market size measured by population, the economic size of countries measured by GDP, and distance between capitals (Anderson and Van Wincoop, 2004). For the

purpose of a more complete analysis, the gravitational model has been extended by dummies variables that show whether the observed countries share a common language, borders and whether there are signed bilateral trade agreements between them (Klasing, Milionis and Zymek, 2015). The data on relevant macroeconomic indicators used in the statistical analysis were taken from the World Bank database, the UN Comtrade database and the data on the quality of institutions were taken from the World Bank (WGI).

2. The Economies of Serbia and the Countries of the V4 Group from the Beginning of the Transition until Today: A Comparative Analysis

The current economic position of Serbia in Europe and the world, the manner and the achieved quality of its economic development are the result of the processes that took place in this area in the late 1980s. At that time, Serbia was entering the process of transition, insufficiently prepared for the radical changes that that process required and with a very unarticulated attitude towards that process and the challenges it entailed. Rising political conflicts and tensions, declining social production, rising unemployment, impoverishment of the state and citizens individually, rising crime and corruption, and the erosion of morals and other social values have conditioned the transition in Serbia to be understood and experienced as a process of social disintegration, rather than a constructive process that leads to general progress and the adoption of the values and standards of the European Union. During the three decades of implementation of the transition, the social image and the economic position of Serbia in Europe and the world have not changed significantly. In addition to the comprehensive engagement of domestic forces in this process and the assistance of the European Union and other international actors to accelerate the transition process, the real balance of transitional changes is such that Serbia, economically, politically and culturally keeps a great distance from developed Europe.

T a b l e 1

Macroeconomic Indicators of Economic Development of Serbia in the Period from 2000 to 2018

	2000	2005	2010	2015	2018
GDP (current USD, mil. USD)	6,540.25	27,683.23	41,819.50	39,628.55	50,508.37
GDP annual growth in %	7.8	5.5	0.7	1.8	4.3
Inflation (annual in %)	71.1	16.1	6.1	1.4	2.0
Unemployment (%of total labour force)	12.6	20.9	19.2	17.9	13.5
Balance of external trade	−291.94	−4,730.22	−5,110.32	−2,766.55	−4,224.68
FDI inflow in mil. USD	51.78	1,577.03	1,693.25	2,343.14	4,107.32

Source: <https://databank.worldbank.org/source/world-development-indicators>, Accessed in November, 2019.

The data shown in the table show oscillations in the process of economic transition in Serbia and rather uneven development in the post-period period. The high GDP growth rates recorded at the beginning of the observed period are the result of a very low starting base in the early and late 1990s (low base effect), rather than growth in investment, production, consumption and exports (Đorđević and Veselinović, 2010, p. 22). In the period after the global economic crisis, from 2010 to 2015, economic growth averaged about 0.5%. The sharp growth of GDP to 4.3% in 2018 is the result of favourable effects of the international environment: falling commodity prices on the world market, lower interest rates on borrowing in Euros and the recovery of the Eurozone, not the positive effects of endogenous growth generators: new products, exports to new markets, new organizations of industrial production, etc. (Mosurović Ružičić, Fabris and Kutlača, 2017, p. 64 – 65). In the observed period, Serbia managed to significantly reduce the inflation rate and reduce it to a latent level. The low inflation rates are not based on the parameters of stable and sustainable economic growth generated by employment growth and improvement of living standards, but are the result of inflation targeting and the implementation of this strategy as the official monetary policy regime of the National Bank of Serbia (NBS, 2008). The unemployment rate of 13.5%, despite the decline, remains high. The positive trend that exists in reducing unemployment may be the result of an increase in the number of production facilities that were opened throughout Serbia thanks to foreign investors, but also the result of intensive migration of young highly qualified personnel from Serbia.

It is obvious that in the observed period, Serbia has been experiencing a chronic and growing foreign trade deficit. The process of deindustrialization, which has been continuously implemented since the beginning of the 1990s, at the expense of the development of the services sector, results in low competitiveness of Serbian products on the foreign market, which has a negative impact on exports. On the other hand, the growth of domestic demand conditions the growth of imports, which ultimately determines the negative foreign trade balance.

