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FREE TRADE AGREEMENTS AND TRADE INTEGRATION AMONG SOUTH EASTERN EUROPEAN COUNTRIES: GRAVITY MODEL ESTIMATIONS

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The views expressed here are those of the author and do not necessarily reflect the views of the Bank of Albania.

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ABSTRACT

This paper evaluates trade flows among SEE-9 countries by including dynamics into a panel data gravity model. The GMM approach seems to be the right econometrical model in allowing dynamics into the gravity models for trade. The model produced robust outcomes (in terms of statistical diagnostics) underlying that actual trade is affected by previous (lagged) trade flows. In accordance with the literature on gravity models for trade, the paper finds out that trade is positively influenced by GDP, FTAs, Colonial links and Contiguity. Trade flows are found to be negatively affected by the physical transportation distance between countries. FTAs are found to have positively contributed to the regional trade integration. However, the findings suggest that most SEE-9 countries trade below their potentials.

JEL Classification: C13, C23, F10

Keywords: Dynamics, gravity model, trade integration, regional integration, SEE-9, trade potentials, GMM model, Free trade agreements (FTAs), trade flows

1. INTRODUCTION

During the 90s, the Balkan region was characterized by political and economic instability, armed and ethnical conflicts, "Ponzi" schemes, transitory governments, federation breakdowns (the break of Former Yugoslavia), new country formations etc. The above characteristics have had considerable impact on each specific Balkan country. Countries of South Eastern Europe (SEE countries) nowadays are at different stages of development and integration with the European Union. However, almost all of them have a clear European Union aspiration and some of these countries are already part of the EU (Bulgaria, Romania and Slovenia). The Stabilization and Association Process (SAP) is the European Union's policy towards the Western Balkans, established with the aim of European integration. Countries of South Eastern Europe (especially Western Balkan countries) are concerned in a progressive partnership with a view to stabilizing the region and the eventual establishment of a free-trade area" (Stability Pact for SEE 2005). The economic aim of the Stabilization and Association Process is to set out common economic goals. In other words, this process aims to create a regional free trade area, which is also well integrated financially, politically and institutionally.

As explained earlier, part of the Stabilization and Association Process is the establishment of a free trade area among SEE countries. As a result, almost all Balkan countries have signed bilateral Free Trade Agreements (FTAs) among them[1]. Most of these FTAs were signed during the early 2000s. However, to what extent

[1] Kosovo had an interim arrangement with Macedonia, which followed on from the agreement with Serbia and Montenegro (these agreements are not fully free trade agreements, as some specific products are subject to border taxes according to the specific agreements). Kosovo has already signed free trade agreements with the following regional countries: Republic of Albania (since 01.10.2003); Republic of Macedonia (since 03.08.2005); Republic of Croatia (since 01.11.2006); and with the Republic of Bosnia and Herzegovina (since 12.12.2006).
It is worth emphasizing that Free Trade Agreements with Albania and Bosnia & Herzegovina are completely free for all products from agricultural products (chapter 1-24) to industrial products (chapter 25-97). While the FTAs with Macedonia and Croatia do have some limitations on some certain products imported from these two countries, as per products of Kosovo origin, there are no limitations during the export to these two countries, which means the goods are exempt from customs charges". For more details see http://www.ceftatradeportal.com

have these bilateral FTAs achieved their objective? Has bilateral trade increased ever since? Are Balkan countries economically (in trade terms) integrated? Is there an opportunity for further trade intensification among SEE countries?

The intended contribution of this discussion paper is thus to assess the situation of trade flows among SEE countries, and evaluate whether or not the signed free trade agreements have affected trade flows among SEE countries. To achieve this, the paper will use the gravity model approach, which is nowadays one of the most commonly used empirical models in evaluating international trade.

Scholars from the field of economic integration suggest that there are enough economic argumentations emphasizing that current trade might be influenced by previous trade. For instance, several authors argue that lagged trade influences current trade through the "habit formation" concept. In other words, if customers have been using a specific product during the past years, they will get accustomed to that product. This "habit formation" would contribute to current and future trade (Eichengreen and Irwin 1997; Bun and Klaassen 2002). The above arguments suggest that trade flows in the past do affect current and future trade flows. However, most studies in the past use the static OLS gravity model approach, which disregards the importance of such dynamics in explaining trade flows.

