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The effects of competing trade regimes on bilateral trade flows: case of Serbia[*,1]

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Abstract

The aim of this paper is to investigate the effects of competing trade regimes on Serbian trade with its most significant (traditional) partners, like European Union and CEFTA 2006 signatories, and other untraditional trade partners with favourable trade regime, like the USA. To this end, gravity model with bilateral and time effects is estimated by Hausman-Taylor AR(1) instrumental variable estimator, using panel data on bilateral trade between Serbia and its main trade partners during the period 2001-2010. The results indicate that overall level of development and difference in factor endowments stimulate Serbia's exports, which is in accordance with theoretical foundation that inter-industry trade is predominant in exports of less developed countries. Moreover, competing trade regimes appear as important determinant of Serbia's trade relations, whereas additional liberalization of trade regime with the USA as untraditional trade partner, even asymmetrical to Serbia's favour, cannot divert trade flows from traditional partners in the long-run. This could mean that distance plays more prominent role in bilateral trade than the degree of liberalization of trade regimes in case of Serbia. The result could be due to the contemporaneous effects of trade preferences granted to Serbia by the EU and other CEFTA 2006 signatories, main trading partners of Serbia.

Key words: *Trade regimes, gravity model, trade potentials, panel data*

JEL classification: *F13, F17, C33*

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1. Introduction

Trade between nations is often based on vast number of factors that defines which countries are traditional trade partners. Since trade is not liberal, trade regimes that define conditions under which trade is carried out have more influence on trade flows than other factors. Nowadays, there are numerous trade regimes defined at different levels of trade integration. But these trade regimes can often compete in attracting trade flows. This paper analyses the case of Serbian trade and competing trade regimes between Serbia and traditional partners (like the European Union (EU) and West Balkan countries[4]), and other trade partners with significantly liberalized trade regime (like the USA).

Serbia is a small European country still in transition to a full market economy. During the last decades, the trade of Serbia and its predecessor states was in great deal obstructed due to political unrest and economic sanctions that most important global trade powers exercised over Serbia. Trade of Serbia has still been at a very low level with goods exports below 12 billion USD in the last years with the lowest exports per capita of all the economies in the Western Balkans. Most dominant export products are commodities, products with low value added. The most significant trade partners of Serbia, on export side, are the EU countries, economies signatories of revised Central European Free Trade Agreement from 2006 (CEFTA 2006) and Russian Federation. Serbia's trade partners on imports side are similar, just Russian Federation takes second position and CEFTA 2006 partner economies third. The USA is important trade partner on import side and is in top 15 most important trade partners.

Concerning EU trade regime towards Serbia and other Western Balkans economies, in 2000, the EU adopted unilateral trade measures, Autonomous Trade Measures (ATM)[5], granting them tariff free and quota free access to EU single market to almost all export products from this region, except sugar, some meat products, fish and wine. The ATMs are nonreciprocal and asymmetrical in favour of Western Balkans not being obligated to reciprocate by granting trade preferences to the EU. Western Balkan economies want to integrate into the EU and the special process of accession has been designed for this region with Stabilisation and Association Agreements (SAA) as the main instrument. These agreements are different from the Europe agreement in the part where EU insists more on the fulfilment of certain political conditions but still the most important part of SAA is Trade Agreement. But SAA Trade Agreements introduce the trade reciprocity after the stipulated transitory period, and this means that the markets of Western Balkan economies

[4] These countries include: Albania, Bosnia and Herzegovina, Croatia, Montenegro, Macedonia, Serbia and Kosovo as a separate customs teritory under UNSCR 1244.

[5] EC 2007/2000/EC.

are also opening for the goods with EU origin but slowly since transitory period of usually 6 years is envisaged. Important stimulant is the introduction of the possibility of the cumulation of origin, regional and diagonal with the EU. For those West Balkan economies that have not yet signed SAA agreements with the EU the ATMs are still in force and can be applied up to 2015.[6]

Countries of the Western Balkans have liberalised their intraregional trade with adoption of CEFTA 2006 trade agreement. EU had initiated the Stability Pact for Southeast Europe in 1999, when Western Balkans economies signed a Memorandum on Trade Liberalisation. They negotiated 32 bilateral trade agreements between themselves which were in force from 2003. But the network of bilateral trade agreements was too complicated to administer so that in 2006 the Western Balkans economies decided to make single trade agreement under auspices of CEFTA. CEFTA 2006 is applied by contracting parties from 2007 and it created the free trade zone for industrial products fully completed by the end of 2010. The liberalisation in other areas like trade in agricultural products and services soon followed.

The relations between the USA and Serbia, two geographically distant countries, are longstanding and very dynamical. The regulation of mutual trade came as early as 1881 with signing a trade agreement. But the volume of trade between two nations was not significant until the period after the 1945 when Serbia was a part of Socialist Yugoslavia. Former Yugoslavia had very good political co-operation with the USA and the trade exchange amounted to one billion USD. But after the break up of Yugoslavia, political relations between the USA and Serbia were on a downturn and trade suffered. Due to the international sanction in 1990s trade was almost nonexistent. The next chapter in relations of the USA and Serbia came in 2000 when political relations between two countries improved. In 2003, the USA Administration decided to normalize trade relations concurrently with Serbia and Montenegro. This normalization meant that all the sanctions previously imposed to Serbia and Montenegro was lifted and Most Favoured Nation (MFN) trade regime was reinstated. Shortly in 2005 Serbia and Montenegro were put on the USA Generalized System of Preferences (GSP) list granting Serbia and Montenegro unilateral and asymmetric trade preferences in their favor.

The importance of trade regimes in determining bilateral trade between countries sometimes can surpass the effects of its standard factors (relative factor endowment, geographical proximity, etc). Considering all stated trade regimes relevant for Serbia's trade, this paper will try to answer to what extent competing trade regimes, at different levels of trade integration, influence bilateral trade of Serbia and its

6 Council Regulation (UE) N° 1336/2011 of 13 December 2011, Official Journal of the Ecs, L 347, 30.12.2011, p.1.

main trading partners. For that purpose, the gravity model of bilateral trade flows between Serbia and its trading partners is estimated for the period 2001-2010. To the best of our knowledge, the effects of different competing trade regimes in determining trade flows, and analysing trade diversion among them, have not been explored previously in the empirical literature, particularly ones focusing on the West Balkan region. Also, the gravity model literature which encompasses bilateral trade flows of the West Balkan region is very scarce, especially those involving Serbia. Therefore, apart from investigation of standard gravity model variables in determining Serbia's bilateral trade, our motivation is to analyse trade regimes effects setting up the following three hypotheses:

H_1: Overall GDP, similarity between countries and difference in factor endowments, as standard factors in bilateral trade analysis, have significant positive effects on Serbia's bilateral trade.

H_2: Liberal trade regimes play significant role in stimulating Serbia's bilateral trade flows.

H_3: Distance plays more prominent role in bilateral trade than the degree of liberalization of trade regimes in case of Serbia. In other words, more trade concessions to Serbia granted by distant (untraditional) trade partners, like the USA, cannot divert trade flows from traditional partners in the long-run.

The paper is organized as follows. After the Introduction, the Section 2 presents the empirical literature review. The methodology and data are explained in Section 3, while the Section 4 deals with the data analysis. Estimation results and discussion are contained in Section 5. The paper ends with conclusions containing the explanation of the working hypothesis and directions for the future research.

2. Literature review

The empirical literature on gravity model of international trade dates from the sixties of the previous century (Tinbergen, 1962; Linnemann, 1966). It explains the bilateral trade flows as increasing function of economic sizes of countries and decreasing function of the trade impediment, i.e distance between them. The model has become very popular after the break up of the Soviet Union, when it has been used to project the bilateral trade relations between new formed Central Eastern European countries (CEEC) and European Union countries (Hamilton and Winters 1992; Wang and Winters, 1992; Baldwin 1994; Brenton and Di Mauro, 1998). In order to examine where and to what extent bilateral trade might be re-directed, trade potentials were calculated mostly based on out-sample approach: (1) gravity model was estimated for the developed countries with a functioning

market economy (EU or OECD); (2) estimated regression coefficients were used to get estimated (potential) trade, i.e. to project „natural" trade relations between them and CEEC, and (3) based on the ratios between actual and potential trade, conclusions on unexhausted potentials and future expansion of trade were made.