The way in which the transition process was carried out in Serbia, especially in the 1990s and at the beginning of this century, conditioned the increase in crime and all forms of corruption. Institutional adjustment realized through abandonment of old rules, business customs and restrictions with unclear definition of new ones, which correspond to the system of market economy, was expected in the initial phase of transition. However, the vaguely defined time frame, in which this institutional adjustment took place, caused major and far-reaching consequences for Serbia's economic development. Political risk, lack of institutions, absence of the rule of law, complicated administrative procedures related to

starting a business, and monetary instability, transferred from the 1990s, conditioned the low volume of foreign investments at the beginning of this century. However, during the observed period, Serbia has significantly improved its business environment and has become recognized in Europe and the world as a very favourable destination for foreign investment. Despite large amounts invested on the basis of foreign direct investments, Serbia today does not have a single capital investment that would ensure economic development in the long run. Unlike Serbia, the V4 countries have a much more positive experience from the transition period. The way in which this group of countries went through the transition process has been recorded in history as unique in terms of the speed of change and the efficiency of adaptation, and in many respects (Roštekova and Rouet, 2014, p. 181). Compared to Serbia and other countries in transition, V4 members have shown exceptional vitality and adaptability to the challenges of a democratic society and market economy, as well as willingness to implement change peacefully.

The V4 group, as a regional integration in Europe, is of great importance. It covers an area of over half a billion square kilometres and represents a market of almost 64 million consumers <https://databank.worldbank.org>. From the aspect of countries outside the European Union, the V4 group is an example of a successful transition, especially in terms of intra-regional relations, speed of adoption of Acquis communautaire, and efficiency in the implementation of institutional changes and public administration reform. A decade and a half long period from the entry of these four countries into the European Union enables the scope of their economic development, their economic position in the European Union and economic relations with countries outside the European Union to be assessed objectively and accurately.

T a b l e 2

Macroeconomic Indicators of Economic Development of the V4 in 2018

	Surface area (sk.km)	Population (total)	GDP per capita in PPS (EU-28 = 100)	GDP growth in %	Unemployment (in %)	Inflation (in %)
Hungary	93,030	9,768,785	70	4.9	3.7	2.9
Czech Republic	78,870	10,625,695	90	3.0	2.4	2.1
Slovak Republic	49,030	5,447,011	78	4.1	6.8	2.5
Poland	312,680	37,978,548	71	5.1	3.7	1.8

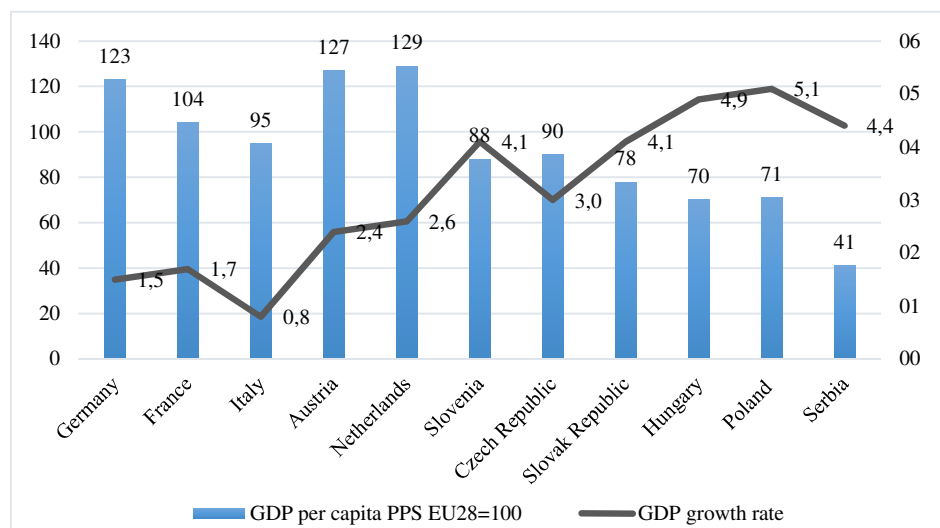*Source:* <https://databank.worldbank.org/source/world-development-indicators>, Accessed on November 11, 2019. Data about GDP per capita in PPS (EU-28 = 100), GDP growth rate, General government balance and gross debt: <https://ec.europa.eu/eurostat/databrowser/view/tec00114/default/table?lang=en>, Accessed on November 11, 2019.