Literature on trade integration in the Balkan region is rather limited and insufficient. On the other hand, dynamics in gravity models remain still an unexplored field in econometrics. Thus, the intended aims of this discussion paper are to contribute both the literature on trade integration of the SEE region as well as to the econometric literature on the importance of dynamics in gravity models for trade.

Trade flows among nine South Eastern European countries (SEE-9) would be the main focus of this paper. The specific countries that will be evaluated in the paper are as follows: Albania, Bosnia & Herzegovina, Bulgaria, Croatia, Macedonia, Romania, Serbia

& Montenegro[2], Slovenia and Turkey. Even though Kosovo[3] is an important trading partner for several SEE-9 countries, it is not included in the gravity estimations due to insufficient data. This paper uses a panel data set of N = 792 annual bilateral trade flows (observations), from United Nations Commodity Trade Statistics Database (UN comtrade), among the SEE-9 countries over a period of T = 11 years (from 2000 until 2010).

The paper uses the gravity model by Frankel, Stein and Wei (1997) as a base model to then build up a new fully specified econometrical model that allows dynamics in explaining trade flows. The paper uses the GMM estimation approach in allowing such dynamics into the gravity model estimation.

The structure of this paper is as follows. Section 2 analyzes the characteristics of trade flows in SEE-9 countries. Section 3 offers a literature review on gravity models, panel data, dynamics and GMM estimation. This section also argues the econometrical and theoretical rationale in developing the dynamic model. Section 4 offers a description of the data, discusses the model results and treats possible implementations. Section 5 concludes.

[2] Even though Serbia and Montenegro are two independent countries since June 2006, in this material they are as a single country (due to data management reasons) and their trade flows are augmented.

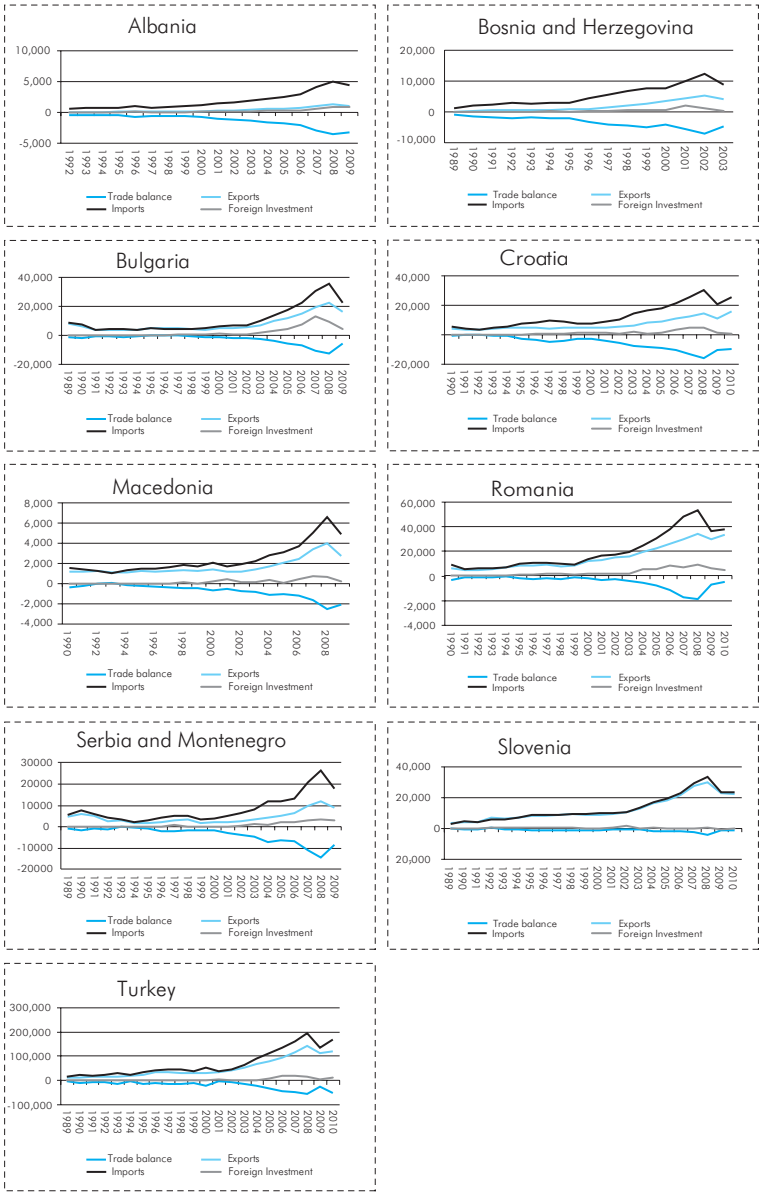
[3] Kosovo declared its independence in February 2008. Data on Kosovo's trade flows are insufficient.