In most of mentioned empirical literature, traditional specification of gravity model is used. The basic form of that specification relies on Newton's law of gravitation, explaining bilateral trade flows by "economic mass" of two countries (measured by their GDP and population) and the geographical distance between their economic centers. This specification is usually augmented by adding dummy variables, reflecting various trade promote factors and trade barriers (common border, common language, free trade area and currency union membership, customs regime of non-tariff trade barriers, etc.).

Despite the widespread empirical use of the gravity model, it has often been criticised due to the lack of its theoretical foundation. Hence, several theoretical developments have been made in support of empirical gravity model (for instance, Anderson, 1979; Bergstrand, 1985 and 1989; Deardorff, 1998; Evenett and Keller, 2002; Anderson and van Wincoop, 2003). It shows that gravity model can be derived from different theoretical models, such as Ricardian models, Heckscher-Ohlin (HO) models and increasing returns to scale models of the New trade theory. One of commonly used theory-based specifications of gravity model is the endowment-based new trade model, in line with Helpman (1987), where bilateral trade is determined by similarity in relative size of trading countries and differences in relative factor endowments.

Trade regimes are important factors that determines bilateral trade flows. These regimes define conditions upon which countries exchange goods and services. They are studied depending on a different level of trade integration. Most of the studies are devoted to exploring regional trade liberalisation. One of the first papers introduced the concepts of trade creation and trade diversion (Viner, 1950). Today the gravity model is often used to evaluate the effects of regional trade arrangements, currency union, economic integrations on bilateral trade flows (for instance, Brada and Mendez, 1985; Soloaga and Winters, 1999; Frankel and Rose, 2000; Nilsson, 2000; Micco et al., 2003; Faruqee, 2004; Papazoglou et al., 2006; Baier and Bergstrand, 2007; Marques, 2008). The most of studies conclude that regional trade agreements and economic integrations have strong positive effects on bilateral trade flows (e.g., Micco et al., 2003; Baier and Bergstrand, 2007; Bussiere et al., 2008). Other studies analise the effects of bilateral trade agreements or even international trade regime under auspucies WTO (Rose, 2004). But, our approach is new since we analyse trade diversion between different trade regimes, even regimes at different levels of integrations.

Parallel to the search of theoretical foundation for the gravity model, the econometric issue of the appropriate method of its estimation was also examined in the literature. The earlier analyses were focused on cross-section methodology (for instance, Wang and Winters, 1992; Egger, 2000). The estimation of gravity model was based either on cross-section data in a chosen year, or on averaged data over several years. However, the use of cross-sectional OLS estimation is misspecified and suffers from heterogeneity bias, since it ignores bilateral (exporter and importer) heterogeneity which are present in bilateral trade flows. Moreover, it is shown that the huge bilateral trade potentials found in many cross-section empirical studies are in fact the result of an econometrically misspecified model, regardless of whether in-sample and out-sample prediction concept is used (Egger, 2002). Therefore, most of recent studies are based on panel data econometric approach enable to control for bilateral heterogeneity by including country-pair (individual) effects. Various panel data specifications and estimation techniques are applied, such as fixed effects model (FEM), random effects model (REM), within-group estimator, random-effects generalised least squares (REGLS) method, Hausman-Taylor instrumental variable method, Poisson fixed effects method (Matyas, 1997; Cheng and Wall, 2005; Egger and Pfaffermayr, 2003; Serlenga and Shin, 2007; Silva and Tenereyro, 2006; Westerlund and Wilhelmsson, 2011).

Regardless of different panel econometric specifications used in gravity model literature, the assumption of uncorrelated bilateral (country-pair) effects with regressors is rejected in almost all empirical papers. The FEM estimation is often proposed as one of the most preferred method to avoid the potentially biased estimation (Cheng and Wall, 2005; Bussiere *et al.*, 2008). The reason for this is that bilateral effects account for unobserved time invariant factors (cultural, historical, political, etc.) thus leading to the deviation from bilateral "normal" propensity to trade, so that they can be controlled by including bilateral dummies in FEM. Moreover, FEM with country-pair specific (and time) effects is suggested when the idea is to predict trade potentials of one country or a set of non-randomly chosen countries (Bussiere *et al.* 2008). However, it is well known from the econometric literature that FEM does not allow the estimation of the effects of time-invariant variables (such as distance and common border) and several solutions to get their estimates are recommended in the literature. One of them is two-step FEM estimation suggested by Cheng and Wall (2005), and adopted in Bussiere *et al.* (2008), where the regression of within-group residuals averaged over time (obtained in the first step of FEM estimation) on time-invariant variables is employed in the second step. Another possibility to take account effects of time-invariant variables in the presence of singly exogenous regresors (correlated with bilateral effects) is to estimate RE specification of gravity model by using Hausman-Taylor instrumental variable method (with or without AR(1) error terms) which produces consistent and efficient estimates compared to FE estimates (Hausman and Taylor, 1981; Egger, 2002; Brun et al., 2005; Serlenga and Shin, 2007).

Regarding panel data estimation methods, it is worth noting that a number of papers consider a problem of the zero flows in trade matrix, and suggest different estimation methods, such as Poisson fixed effects estimator or Pseudo Poisson maximum likelihood method (Silva and Tenereyro, 2006; Westerlund and Wilhelmsson, 2011). Additionally, few papers considered non-stationarity issue in gravity models (for instance, Faruqee, 2004). However, Fidrmuc (2009) showed that dynamic ordinary least squares method (DOLS) applied on non-stationary variables produces almost the same results as fixed effects specification of gravity model with two step estimation procedure, concluding that "possible bias due to non-stationarity of gravity model is rather small".

The following sections deal with the investigation of the effects of competing trade regimes on Serbia's trade with its partners, based on the gravity model. In determining proper specification of the model as well as estimation method, we use the results from empirical literature mentioned above.

3. Methodology and data

In estimating gravity model of Serbian bilateral trade flows, we follow developments of the New trade theory adopted by Helpman (1987) and Egger (2002), described by the specification:

$$\ln X_{ijt} = \alpha + \beta_1 \ln TGDP_{ijt} + \beta_2 \ln SIM_{ijt} + \beta_3 RFE_{ijt} + \beta_4 \ln D_{ij} + \mu_{ij} + \lambda_t + u_{ijt} \qquad (1)$$

where X_{ijt} represents exports from country i into country j in the year t; $TGDP_{ijt}$, SIM_{ijt} and RFE_{ijt} are the overall GDP, similarity in country size and the difference in relative factor endowments between the exporter i and importer country j in the year t, respectively. These variables are formulated as follows:

(1) $TGDP_{ijt} = (GDP_{it} + GDP_{jt})$ represents the overall bilateral GDP of two countries, where GDP_{it} and GDP_{jt} are gross domestic product of exporter country i and importer country j in the year t, respectively.

(2) $SIM_{ijt} = (1 - (\frac{GDP_{it}}{GDP_{it} + GDP_{jt}})^2 + (\frac{GDP_{jt}}{GDP_{it} + GDP_{jt}})^2)$ reflects the similarity of countries in terms of their GDP. This index takes value from 0 (absolute divergence in size) to 0.5 (equal country size) and captures the intra-industry trade patterns between similar countries: the more similar two countries are, the higher the share of the intra-industry trade is.

(3) $RFE_{ijt} = \left| \ln \frac{GDP_{it}}{L_{it}} - \ln \frac{GDP_{jt}}{L_{jt}} \right|$ denotes the difference in relative factor endowments proxied by GDP per capita of countries i and j (L_{it} and L_{jt} are population in countries i and j in the year t), with minimum value of 0 for countries with identical relative factor endowments. The larger difference is, the lower the share of the intra-industry trade will be, and the higher the volume of inter-industry (and total) trade, as well.[7]

We start with model (1) in order to investigate theory-based determinants in explaining Serbia's bilateral trade. The theoretical and empirical literature show that higher level of overall GDP of two countries (*TGDP*) increases bilateral trade between them. Furthermore, more similar countries in terms of their GDP (*SIM*) tend to have higher intra-industry trade. Finally, according to the H-O-S trade model, international trade is explained by comparative advantages based on differences in relative factor endowments (*RFE*). On the other hand, according to Linder hypothesis, the larger bilateral trade between countries is stimulated by their similar tastes and income levels. Since Serbia is less developed country, the dominance of inter-industry trade in its trade relations is expected. Hence, an interesting issue is to test whether its bilateral exports, predominantly with developed EU countries, is based on comparative advantages resulting from differences in *RFE*, i.e. whether Linder hypothesis holds in case of Serbia's bilateral trade flows.