Like all Central and Eastern European countries, the V4 countries based their economic growth strategy on the inflow of foreign direct investment at the beginning of the transition (Bellak and Narula, 2009, p. 71). Growing foreign capital

investments, along with increasing production and exports, improving the quality of institutions and greater availability of technological innovations, had positive effects on improving macroeconomic performance and generated the flow and dynamics of economic development of this group of countries. The parameters shown in Table 2, compared to those current in 2004, show that these countries made significant economic progress. In the year of EU accession, GDP growth was: in the Czech Republic 4.9%, Hungary 5.0%, Poland 5.1% and Slovakia 5.3% <https://databank.worldbank.org>. The lower values of GDP growth, which were recorded in some countries in 2018, are a consequence of the negative effects of the global economic crisis, which was reflected in the slower growth in that period (Minić et al., 2015, p. 5). Poland emerged from the world economic crisis as the most successful among the new members of the European Union, which was not significantly affected by its negative effects. In other countries of this group, the slower growth of GDP during the crisis, and even later, in the observed year, was a consequence of their weaker defence capabilities against the blows of the crisis and a great challenge to preserve economic stability in that period. The GDP growth rate in 2018 compared to the one of 2004 was particularly reduced in the Czech Republic. This reduction is justified if we keep in mind that the Czech Republic was significantly affected by the crisis, and during which it achieved even negative growth rates (Ivanová and Masárová, 2018, p. 279).

F i g u r e 1

GDP of the Visegrad Group Countries and Selected EU Countries in 2018
(Comparative view in %)

Source: <https://ec.europa.eu/eurostat/statistics-explained/index.php/GDP_per_capita,_consumption_per_capita _and_price_level_indices> and <http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=tec00115&lang=en>, Accessed on November 14, 2019.

Figure 1 provides a comparative overview of GDP growth rates in 2018 and the percentage of GDP per capita in relation to the EU-28 average for countries in the V4 group, selected EU countries and Serbia. The values show that the countries of the V4 group achieve higher growth rates than the other group of observed EU countries. Serbia also achieves higher growth rates in relation to selected EU countries, but they are a consequence of the above-mentioned factors, and not a reflection of real economic growth. As for the values of GDP per capita, they are lower in the countries of the V4 group than those achieved by developed Western European economies, approximately at the level achieved by Slovenia, and significantly higher than those currently in Serbia.

By comparing the data on inflation in the V4 countries, which in 2004 amounted to 2.8% in the Czech Republic, 6.7% in Hungary, 3.4% in Poland and as much as 7.5% in Slovakia with the data presented in Table 2, it can be concluded that the countries of the Visegrad Group have achieved price stability in the past 15 years and managed to reduce the inflation rate to a latent framework <https://databank.worldbank.org>. The development strategy based on foreign direct investments, i.e. stimulating the growth of production and the development of the service sector, resulted in the reduction of unemployment in all countries of the Visegrad Group (Su et al., 2018, p. 1966). The largest decrease in unemployment was recorded in Poland and Slovakia, where in 2004 19.1% and 18.6% of the working age population were unemployed, respectively. Also, in 2004, the Czech Republic recorded an unemployment rate of 8.2%, and Hungary 5.8%, which was almost twice as much as the unemployment rate that is current in those countries today. Numerous analyses show that today the common features of the V4 countries that ensure stable growth are: large domestic markets, low unemployment rates and a high level of all forms of consumption determined by wage growth (Zieliński, 2015, p. 187; Auer, 2018, p. 64 – 65).

3. Economic Cooperation between Serbia and the Member Countries of the Visegrad Group

The starting point of the analysis of Serbia's economic cooperation with the member countries of the V4 group is related to the beginning of the transition process. However, this cooperation has its own history, that is, it existed in previous historical periods, which were characterized by different geopolitical conditions. The degree of that cooperation, measured by the dynamics and volume of mutual trade, as well as investment activities, has been conditioned by the geographical position of the countries, their foreign policy relations and economic interests. From a geographical point of view, the Czech Republic, Hungary and

Slovakia, as well as Serbia, are connected to the Danube region. Thanks to its geographical proximity, which largely determines both regional foreign policy interest and interest in economic cooperation, these three countries are much more connected to Serbia and other Balkan countries than Poland, which is geographically oriented towards the Baltic region. Despite the fact that in the observed period, Poland had a positive foreign trade balance with Serbia, the volume of their bilateral trade was modest (Domaradzki and Fronczak, 2018, p. 38). Based on the data presented in Tables 3 and 4, it can be seen that Poland has a positive trade balance with Serbia, and that a more dynamic foreign trade between these two countries has been recorded only in the last two observed years.

Despite the fact that the cooperation in the field of foreign trade between Poland and Serbia is dynamic and growing, Poland's economic presence in Serbia is modest (Domaradzki and Fronczak, 2018, p. 38).