2. TRADE CHARACTERISTICS OF SEE-9 COUNTRIES

The analysis of the features and trade characteristics of SEE countries would contribute to establishing a clearer view on regional trade. The graphical representations in Chart 1 show several trade characteristics (trade balance, exports, imports and foreign investments) of SEE-9 individual countries. When analyzing the individual graphs in Chart 1, the most evident common trade characteristic among SEE-9 countries is that almost all of them are import oriented. Apart from Slovenia, almost all other countries are characterized by a negative trade balance. It seems that domestic consumption in regional countries cannot be fulfilled by domestic production, leading thus to import oriented economies.

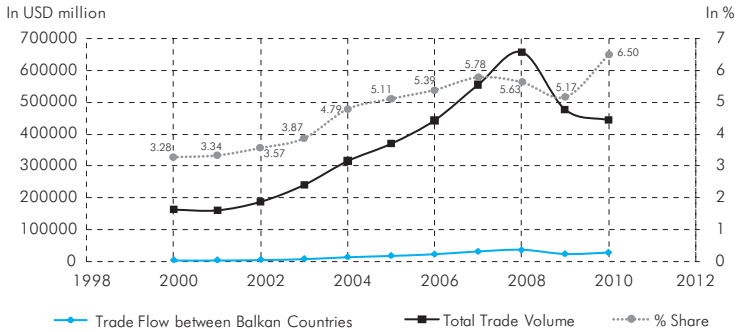
However, trade volumes have grown continuously in SEE-9, especially after 2002. For instance, Chart 2 shows that trade volumes of SEE-9 countries have more than tripled from 2002 to 2008 (the black line in Chart 2). In addition, trade volumes among SEE-9 countries have jumped from 6720 million US$ in 2002 to 28913 million US$ in 2010 (the corresponding values of the blue line in Chart 2). Within eight years, trade volumes among SEE-9 countries have grown by more than 400%. The trade boom in SEE-9 countries after 2002 corresponds to the bilateral Free Trade Agreements signed among SEE-9 countries (the majority of FTAs among SEE-9 countries took place between 2000 and 2004). The dotted grey line in Chart 2 shows the percentage share of total trade flows among SEE-9/total trade volumes of SEE-9. In 2010, trade flows among SEE-9 countries accounted for only 6.5% of total trade volumes of SEE-9

Chart 1 Trade characteristics of SEE countries (in million US$)



Source: European Bank for Reconstructions and Development (EBRD)

Chart 2 Share of total trade to total trade volume in SEE-9 countries



Source: Author's own calculations using data from UNcomtrade, and EBRD
The % share of total trade flows among SEE-9/total trade volumes: right hand side axis).

It is clear that trade among SEE-9 is only a small portion of total trade volumes of SEE-9. However, can SEE-9 countries intensify trade volumes among them? Is there room for trade intensification? Have bilateral FTAs among SEE-9 contributed to the trade intensification among SEE-9 countries during the period 2002-10? Next section introduces the gravity model for trade. A fully specified dynamic model will be developed in trying to answer the above questions.

3. EMPIRICAL MODELING ON TRADE INTEGRATION

3.1 GRAVITY MODELS

The application of the gravity model in examining international trade has become a common practice. This empirical model emerged during the early 60s endorsed by Linder (1961), Tinberben (1962) and Linnemann (1966). The gravity model for trade adopts concepts from the gravity theory in physics[4], in expressing bilateral trade. Trade flows among two countries are considered to be positively related to their economic size (size/mass attraction) and negatively related to the physical distance of their main economic centers (pushed by the physical distance). The basic gravity model has been enriched over time with several other explanatory variables such as population size, common language dummies, cultural similarities indicators etc. Adding up, the gravity model has also gained economic theoretical support by numerous authors (Anderson 1978; Bergstard 1985; Helpman 1987; Deardorff 1998). The rising reputation of the gravity model may be attributed to numerous factors. Perhaps, the most important contributors are its success in the empirical applications and its continuous and adequate development over time.