The effects of transport and transaction costs on trade are proxied by variable D_{ij}, i.e. by geographical distance between main economic centres of countries i and j. As can be seen from (1), a panel data approach is used in gravity model estimation in order to take into account unobserved heterogeneity across countries and hence to get more accurate results. This heterogeneity in panel data model (1) is encompassed by bilateral (country-pair) effects μ_{ij}. Time effects λ_t reflect business cycle effects or globalization process over the whole sample of countries, while u_{ijt} represents remainder error term. Traditional approach to estimate gravity equation consists of taking logs of both sides of (1) which leads to a log-log model.

The gravity model of Serbia's foreign trade is estimated based on export flows between Serbia and its main foreign trade partners for the period 2001-2010[8]. The

7 Recently, gravity model has been improved by including country-and-time fixed effects to control for unobservable multilateral resistance (for instance, Anderson and vanWincoop, 2003; Baier and Bergstrand, 2007). According to Anderson and van Wincoop (2003) bilateral trade is influenced not only by bilateral trade obstacles, but by their relative weight with respect to all other countries ("multilateral resistance").

8 EU-15 (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Netherland, Portugal, Spain, Sweden, United Kingdom), new EU members (Czech Republic, Slovak

chosen set of 36 countries covers approximately 95% of Serbia's total exports, and more than 90% of Serbia's total trade in observed period. Bilateral trade relations between Serbia and its trading partners are observed on the annual basis in the period from 2001 to 2010 (time dimension of panel dataset includes eleven years). To test our hypotheses on trade regimes effects, the specification (1) is augmented by several trade regime dummy variables, leading to the following panel data gravity model:

$$\ln X_{ijt} = \alpha + \beta_1 \ln TGDP_{ijt} + \beta_2 \ln SIM_{ijt} + \beta_3 RFE_{ijt} + \beta_4 \ln D_{ij} + \beta_5 Border_{ij} + \\ + \beta_6 EU_{ijt} + \beta_7 CEFTA_{ijt} + \beta_8 USA_{ijt} + \beta_9 USA05_{ijt} + \mu_{ij} + \lambda_t + u_{ijt} \quad (2)$$

Border is a dummy variable which takes value 1 for countries that share common border and 0 otherwise. To measure trade promoting effects relevant for Serbia, two additional dummy variables are included. Variable *EU* represents the effect of autonomous trade preferences unilateraly granted by the EU to Serbia, as one of the Western Balkan countries linked to the European Union's Stabilization and Association process. These preferences grant non-reciprocal duty-free access for almost all Serbia's export products to EU Single market. The variable takes value 1 for EU-15 from 2004, for new EU from 2005 - Czech, Slovak Republic, Poland, Hungary, Slovenia, Cyprus, from 2007- for Bulgaria and Romania, and 0 otherwise. Variable *CEFTA* measures the effect of revised Central European Free Trade Agreement from 2006 on Serbia's bilateral trade flows and takes value 1 from 2007 on, for Serbia's relations with Albania, FYR Macedonia, Bosnia and Herzegovina and Croatia, and 0 otherwise.

The effect of trade liberalisation between Serbia and the USA is encompassed by dummy variable *USA* which takes value 1 for the period after normalization of trade relations (after 2003), and 0 otherwise. Additional effect of including Serbia on the USA GSP list is covered by dummy variable *USA05* which takes value 1 for Serbian exports to the USA from 2005, and 0 otherwise.

The model (2) is estimated based on data from the following main sources. Data on bilateral export flows in current million USD are taken from the database of National Statistical Office of Serbia. GDP in current millions USD, GDP per capita in current USD and GDP deflator data (indices, 2005=100) are used from the IMF World Economic Outlook database in order to construct real GDP and GDP per capita variables. Data on population number is also obtained from the IMF World Economic Outlook database. The data source on geographical distance between economic centres of two countries is website: www.worldatlas.com. Trade regime

Republic, Poland, Hungary, Slovenia, Cyprus, Bulgaria, Romania), USA, Switzerland, Bosnia and Herzegovina, FYR Macedonia, Croatia, Albania, Russia, Ukraine, Turkey, China, Japan, Korea, Brazil.

dummy variables are created based on the information from European Commission website and according to the US State Department and US Trade Representative (http://www.ustr.gov).

Since the gravity model in this paper contains data on bilateral relations of individual country (Serbia), we follow suggestions from the literature and start with FEM as one of several specifications estimated in the paper. To estimate the effects of time-invariant variables, we apply two-step procedure of FEM estimation (Cheng and Wall 2005, Bussiere *et al.* 2008). In the first step, we estimate FEM and get all parameter estimates except those of time-invariant variables. In the second step, we estimate additional equation of within-group residuals (estimated in FEM, $\hat{d}_{ij}$) averaged over time, on all time-invariant regressors (Z_{kij}) to get their estimates:

$$\hat{d}_{ij} = \gamma_0 + \sum_{k=1}^{K} \gamma_k Z_{kij} + \mu_{ij} + \bar{e}_{ij} \tag{3}$$

As it is known from the econometric literature, FEM produces consistent estimates of regression parameters even in presence of singly exogenous regressors (correlated with the unobserved bilateral effects). However, the consistency of estimates of time-invariant variables in the second step (equation 3) depends on whether variables Z_{kij} are correlated with μ_{ij}. On the other hand, for the apropriate set of instrumental variables, Hausman-Taylor (HT) instrumental variables method, applied on REM, allows us to estimate the effects of time-invariant regressors. Contrary to simultaneous-equation literature where the problem is to find external instruments for the endogenour regressors, HT method, as instruments, includes all exogenous regressors from the model (i.e. their transformations). Namely, the first step in HT procedure is to identify the sets of: time-varying X_{1it} and time-invariant Z_{1i} variables – uncorrelated with individual effects μ_{ij}, as well as X_{2it} and Z_{2i} – correlated with μ_{ij}. Then, HT set of instruments contains deviations of X_{1it} and X_{2it} form their individual means, X_{1it} individual means and Z_{1i}, as instruments. If the number of exogenous time-varying variables X_{1it} is equal or greater than the number of endogenous Z_{2i} variables, HT estimator gives more efficient estimates compared to within-group FEM estimates. Therefore, to get consistent and efficient regression coeficient estimates of all variables in gravity model, we use both estimation techniques (FEM and HT) to test which is more appropriate in case of gravity model of Serbian foreign trade.

The use of all above considered estimation techniques requires the stationary property of all time- varying variables of gravity model. Therefore, in order to avoid the spurious regression problem, we first apply commonly used panel unit root tests: Levin, Lin and Chu (LLC), Im, Pesaran and Shin (IPS) test and Maddala-Wu Fisher-type tests (ADF-Fisher and PP-Fisher). The tests formulate the null hypothesis of the unit root. Regarding the alternative hypothesis, LLC test

assumes that all panels have the same autoregressive parameter (every series in the panel is stationary), while IPS and Fisher-type tests assume that each panel have its own autoregressive parameter (at least one fraction of the panel is stationary). These tests assume that there is no cross-sectional correlation in panels. Under this assumption, the IPS test is more powerful than the LL test, while the Fisher type tests generally performs better than both LLC and IPS tests.[9]

Apart from panel unit root tests, several other tests are applied in the process of appropriate specification selection. For instance, the significance of bilateral and time effects is tested by F test in FEM and Honda test in REM, while the singly exogeneity problem in REM is checked by Hausman misspecification test. Also, BFN Durbin-Watson test for FEM and Baltagi-Li tests for AR(1) and individual effects in case of REM are applied to test the autocorrelation problem. Finally, it is also worth mentioning that we use the dataset on export flows without zero values, and hence the issue on zero trade flows is not considered in the paper.