T a b l e 3

Imports in Serbia from the Visegrad Group Member States in 000 USD
(current prices)

	2000	**2004**	**2008**	**2012**	**2016**	**2018**
Czech Republic	81,570.00	223,794.91	368,397.55	387,599.21	482,793.42	652,052.28
Slovak Republic	35,751.00	153,748.34	378,885.59	251,832.18	250,328.11	274,841.27
Hungary	122,502.00	321,234.78	815,308.42	933,157.40	883,178.97	1,242,143.80
Poland	32,998.00	183,737.33	410,409.44	525,779.56	834,275.97	921,663.20

Source: UN Comtrade: <http://comtrade.un.org/data>, Accessed on November 6, 2019.

T a b l e 4

Export from Serbia into the Visegrad Group Member States in 000 USD
(current prices)

	2000	**2004**	**2008**	**2012**	**2016**	**2018**
Czech Republic	19,594.00	48,632.68	148,091.35	169,650.38	367,533.21	577,929.08
Slovak Republic	8,410.00	19,883.66	225,976.12	253,669.33	302,093.50	392,980.02
Hungary	61,512.00	128,035.03	324,836.25	315,608.81	477,556.54	777,964.59
Poland	7,580.00	29,578.13	155,842.54	160,753.01	336,024.48	459,573.41

Source: UN Comtrade: <http://comtrade.un.org/data>, Accessed on November 6, 2019.

Based on the data on the value of bilateral commodity trade between Serbia and the V4 countries, it can be concluded that Hungary is the most important foreign trade partner of Serbia. According to the statistics, Hungary is in seventh place in terms of exports, while in terms of imports it occupies the fifth place (Serbian Chamber of Commerce). Germany and Italy are ahead of Hungary, followed by neighbouring countries in transition Bosnia and Herzegovina and Montenegro, and even the Russian Federation and China, with which Serbia has been expanding its foreign trade cooperation in recent years. In the list of the most important export markets of Serbia, the Czech Republic occupies the 12th

place, while Poland and Slovakia are 15th and 16th respectively (Statistical Office of the Republic of Serbia). In the list of the most significant import markets, these three countries occupy identical positions as in the list of the most important export markets.

Serbia performs more than two thirds of its foreign trade transactions with the countries of the European Union, so from those aspects, the countries of the V4 group, as part of the union, are of great importance to it. The countries of V4 are export oriented mainly towards the Western European market. A large part of the imports they also realized from the EU countries, but also from the Russian Federation, from which they are supplied with oil and natural gas. Neither of them recognizes Serbia as a significant partner in foreign trade relations (Main Indicators of the Visegrad Group Countries, 2018, p. 40). Serbia is in none of the countries of the V4 group on the list of the top 15 foreign trade partners. In Hungary, for example, Serbia occupies the 18th place in both the list of the most significant importers and the list of the most significant exporters. Hungary sells 1% of its total exports to Serbia, while imports from Serbia represent only 0.67% of the total Hungarian imports (UN Comtrade). In other V4 countries, Serbia, as a foreign trade partner, is placed far worse. According to the author's calculations based on the data of the Comtrade database, the Czech Republic places 0.32% of its total exports to Serbia, while only 0.25% of its total imports are products from Serbia. Out of the total exports of Slovakia and Poland, 0.39% is directed to the Serbian market, while imports from Serbia to Slovakia account for 0.45% of the total imports, and to Poland only 0.19% of the total imports of that country (UN Comtrade).

The economies of the V4 countries are very similar in terms of their economic structure. Their common feature is the high share of industry in GDP, which shapes their export supply and import needs. The structure of Serbia's foreign trade with the V4 countries is a reflection of the state of its economy and an indicator of its place in the European economic relations. The dominant share in the structure of Serbian exports to the market of the V4 countries includes parts for the automotive industry, electric cables, sets of ignition conductors, electrical equipment for lighting and signalling, parts for car seats, etc. (Statistical Office of the Republic of Serbia). The structure of Serbian imports from the V4 countries varies from country to country. For example, Serbia imports cars from the Czech Republic and phones, televisions, motor vehicles and parts for motor vehicles from Slovakia. Serbia imports medicine and gas oils from Hungary, and from Poland parts for the motor vehicles, fruits and vegetables and chemical products (Statistical Office of the Republic of Serbia). The comparison of export and import structures gives a more complete picture of the level of economic

development of Serbia and emphasizes its economically inferior position vis-à-vis the European Union.

Another aspect of the economic relations between Serbia and the V4 countries is their cooperation in the field of investment. As a country in transition, Serbia defined an institutional and legal framework for foreign investment in the early 1990s. In addition to national regulations, the legal framework for foreign investments also includes bilateral and multilateral agreements Serbia has signed with the EU and the V4 group in this area (Novaković and Rapaić, 2016, p. 171). Despite the geographical proximity, historical and economic ties that exist between Serbia and these countries, their investment activity in the Serbian economy is at a very low level compared to other Western European countries. By 2014, Hungarian investments in Serbia had reached 371.2 million Euros (Kastratović, 2016, p. 78). The largest part of investments was placed in the sector of the oil industry, the financial sector and the sector of the production of raw materials. According to the records of the Serbian Chamber of Commerce, the number of companies whose owners are mainly citizens of the Czech Republic, is over two hundred, and the total investment of this country in the Serbian economy, by the year 2017, had amounted to 35.5 million Euros (NBS, 2008). The largest investments are directed to the sector of telecommunications and finance, the sector of mineral water production, the sector of industrial production, and also to the construction sector and the auto-industry. In recent years, Serbia and the Czech Republic have been cooperating in the field of environmental protection (Zemniczky, Csüllög and Császár, 2015, p. 38). The value of Slovak investments in the Republic of Serbia until 2017 had amounted to 62.617 million Euros (NBS, 2008). The largest investments are directed to the energy sector, the exploitation of renewable energy sources, the production of food products, and a smaller part, to the industry and construction sectors. The total value of investments of Polish companies in the Serbian economy is around thirty billion Euros, and they are focused on the automotive industry, construction, energy, chemistry and information technology (Gorynia et al., 2015, p. 331).

Investment activity of Serbian companies in the economies of the V4 countries is at a very low level. This trend should be expected in the future, given the fact that there are no large companies in Serbia that have the potential to invest abroad.

The quality of trade and wider economic relations between two or more countries largely depends on the quality of their institutions (Álvarez et al., 2018. p. 77, Beverelli et al., 2018; Groznykh, Drapkin and Mariev, 2019, p. 105). The importance of assessing the impact of the quality of institutions on trade relations stems from the fact that this impact is a two-way process: a higher level of quality of institutions can result in higher foreign trade, but also increasing trade encourages

improving the quality of institutions (Yu, Beugelsdijk and De Haan, 2015, p. 110). Having that in mind, the paper also analyses the impact of the quality of the institutions of Serbia and the countries of the V4 group on their mutual trade.

4. Research Methodology

In the empirical analysis of economic cooperation between Serbia and the V4 countries, analysed through the prediction of their bilateral trade, the Poisson Pseudo Maximum Likelihood (PPML) gravity model as a nonlinear estimation model that is applied in the measurement of potential trading flows has been used (Hausman, Bronwyn and Zvi, 1984).

This model was chosen because it has great theoretical significance and wide application in the assessment of bilateral trade flows between countries that show a high degree of openness to international trade. One of the leading advantages of using this model is that it allows zero values of trade flows to be included in the data set, in the same way as variables with any other value (Santos Silva and Tenreyro, 2006, p. 644; Westerlund and Wilhelmsson, 2009, p. 642). This means that the potential trade of volume of investment that could be predicted by this model may or may not be close to zero, but may be equally included as variables with any other value (Siliverstovs and Schumacher, 2008, p. 141 – 143). From the aspect of this paper, this possibility is especially important considering that these are trade and investment flows of small volume and value or even zero value regarding to the investment activity of Serbia in the economies of the V4 countries.

Another significant advantage of the PPML model is that it takes into account the problem of interpreting the parameters of log-linearized models and enables impartial estimates in the presence of heteroskedasticity (Liu, 2009, p. 431; Gómez-Herrera, 2013, p. 1094). The PPML model has been recognized and accepted in statistical econometric analyses as a robust replacement for the standard log-linear model. This is because the presence of heteroskedasticity in standard log-linear models can generate different estimates rather than estimates in levels, which suggests that based on analyses performed using these models, erroneous conclusions can be drawn (Santos Silva and Tenreyro, 2015; Motta, 2019, p. 509). The role of PPML models is to correct the issues of coefficient biasedness and heteroskedasticity in log-linear models, which significantly reduces the possibility of accepting erroneous conclusions that can be reached by applying standard log-linear models (Motta, 2019, p. 509 – 510). Given that the PPML model deals with both heteroskedasticity and zero trade flows simultaneously, this model was selected as optimal for the analysis of bilateral trade flows between Serbia and the countries of the V4 group.

Another advantage of this model is that it ensures that all observations are equally weighted with an always positive mean value (Bergstrand and Egger, 2013, p. 540; Shahriar et al., 2019, p. 32).