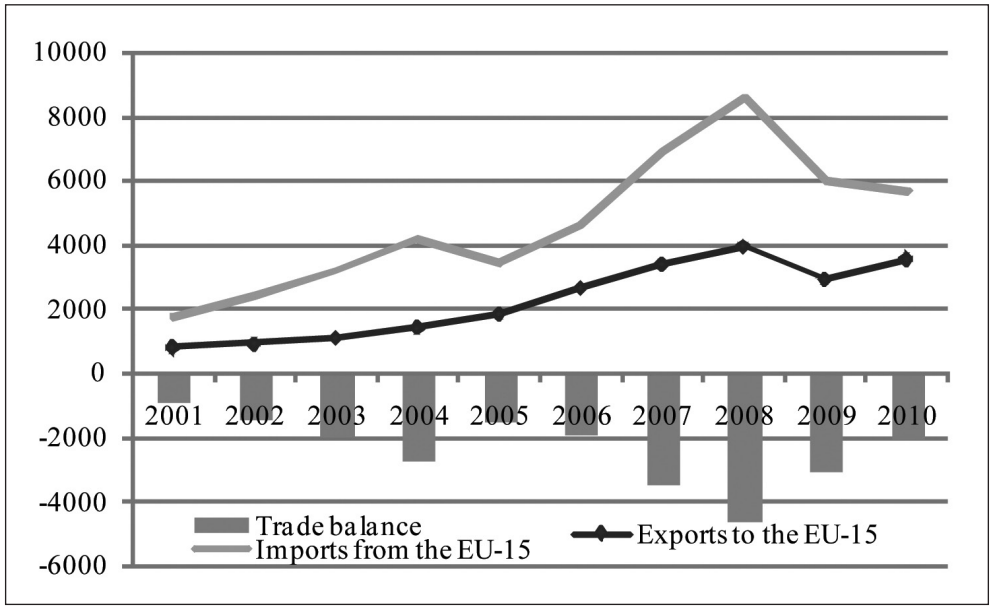
4. Data analysis

Serbia has been reappearing as a subject of international trade since 2000. Descriptive statistical analysis of Serbia's trade data shows that the most important trade partner of Serbia are 15 developed countries of the European Union (EU15) since more than half of Serbia's trade is with this countries. Trade relation with this trade block was obstructed by political factors until 2000 so exports of Serbia in 2001 were around 800 million USD. But then export started to rise significantly, especially after 2003 when Serbia started to benefit from ATMs granted by the EU. Problem in EU15-Serbia trade is permanent trade deficit on Serbia's side (Figure 1).

[9] All three tests show low power under the cross-sectional dependence, with the LLC and IPS tests perform even worse than Fisher type tests. Hence, when the cross-sectional dependence is obvious, the use of second generation panel unit root tests is required (e.g., Bai and Ng, Moon and Perron, Pesaran CADF test, etc.).

Figure 1: Serbia's trade with the EU15, 2001-2010

– in million USD



Source: Statistical Office of Serbia database

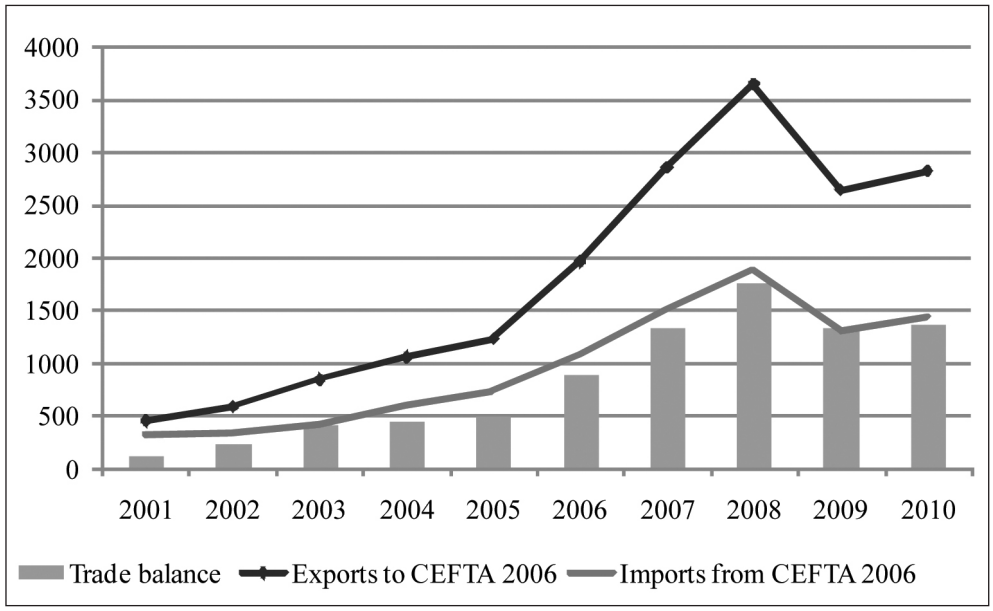
EU ATMs for Western Balkans are unilateral trade measures that grant Western Balkan economies tariff free and quota free access to EU single market to almost all export products from this region, except sugar, some meat products, fish and wine. This nonreciprocal and asymmetrical trade regime in favour of Western Balkans was adopted in 2000 but applied to Serbia from 2003. This was very favourable for Serbia's export to EU market since Serbia and its companies are significantly less competitive than companies operating in the EU. But with integration of Serbia into the EU, by signing Stabilisation and Association Agreements (SAA) that contains Trade Agreement, reciprocal trade regime will be introduced. There is an agreed transitory period of 6 years, so full free trade area with the EU will be established in 2014 when Serbia will lose asymmetrical trade concessions. This means that the markets of Western Balkan economies are also opening for the goods from EU and that local companies have to compete on a local market with EU companies. We already see that the imports to Serbia from the EU started to rise until the world economic crisis hit in 2009 when we see the sharp fall.

Other important trade partners of Serbia are its neighboring countries, mainly ex Yugoslav republics. But due to violent break-up of Former Yugoslavia in 1990s, the trade between Serbia and most of its neighbors was small and there was no trade regime to stimulate the trade exchange that used to be so vibrant in the past.

The exports of Serbia in CEFTA 2006 region in 2001 was only around 450 million USD. The trade regime between Western Balkan economies started to liberalize from 2000 on the EU initiative to stimulate regional co-operation. The system of bilateral trade agreements developed from 2000 was replaced by a single CEFTA 2006 agreement. This agreement introduced free trade area in trade in goods in the region, fully liberalized in 2010 with liberalization of trade in agricultural products and services in recent years. Even if this new CEFTA 2006 trade regime was reciprocal, Serbia as one of two most developed and competitive economies in the Western Balkan region increased its intraregional exports significantly, reaching the maximum in 2008 of 2.3 billion USD (Figure 2).

Figure 2: Serbia's trade with the CEFTA 2006 economies, 2001-2010

– in million USD*



* CEFTA 2006 trade data includes Serbia's trade with CEFTA 2006 signatories even before application of the agreement. Montenegro appears as a trade parter from 2006, since it was a member of joint state with Serbia before.