One of the main disadvantages of the PPML model is that it does not show a high degree of efficiency for the aggregated dataset in the presence of unobserved heterogeneity (Mnasri and Nechi, 2019, p. 7). The use of PPML models in gravity equation estimation can lead to biased parameter estimates if spatial dependence is neglected between origin-destination flows (Krisztin and Fisher, 2015, p. 459).

From the aspect of technical application, PPML model has now become widely available and its use is possible using a different statistical software packages. In this analysis was used the STATA 14.2 software package and the PPML script analysis.

The basic gravity model includes standard determinants such as market size, measured by population, economic size of countries measured by GDP, and distance between capitals (Anderson and Van Wincoop, 2004). According to the initial hypothesis that the cultural and historical heritage, geographical proximity to markets and the shared experience of the transition process have an influence on the level and quality of economic cooperation between Serbia and the V4 countries, the gravity model has been expanded with dummies variables that indicate whether Serbia with the V4 countries share a common language and borders, and whether bilateral trade agreements have been signed between them (Klasing, Milionis and Zymek, 2015, p. 5).The values of the dummy variables are: 1 in the case when the observed countries share a common language, 0 otherwise; 1 in the case of close neighbours sharing a common border, 0 otherwise; 1 in the case the observed countries have signed bilateral agreements on foreign trade, 0 otherwise. Also, to test the dependence of trade flows between these countries on foreign direct investment, they are included in the model as a dummy variable with value 1 if in the observed period foreign direct investment inflows from the V4 countries to Serbia amounted to at least 100 million Euros per year and 0 otherwise.

The basic linear model of the equation is:

$$T_{ij} = \alpha Y_{it}^{\beta_1} * N_{it}^{\beta_2} * Y_{jt}^{\beta_3} * N_{jt}^{\beta_4} * D_{ij}^{\beta_5} * \exp(\delta A_{ij}) \varepsilon_{ijt}$$

where

T_{ij} — bilateral merchandise trade between countries i and j;
Y_i and Y_j — GDP of countries i and j in thousand USD current prices;
N_i and N_j — population number of countries i and j;
D_{ij} — distance between the countries i and j.

Regression models for predicting import and export volumes take the form:

$$T_{ij} = e^{\beta_0 + \beta_1 \ln(Y_i) + \beta_1 \ln(Y_j) + \beta_3 \ln(D_{ij}) + \beta_4 Adj_{ij} + \beta_4 Fdi_{ij}} \eta_{ij}$$

where

Y_i – GDP of the partner country;

Y_j – GDP of Serbia;

D_{ij} – distance between the capitals of the partner country and Serbia;

Adj_{ij} – an indicator of whether the partner country borders with Serbia ($Adj = 1$) or not ($Adj = 0$);

Fdi_{ij} – indicator of FDI inflow greater than 100 million Euros per year ($Fdi = 1$) or not ($Fdi = 0$);

η_{ij} – the error factor.

Bearing in mind the huge importance of the quality of institutions for the development of trade and economic relations between countries, this model is further expanded by three variables that describe the quality of institutions in Serbia and the countries of the V4 group.

$$T_{ij} = e^{\beta_0 + \beta_1 \ln(D_{ij}) + \beta_2 \ln(Y_i) + \beta_3 \ln(Y_j) + \beta_4 A_{ij} + \beta_4 Fdi_{ij} + \beta_5 C_i + \beta_6 G_i + \beta_7 R_i} \eta_{ij}$$

These are:

C_i – Control of corruption, which includes the perception of the extent to which the benefits of public authority are used for private purposes;

G_i – Government Effectiveness which provides data on the quality of public services, the quality of the civil service and the degree of its independence;

R_i – Rule of Law indicator that shows the level of trust in the state when it comes to fulfilling contractual obligations, property rights, police and judiciary, as well as the degree of likelihood of crime and violence (World Bank WGI). The values of all three listed quality indicators of institutions range from 0 to 100, where 0 indicates the lowest and 100 the highest value.

The data on Serbian exports to the V4 countries are given for the period from 2000 to 2018 and are expressed in USD million at current prices. Given that, due to availability of the data, as a starting point for the analysis the year 2000was taken, and the analyzed period is 18 years, the total number of data pairs is 72. The data source for the value of GDP and population is the World Bank. The distance between Serbia and the V4 countries was taken as the distance between their capitals, the distance from Belgrade to Budapest, Bratislava, Prague and Warsaw. Data on selected quality indicators of institutions were also taken from the World Bank database Worldwide Governance Indicators for the period from 2000 to 2018.