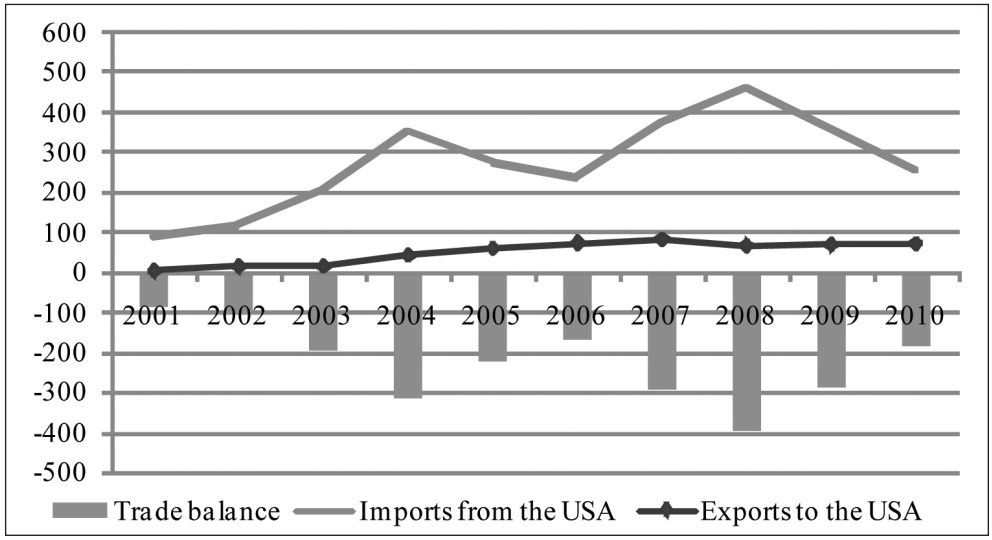
Source: Statistical Office of Serbia database

Other important partners of Serbia include Russia, Turkey, China and the USA. We choose the USA as untraditional partner for our analysis since it has extended asymmetrical trade regime to Serbia in the form of GSP treatment of products from Serbia destined for US market. Total trade between Serbia and the USA in 2000 was only 32 million USD, which is very low level of trade exchange. Resumption of Diplomatic Relations between the FRY and the USA came about on November

17th 2000 and this had immediate effect on trade exchange of two economies and total trade in 2001 reached almost 100 million USD, according to Serbian statistical office data. The political relations between FRY and the USA continued to improve and several important agreements were concluded[10]. The trade continued to rise in 2002 and 2003 between S&M[11] and the USA, but the worrying fact was that S&M recorded a permanent and rising deficit in its trade with the USA (Figure 3).

Figure 3: Serbia's trade with the USA, 2001-2010

– in million USD



Source: Statistical Office of Serbia database

The most important event in bilateral S&M – USA trade relations came in 2003 when the USA Administration decided to *normalize trade relations* with Serbia and Montenegro. The USA restored MNF regime in its trade with S&M and as a result average US tariff on goods imported from Serbia and Montenegro decreased from of 37% under the non-NTR tariff schedule, to the standard NTR rates which average was less than 3%[12]. This was the greatest stimulance to bilateral trade of two countries which as a result grew to 400 million USD in 2004. The decision

[10] Like the *Agreement between the Government of the United States of America and the Government of the Federal Republic of Yugoslavia Concerning Economic, Technical and Related Assistance* concluded on March 6th, 2001.

[11] In 2003 Federal Republic of Yugoslavia (FRY) was transformed by adoption of Constitutional charter into State Community of Serbia and Montenegro (S&M).

[12] News according to Embassy of Serbia and Montenegro in the US, Internet, www.serbiaembusa.org/newstext.php?subaction=showfull&id=1196956009&archive=&start_from=&ucat=19&.

of the USA Administration in 2003 to normalise trade relations with Serbia has caused significant increase both of exports and imports in the following period (for instance, in 2004 exports and imports growth rates were 166.2% and 69.9%, respectively). Even if trade between two economies was slightly reduced in 2005, the USA was rank as 5th most important trading partner in S&M imports. This is a first time that the USA has been in top 10 import partners of S&M.

But in 2005, even bigger boost to trade exchange between the USA and S&M came when the USA Government included S&M on the USA *Generalized System of Preferences* (GSP) list. The GSP trade benefits extended to developing countries beneficiaries of GSP treatment introduce even more favorable trade regime in trade relations between the USA and these countries than normal trade relations status (MFN regime). The conditions that countries had to fulfill in order to be put on the USA GSP list defined by the USA administration include, among others, having a market-oriented economy with fair and non-discriminatory international trade policies, protection of legal and property rights of US citizens and companies, efforts against international terrorism, enforcing international standards of rights for workers and protection of intellectual property rights (Bjelić, 2007).[13]

As a result of these new measures the export of Serbia to the USA did not started to rise significantly. The new regime in place in trade relations between S&M and the USA allow for most of the export products of Serbia to be exported to the USA duty-free. This had created large savings in the terms of less import duty paid to US Customs office, measured in thousands of USD. The treatment of Serbian export by the USA administration after 2005 was also favourable concerning the use of other trade measures. In September 2005, the USA Government introduced the suspension on importation of beluga sturgeon caviar and meat from Caspian Sea countries but Serbia was allowed to export its beluga caviar without restriction[14].

If we observe the exports and imports of Serbia to/from the selected trade partners in relative terms (Figure 4), we can perceive changes in shares of Serbia's trade with these partners in conjuction to relevant trade regimes. We can notice a fall in EU15 share in Serbia's export until 2003 when EU ATMs started to be applied and then the rise is noted. Also the CEFTA 2006 share in Serbia's exports are rising from 2005 when trade preferences were applied with this group of trade partners. The USA as a trade partner of Serbia on export side became relevant after 2003 when the share of export to the USA reached 1% of total exports in Serbia in the observed year. Serbia's exports rise in 2005 and then started to fall dramatically until 2008. In 2007, exports to the USA were again less than 1% of total Serbian exports. It seems that companies from Serbia were not able to use the preferences granted by the USA GSP regime.

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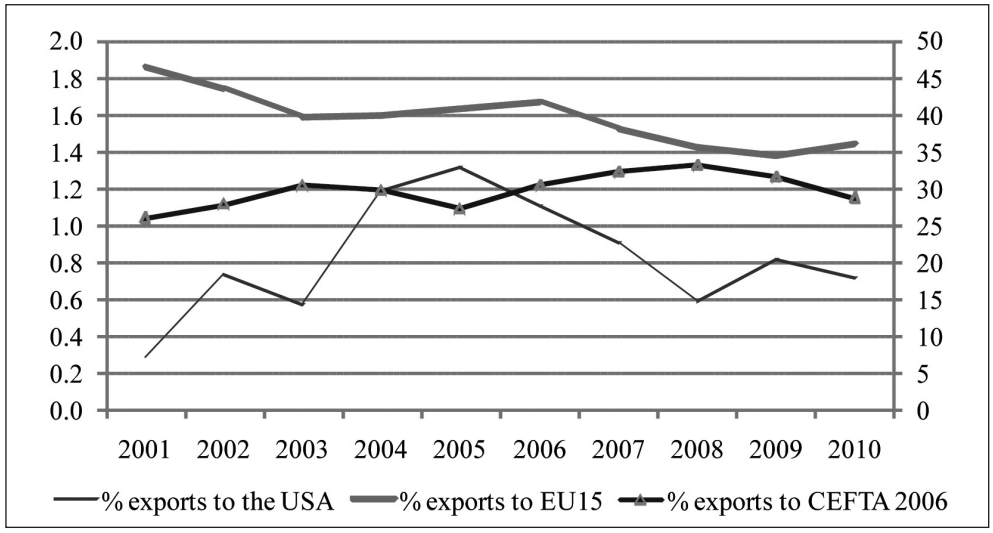
[13] These criteria for GSP eligibility are defined in US Trade Act of 1974.

[14] US Fish & Wildlife Service, Office of Law Enforcement, Notice to the Wildlife Import/Export Community, September 29th 2005, Internet, www.le.fws.gov/PBCaspianSea.htm.

Figure 4: The structure of Serbia's trade with selected partners (percentages), 2001-2010

(a) Serbia's exports to the USA, EU15 and CEFTA 2006

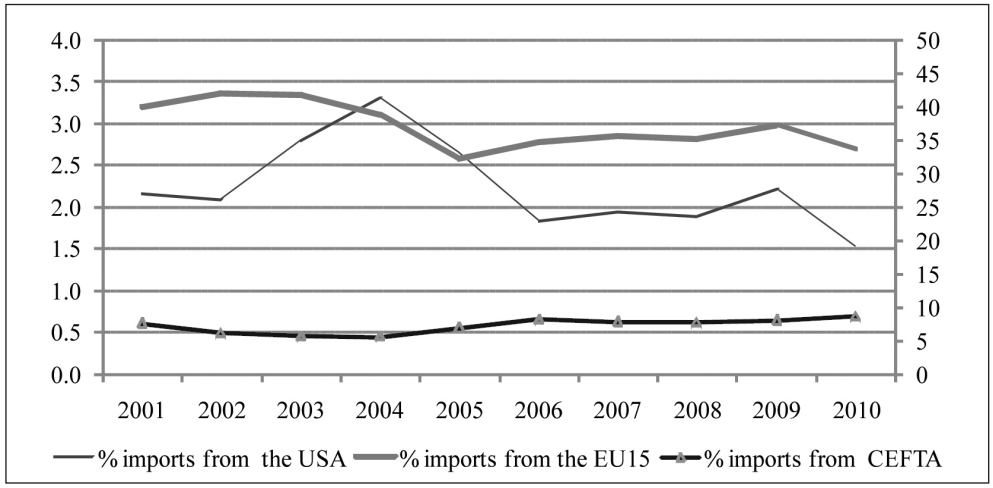
– % of total Serbian exports



Left scale: the share of exports to the USA; Right scale: the share of exports to EU15 and CEFTA 2006.

(b) Serbia's imports from the USA, EU15 and CEFTA 2006

– % of total Serbian imports



Left scale: the share of imports from the USA; Right scale: the share of imports from EU15 and CEFTA 2006.

Source: Statistical Office of Serbia database

On the imports side, EU15 have a fall in the share of Serbia's imports until 2005 when shares started to rise. In 2009 when trade preferences from SAA were applied and trade regime started to be symmetrical, we expected additional increase in EU15 share in Serbia's imports but this was not realised due to economic crisis. The Serbia's import from CEFTA 2006 was on the rise from 2006 what was effectuated in the rising share of this trade group. The imports of Serbia from the USA was on the rise until 2004 and from this year started to fall but was generally stabile around 2% of total Serbia's imports.

5. Results and discussion

In the first step of our econometric analysis, we apply panel unit root tests to check the stationarity issue of time-varying variables in the gravity model. All panel unit root tests reject the hypothesis of a unit root, implying that observed variables are stationary (Table 1). Hence, standard panel data estimation methods for stationary panels can be employed.[15]

Table 1: Panel unit root test results

Test	LLC	IPS W-statistics	ADF-Fisher	PP-Fisher
ln X_{ijt}	-13.5037***	-2.5264***	-2.7546***	-4.2659***
ln TGDP	-14.3523***	-2.7528***	-6.6844***	-5.0873***
ln SIM	-25.4835***	-1.9749**	-13.5042***	-6.2398***
RFE	-10.1491***	-11.8318***	-2.2087**	-40.6866***

Notes: ***statistical significance at the 1% level, **significance at the 5% level, *significance at the 10% level. Akaike information criterion (AIC) is used for optimal lag length to remove higher-order autoregressive components of the series. Deterministic components: individual effects included.

Source: Author's calculations

Gravity equation (2) is initially estimated both in the form of FEM and REM specification with bilateral (country-pair) and time effects (Table A1, Appendix). Time effects in both specifications are treated as fixed and encompassed by T-1 time dummy variables. Thus, these variables capture not only the overall globalization process, but also the effects of all unobserved time (individually-invariant) variables which are not explicitly included in the model. Both bilateral and time effects are statistically significant, which is confirmed by F test in FEM and Honda test in REM (Table A1, Appendix). This indicates that heterogeneity across country pairs and over time have to be accounted for.

[15] All estimation and testing procedures are conducted by using Stata/SE 11.2.

Additionally, Hausman test does not indicate singly exogeneity problem, i.e. correlation between some of regressors and unobserved bilateral effects, meaning that REM estimation by REGLS method could produce efficient estimates. However, this test may be inappropriate in presence of autocorrelated error terms, since it requires the use of efficient estimator under the null hypothesis. BFN Durbin-Watson test for FEM and Baltagi-Li tests for AR(1) tests indicate high autocorrelation of error term u_{ijt} (Table A1, Appendix). Hence, in the next step we estimate fixed and random effects models with AR(1) disturbance terms by applying Prais-Winsten transformation (Columns (1) and (2) in Table 2).

Table 2: The gravity model of Serbia's foreign trade

Variables	(1) FEM AR(1) Fixed country -pair and time effects[1)]	(2) REM AR(1) Country-pair effects and fixed time effects	(3) HT AR(1) Country -pair effects and fixed time effects
ln TGDP	0.761***	1.508***	0.777***
ln SIM	0.536	0.777*	0.349
RFE	0.289**	0.013	0.336***
ln D	-	-1.851***	-0.755***
Border	-	0.489	-0.168
EU	0.249***	0.183**	0.279***
CEFTA	0.231**	0.249*	0.255***
USA	0.582**	0.539**	0.623***
Constant	0.555***	10.386***	6.160***
R^2	0.68	0.64	0.73
No. observation	720	720	720
Hausman test		38.91 (0.004)	
HT over-identification test: $\chi^2_{(k1-1)}$[2)]			10.44 (0.7297)
Second step FEM estimation: dependent variable: country-pairs effects			
Constant	5.164***		
ln D	-0.704***		
Border	-0.131		
R^2	0.34		

Note: ***statistical significance at the 1% level, **significance at the 5% level, *significance at the 10% level (in parenthesis are *p* values).

[1)] T-1 fixed time dummies are included in all specifications of gravity model.

[2)] k_1 – number of doubly exogenous time-variant variables (uncorrelated with the unobserved bilateral effects).

Source: Authors' calculations

The estimation seems to increase the fit of the gravity model and lower the most of regression coefficients, compared to initial estimation results. Contrary to specifications in which autocorrelation problem is not taken into account, Hausman test now rejects null hypothesis of the absence of correlation between some of regressors and unobserved bilateral effects. This means that RE AR(1) estimates obtained by REGLS method (Column (2), Table 2) are biased, while FE AR(1) estimates remain consistent (Column (1), Table 2).

To estimate effects of time-invariant variables we first apply two step procedure, explained in previous section (the second step FEM estimation results are given in the last four rows of Table 2). Another way of getting these effects is to estimate HT AR(1) model. As mentioned earlier, if proper set of instruments exists, HT estimates are efficient compared to FEM. Therefore, we check whether FE AR(1) or HT AR(1) are more appropriate in gravity model of Serbia's trade. We estimate alternative HT AR(1) models with different sets of instruments[16] and apply Hausman-Taylor test for over-identifying restrictions. The test shows that the only appropriate is HT AR(1) model in which the distance variable is treated as singly exogenous, i.e. correlated with bilateral effects. In terms of regression parameters, this model seems to be close to FEM AR(1) but with efficient estimates.

According to the results of HT AR(1) model, main estimation findings can be summarized as follows. The effects of variables TGDP and SIM are positive, though the impact of SIM (similarity in relative size of trading countries) is found to be insignificant. Significant positive effect of TGDP variable supports the idea that the higher the overall size of two economies is the higher exports between countries will be. According to estimated coefficient, the increase of total size of two countries by 1% seems to increase bilateral exports by roughly 0.78% (this holds ceteris paribus, i.e. assuming other variables unchanged). The impact of difference in relative factor endowments (RFE) is significantly positive in case of Serbian foreign trade relations. The positive effect of capital-labor ratio differential implies that its 1% increase results in a 0.3% increase in bilateral exports. This is in line with theoretical foundations that more different countries in relative factor endowments are, the trade between them are likely to be higher (larger difference leads to higher volume of inter-industry (and total) trade and lower share of the intra-industry trade). These results prove our first hypothesis, that traditional factor in bilateral trade analysis have significant positive effects on Serbia's bilateral trade.

The sign and size of estimated coefficient for distance variable is consistent with the results from gravity model-based studies. The distance as important trade barrier has significantly negative impact on bilateral flows: the larger distance between Serbia and trade partner is, the lower exports will be. Distance is especially important factor

[16] In these specifications, we considered size related variables like TGDP and SIM, as well as distance and RFE variable as potential sources of correlation with bilateral effects.

in determining which trade partners are traditional and which untraditional. Trade theories suggest that less distant countries have more possibility in establishing trade between them and can be view as traditional trade partners. However, the effect of common border is not significant. The latter could be due to the fact that the most of countries that share common border with Serbia has already been captured by dummy variable CEFTA, implying that the two dummies may be compensated each other.