5. Results

The PPML regression model was used to explain the volume of exports and the volume of imports between Serbia and the V4 countries. Expected results of the statistical analysis of the variable Y for Serbia and countries of the V4 group should have a positive value that is to be positively correlated with the bilateral trade. In contrast to the variable Y, it is expected that the distance between the two countries has negative effects on the volume and intensity of their mutual trade because of transport costs which are higher than the distance between two countries. The research also monitored the variables of whether there is a common language and whether Serbia has a bilateral agreement with the V4 countries. However, in this sample, these two variables are constants (Serbia does not have a common language with any of the sample countries, and a bilateral agreement is signed with all the V4 countries). Since the variance of these characteristics is equal to 0 and 1, respectively, these two variables are not included in the prediction model. Also, the impact of two other characteristics was observed: the indicator of inflow of investments larger than 100 million and the indicator of foreign direct investments. However, these two indicators have a value of 1 only with Hungary, and 0 with all other countries in the sample. This makes them completely equal to the direct neighbourhood indicator, so they are omitted in the final result, i.e. either of these two indicators can be inserted in place of the direct neighbourhood indicator Aij.

In the first model, as the dependent variable is the selected volume of imports into Serbia from the V4 countries. The GDP of the country of destination (logarithm value), the Serbian GDP (logarithm value), the distance between the capitals (logarithm value), an indicator of the direct neighbourhood of the two countries and an indicator of investment activity of the V4 countries in Serbia are taken as regressors, as well as institution quality indicators: Control of Corruption, Government Effectiveness and Rule of Law.

The results of the analysis are shown in the following table:

T a b l e 5

Results – Imports

Import	Estimate	Std. Error	z value	sig
(Intercept)	−15.233	3.718	−4.097	0.000
dist_log	−0.232	0.275	−0.842	0.400
lnGDPSrbija	0.980	0.171	5.740	0.000
lnGDPPartner	0.795	0.116	6.881	0.000
Borders	1.062	0.226	4.697	0.000
Control_of_Corruption	−0.016	0.011	−1.381	0.167
Government Effectiveness	0.067	0.025	2.721	0.007
Rule_of_Law	−0.020	0.011	−1.722	0.085

Source: Authors calculation.

Based on the obtained significance, it can be said that all the predictors have statistically significant predictive power, the best predictors are the GDP of Serbia and the GDP of partner countries. Revenues of Serbia and the V4 countries positively determine their bilateral trade, which confirms the positive values of the regression coefficient of the total GDP. The impact of distances between capitals on bilateral imports is negative and statistically significant, while the effect of common borders is significantly positive. This means that the greater the distance between the capitals, the smaller the volume of imports. On the other hand, the positive values of the neighbourhood indicators indicate an increased volume of bilateral imports between Serbia and those countries of the V4 group with which it shares a common border. The quality of institutions viewed through the indicators of control of corruption, government effectiveness and rule of law, as expected, has a positive impact on the volume and dynamics of imports, which is in line with the above statement that the higher quality of institutions can result in higher foreign trade (Yu, Beugelsdijk and De Haan, 2015, p. 110).

The coefficient values indicate the expected change in import volumes when changing the appropriate regressor for one unit in a situation when all other regressors remain unchanged. For example, if the value of the Serbian GDP changes by one unit, then the volume of imports into Serbia will increase by 0.98 million.

In the second model, the volume of exports from Serbia to the V4 countries was selected as the dependent variable.

In the second model, the volume of exports from Serbia to the Visegrad Agreement country was selected as the dependent variable. The GDP of the country of destination (logarithm value), the Serbian GDP (logarithm value), the distance between the capitals (logarithm value), an indicator of the direct neighbourhood of the two countries and an indicator of investment activity of the V4 countries in Serbia, as a perception about quality of institutions, are taken as regressors.

The results of the analysis are shown in the following table:

T a b l e 6

Results – Exports

Export	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	24.749	8.349	2.964	0.003
dist_log	−3.294	0.588	−5.604	0.000
lnGDPSrbija	−0.574	0.299	−1.916	0.055
lnGDPPartner	1.065	0.401	2.655	0.008
Borders	−1.842	0.550	−3.351	0.001
Control_of_Corruption	−0.074	0.035	−2.114	0.034
Government_Effectiveness	−0.085	0.063	−1.357	0.175
Rule_of_Law	0.097	0.023	4.218	0.000

Source: Authors calculation.