As can be seen from Table 2, regression coefficients of dummy variables *EU* and *CEFTA* are expectedly positive and significant in all specifications. These variables reflect factors that promote trade and indicate higher bilateral trade in the periods of trade liberalization between Serbia and observed countries. For instance, EU trade preferences granted to Serbia increases its exports by 32.2% {[exp(0.279)-1]*100}. Regression coefficient of *CEFTA* variable is 0.255, influencing the increase of Serbian trade by 29% above expected levels from the gravity model {[exp(0.255)-1]*100}. EU and CEFTA are traditional trade partners of Serbia and any facilitation of trade regime with these partners results in creation of additional export flows. This confirms our second hypothesis that liberal trade regimes play significant role in stimulating Serbia's bilateral trade flows. We can observe immediate effect of liberalisation of trade with all three partners from the date the trade agreement came into effect.

Regarding Serbia-USA trade relations the two dummy variables are initially included. The only significant variable refers to the effects of normalization of Serbia-USA trade relations after 2003 (*USA* dummy variable). According to the regression coefficient of that dummy variable, normalization of trade relations seems to increase of Serbian trade by 86.5% {[exp(0.623)-1]*100}. The other dummy variable (*USA05*), which is supposed to reflect additional GSP trade benefits from 2005, turns out to be insignificant in all specifications and consequently is dropped from the analysis. These results coincides with our third hypothesis that distance plays more prominent role in bilateral trade than the degree of liberalization of trade regimes. More trade concessions to Serbia granted by distant (untraditional) trade partners, like the USA, even asymmetrical to Serbia's favour (through GSP scheme), cannot stimulate significantly larger Serbian exports to the USA and cannot divert trade flows from traditional partners in the long-run.

Let look at this closer, observing calculated trade potentials between Serbia and the USA. For that purpose, we use gravity model estimates to compute exports predictions and compare them with the actual values, by calculating the ratio between actual (A) and predicted, i.e. potential (P) values. In other words, trade potentials are calculated based on their economic, geographic, historical and cultural characteristics (encompassed by gravity model).

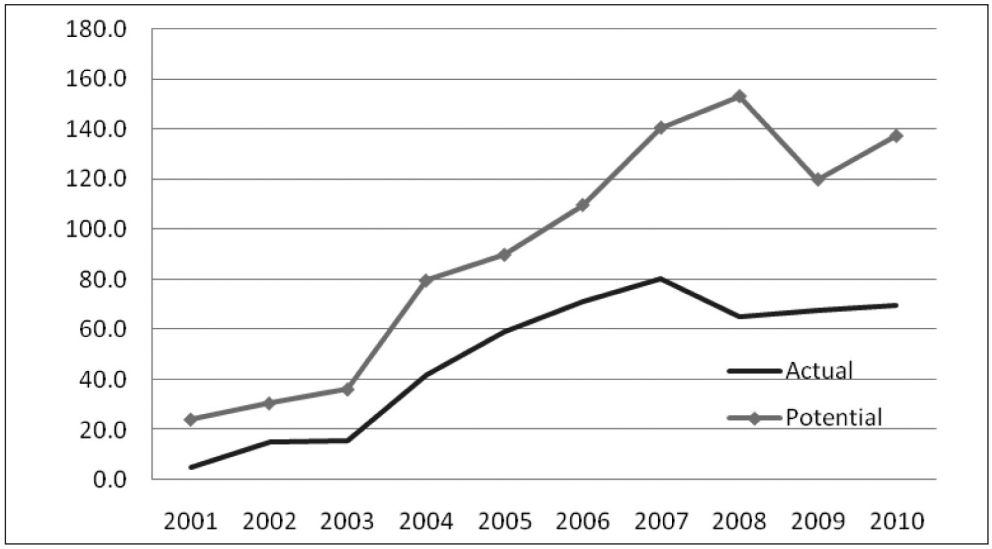
As it is known from the literature, calculated trade potentials (and A/P ratios) highly depend on estimation method (large differences between actual and predicted values may indicate model misspecification). Therefore, we analyse the dynamics of trade potential rather than its level in a chosen years, which is in line with our aim to

investigate the liberalisation effects on Serbia-USA export potentials. Figures 5(a) and 5(b) present actual and potential values as well as A/P ratio.

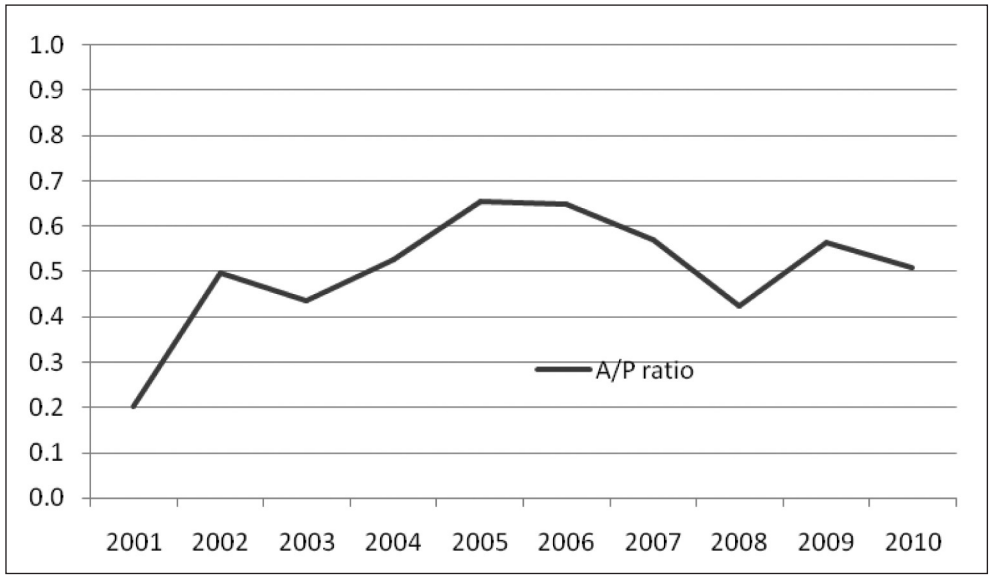
Figure 5: Serbian export potentials to the USA

(a) Actual and potential exports

– in million USD



(b) Actual-to-potential (A/P) ratio

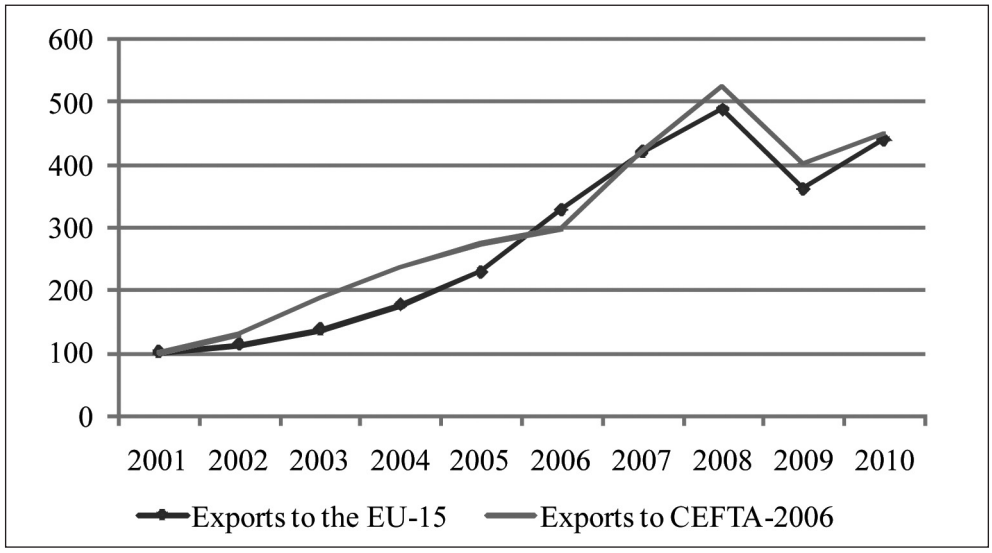


Source: Authors' calculations

As can be seen from the Figure 5(a), the years after 2003 are marked by progressive increase both in actual and potential exports from Serbia and the USA. This clearly shows that the Serbian export pattern is strongly influenced by economic and political stabilization in relations with the USA. The same is obvious from the Figure 5(b): actual-to-potential ratio is getting bigger, that is closer to 1. However, this tendency of actual-to-potential ratio is present up to 2006 when Serbia reached somewhat above 60% of its exports potential to the USA, indicating positive effects of normalization trade relations (MFN trade regime) on Serbian exports only in the short run. Even if Serbia has been put on US GSP list and granted more trade preferences, asymmetrical to its favour, we can observe that this did not help companies from Serbia to export to its full potential to the USA. The main reason that these added trade preferences granted by the USA did not boosted USA-Serbia trade could be parallel trade preferences granted to Serbia by its traditional trade partners. The EU ATMs came into effect in 2004 and trade preferences granted by CEFTA 2006 signatories in 2007. These trade preferences by traditional trade partners of Serbia divert its trade with the USA as untraditional partner. This diverting effects of competing trade regimes may also be found on the USA side since the USA signed a Central America Free Trade Agreement (CAFTA) with several countries in Central America that came into effect in 2006.[17]

Figure 6: Serbia's trade with the EU-15 and the CEFTA 2006

– indices (2001=100)



Source: Authors' calculations based on Statistical Office of Serbia data

[17] After the inclusion of Dominican Republic the Agreement is refered to as DR-CAFTA.

Finally, it is worth noting that global instability from 2008 in last years negatively affected Serbia-USA trade, thus influencing the widening the gap between actual and potential export flows, since the global economic crisis started in the USA and immediately resulted in fall in demand for import products. This is a factor that influenced the trade between Serbia and the EU15 and also its trade with CEFTA 2006 trade partners, but in less extent, as shown in Figure 6.

We cannot completely eliminate the political problems that resurfaced in USA - Serbia relations after the Kosovo's declaration of independence in 2008, that the USA supported. Prospects of Serbia - USA trade lies in specific products that the USA as untraditional partner cannot acquire in its neighbourhood and that are immune to high transportation costs.

6. Conclusion

The paper provides a panel data approach to competing trade regimes as an important determinant of bilateral trade between Serbia and its main trade partners. Three hypotheses have been tested. The first hypothesis that overall GDP and difference in factor endowments increases Serbia`s bilateral exports is confirmed. This is consistent with theoretical foundations that in less developed countries inter-industry trade is predominant and factors of production play significant role in exports. The second hypothesis that liberal trade regimes play significant role in stimulating Serbia's bilateral trade flows is also confirmed. Namely, the asymmetric trade preferences granted by the EU, as well as trade integration within CEFTA 2006, are positively associated with Serbia`s exports. And finally, our third hypothesis that geographical proximity plays more prominent role in bilateral trade than the degree of liberalization of trade regimes in case of Serbia is confirmed, too. Our analysis shows that trade concessions to Serbia granted by the USA cannot divert trade flows from traditional partners in the long-run.

World trade today is not completely liberal so the principles of classical trade theories do not apply to a full extent on practice of international trade. Trade regimes set the conditions for foreign trade between countries and sometime can have greater significance in directing trade than basic factors of trade, like distance, factor endowment etc. The empirical novelty of this paper is that it encompasses effects of several trade regimes at different levels of trade integration on bilateral trade. In this regard, our gravity model augmented by trade regime variables could be relevant tool for the analysis of very important determinants of bilateral trade. The paper results represent a contribution to the empirical literature about the impact of trade regimes on bilateral trade through gravity model estimation, which is rather scarce, especially in case of West Balkan countries.

Research limitation might be that the analysis in the paper is based on a single country case, but it can be expanded to analyze the diverting effects of competing trade regimes of all Western Balkan economies. Therefore, our future investigation could be oriented to the effects of different trade regimes on bilateral trade of all countries of the West Balkans. Another direction for further research could be to deepen the analysis of the Serbian case by observing whether difference in symmetric and asymmetric trade concession play a significant role in Serbia's trade with its most prominent trade partners, in correlation with global competitiveness score of Serbia and its partners.

The findings of analysis in this paper are useful guidelines for foreign trade policy creation and execution in Serbia. It is important to regulate trade regime with important and traditional partner while putting efforts in regulation trade relations with untraditional (distant) trade partners cannot boost trade with them. For Serbia it would be better to become a member in World Trade Organization and regulate market access to untraditional partners' markets through this multilateral trade regime.

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Efekti konkurentnih trgovinskih režima na bilateralne tokove trgovine: slučaj Srbije[1]

Predrag Bjelić[2], Radmila Dragutinović Mitrović[3]

Sažetak

Ovaj rad ima za cilj istražiti efekte konkurentnih trgovinskih režima na primjeru trgovine Srbije s njenim najznačajnijim (tradicionalnim) vanjskotrgovinskim partnerima, kao što su Europska unija i potpisnice CEFTA 2006 sporazuma, ali i s netradicionalnim partnerima s kojima ima povoljan trgovinski režim, kao što su SAD. U ovom cilju primijenili smo gravitacijski model s panel podacima s bilateralnim i vremenskim efektima od 2001. do 2010., a ocijenili smo ga Hausman-Taylor metodom instrumentalnih varijabli. Rezultati naše analize podupiru hipotezu da opći nivo razvijenosti i razlika u faktorskoj raspoloživosti stimuliraju izvoz Srbije, što je sukladno teorijskim postavkama da interindustrijska trgovina dominira u izvozu manje razvijenih zemalja. Također, trgovinski režimi su značajna determinanta vanjskotrgovinskih odnosa Srbije, ali dodatna liberalizacija trgovinskog režima sa SAD, kao netradicionalnim partnerom Srbije, iako asimetrična u korist Srbije, ne može skrenuti trgovinske tokove od tradicionalnih vanjskotrgovinskih partnera Srbije na dugi rok. Ovo nam govori da razdaljina igra značajniju ulogu u bilateralnoj trgovini nego li stupanj liberaliziranosti trgovinskog režima, u slučaju Srbije. Najznačajniji režimi koji odvlače usmjerenost od razmjene sa SAD su trgovinski preferencijali istodobno odobreni od Europske unije i potpisnica CEFTA 2006 sporazuma.

JEL klasifikacija: *F13, F17, C33*

Ključne riječi: *vanjskotrgovinski režimi, gravitacijski model, trgovinski potencijali, panel podaci*

[1] Ovaj rad rezultat je znanstvenog projekta Ekonomskog fakulteta Sveučilišta u Beogradu, a provodi se uz financijsku potporu Ministarstva prosvete, nauke i tehnološkog razvoja Republike Srbije.

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Appendix

Table A1: Two-way fixed effects model and random effects model

Variables	(1) FEM Country –pairs and time effects[1)]	(2) REM Country-pairs and time effects
ln TGDP	1.618***	1.689***
ln SIM	1.114*	0.990**
RFE	0.382**	0.101
ln D	-	-1.814***
Border	-	0.750
EU	0.339**	0.279**
CEFTA	0.225**	0.300*
USA	0.658**	0.577**
Constant	-3.519***	9.496***
R^2	0.66	0.65
F test of individual effects:	71.46 (0.000)	
F test of time effects	11.34 (0.000)	108.33 (0.000)
Honda one sided test for random individual effects		46.807 (0.000)
Hausman test		17.68 (0.169)
Modified BFN-Durbin Watson test	0.8981	
Baltagi-Li LM test for serial correlation		758.69 (0.000)
Baltagi-Li LM joint test (for individual effects and serial correlation)		2245.58 (0.000)
Second step FEM estimation: Dependent variable: Country-pairs effects		
ln D	-1.488***	
Border	0.586***	
Constant	10.739	
R^2	0.47	

Note: ***statistical significance at the 1% level, **significance at the 5% level, *significance at the 10% level (in parenthesis are *p* values). [1)] T-1 fixed time dummies are included in all specifications of gravity model.

Source: Authors' calculations