Based on the obtained significance, it can be said that all the predictors, except the neighbourhood indicators, have statistically significant predictive power, that the best predictor of GDP is Serbia, then the GDP of partner countries. Both predictors have a positive and significant impact. This means that the GDP growth of Serbia and the V4 countries is conditioned by a larger volume of their foreign trade, i.e. a bilateral export, which confirms the positive values of the regression coefficient of the total GDP. Also, higher bilateral exports have a positive effect on GDP growth in both Serbia and the V4 countries. As in the previous model, distance is a predictor with a negative statistically significant impact, and the neighbourhood indicator is a predictor with a positive and significant impact. This means that with the increase in distance, the volume of bilateral exports decreases and that the volume of exports will be higher between Serbia and those countries of the V4 group with which it shares a common border. Corruption, as expected, has a negative impact on bilateral exports, a higher corruption index may be a motive for reducing exports. The perception that the benefits of public authority are being used for private purposes may be a motive for reducing exports. In this regard, it is expected that, Control of corruption, Government Effectiveness and Rule of Law have a positive impact on bilateral exports. The security of trading partners in terms of the implementation of relevant laws, the quality of public service delivery and the independence of the civil service is an incentive to increase their bilateral trade.

The coefficient values indicate the expected change in export volumes when changing the appropriate regressor for one unit, in a situation when all other regressors remain unchanged. For example, if the value of the Serbian GDP changes by one unit, then the volume of exports from Serbia will increase by 1.065 million.

The analysis of economic relations between Serbia and the countries of the V4 group is not often a topic in the economic literature, and there are no significant results of econometric analyses with which to make a comparison. It is more common for the analysis of foreign trade or investment flows of these five countries to be viewed in the context of Serbia's economic relations with the European Union.

Conclusion

Economic cooperation between Serbia and the countries of V4 is observed through two aspects in this paper: bilateral trade flows and cooperation in the field of investments. Cooperation in the field of investments was analysed by using descriptive statistics without a more detailed econometric analysis. Out of

the observed member countries of the V4 group, Serbia has a significant inflow of investments only from Hungary, while the inflow from other countries is far below 100 million Euros per year. Hungary is present in Serbia in the oil industry, financial sector and the sector of production and exploitation of raw materials. Investments originating from the Czech Republic, Poland and Slovakia are present in Serbia, but in much lesser volume and value when compared to the investments from Hungary and other European Union countries. Cooperation in the field of investments could be more intensive in the future, given the potentials and business climate that Serbia can offer. The greatest interest in investing companies from the countries of the V4 group can be found in the field of agriculture, water management, energy, infrastructure building and production and processing of raw materials. Apropos Serbia's investments in the V4 countries, they are at a very low level, and such a trend should be expected in the future as well.

Serbia performs more than two thirds of its foreign trade transactions with the countries of the European Union, so from that point of view, the countries of the V4 group, as part of the EU, are of great importance to it. The most important foreign trade partner of Serbia among the countries of the V4 group is Hungary. In terms of exports, the Hungarian market is seventh in importance, while in terms of imports, it ranks fifth. The Czech Republic, Poland and Slovakia, as foreign trade partners, are ranked much lower, although in recent years Serbia has an ever greater volume of trade with them. None of the V4 countries recognizes Serbia as a significant partner in foreign trade relations. This is confirmed by the fact that Serbia is not on the list of the top fifteen trade partners for none of them.

The initial hypothesis in this paper, which states that the common cultural and historical heritage, geographical proximity of the market and common experience of the economic transition process can be an incentive for development and improvement of cooperation between Serbia and the V4 countries, was tested by using a PPML non-linear estimation model. The econometric analysis gave the expected results: GDP variables for Serbia and the V4 countries and the neighbourhood variable, i.e. the existence of a common border are positively correlated with their bilateral trade, while market distance has negative effects on the volume and intensity of their bilateral trade.

During the research, the characteristics of whether there is a common language and whether Serbia has signed a bilateral agreement were monitored. However, in this sample these two features are constants so these two variables are excluded from the prediction model. Instead of that, the model has been expanded with selected indicators of the quality of institutions in Serbia and the V4 countries: control of corruption, government effectiveness and the rule of law.

The econometric analysis of these indicators in the prediction model yielded the expected results, i.e. the impact of these three indicators is statistically signifi-cant and in a positive correlation with the volume of bilateral trade. The im-provement of trade relations and economic cooperation between Serbia and the V4 countries in the future should be viewed first in the context of political and economic relations that Serbia will have with the European Union, taking into account economic possibilities of Serbia to preserve negative consequences of the current economic crisis, to maintain economic stability and to improve export competitiveness.

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