Gravity models for trade have been typically estimated using a cross-section OLS approach. However, most authors nowadays use panel data techniques in estimating gravity models. The panel data approach offers several advantages compared to the cross-section OLS model. For instance, panel data approach permits the incorporation of additional time series observations, which results in more precise educated guess. In addition, by using panel data one can have better control over unobserved country-pair particular time invariant determinants of trade, usually captured by the disturbance term in a cross-section approach (Bun and Klaassen 2002).

[4] This theory in physics explains the gravity force among two bodies, as directly proportional to their mass and inversely proportional to the distance between them. (Isaac Newton, 1666)

Most authors from the field of international trade integration use a static panel model in evaluating trade with gravity models, disregarding as such the importance of dynamics in bilateral trade. In theoretical terms, there are good economic reasons to assume that actual bilateral trade flows are affected by lagged bilateral trade (dynamics). For instance, if a home-based company has been exporting its products to a partner country, it has also set up its distribution and service networks in the partner country. It is thus easier (cheaper) for this company to continue trading its products in the partner country, rather than a new company entering the market, due to entry exit cost.

Another important rationale why lagged trade is believed to affect current trade is because consumers in the partner country have been accustomed to home countries' products – "habit formation" as explained in the introduction. This suggests that current bilateral trade will be influenced by previous trade flows among the two partner countries (Eichengreen and Irwin 1997; Bun and Klaassen 2002).

In addition, trade phenomena such as trade partnerships and trade preferences have led to Customs Unions, Free Trade Agreements and knock-on effects on future trade flows (Krugman, 1993; Baldwin, 1996; Harris et al. 2008).

To sum up the above argumentations, we could say that lagged trade affects current and future trade. Paying no attention to this may lead to misleading outcomes. Recent authors also underline that including dynamics into gravity models for trade is both econometrically and theoretically important (De Grauwe and Skudelney, 2000; Bun and Klaassen, 2002; Harris et al. 2008). For these reasons, lagged trade is incorporated into the final equation (3) as an explanatory variable (fully explained in section 3.3).

3.2 DEVELOPING A MODEL WITH BASE SPECIFICATIONS

The basic gravity model explains trade flows among two countries *i* and *j* (the dependent variable) as a function of two main components; the economic sizes of the two countries (explanatory variable) and the distance in kilometers between their economic centers (explanatory variables). Frankel, Stein and Wei (1997) undertake a comprehensive and convincing study to measure the effects of bilateral and multilateral trade arrangements. This paper uses Frankel, Stein and Wei (1997) gravity model as a base model to then develop a new econometrical model that allows dynamics in explaining trade flows. Frankel, Stein and Wei (1997) use a static cross-sectional OLS model to evaluate the effects of different free trade agreements. Their model could be written as follows:

$$\log Trade_{ijt} = a_0 + a_1 \log(GDP_{it} * GDP_{jt}) + a_2 \log(GDPPC_{it} * GDPPC_{jt}) + a_3 \log(Distance_{ij}) \quad (1)$$

where: the variable to be explained is $Trade_{ijt}$, the logarithm of real bilateral trade flows between countries *i* and *j* in year *t*. (i, j = 1,...., N, $i \neq j$, t= 1,..., T). Whereas the explanatory variables are: GDP stands for Gross Domestic Product (the economic size of the two countries), GDPPC stands for the Gross Domestic Product per Capita (income), Distanceij denotes the distance in kilometers between the economic city – centers of trading partners. The distance variable is assumed to proxy the transportation cost between the trading partners. a_0 is a constant; a_1, a_2 and a_3 are the coefficients to be evaluated. Trade, GDP, GDPPC and Distance are expressed in natural logarithm terms.

The previously explained gravity model is designed to be applied in a cross-sectional OLS model. In order to better evaluate trade developments, given the characteristics of the SEE-9 countries, this material uses a panel data approach. By using a panel data model one can better manage the effects of time invariant explanatory variables such as distance and common border dummies. To better capture these effects, an additional dummy variable is added to the above model (a common border dummy variable). As mentioned

earlier, one of the main intentions of this paper is to evaluate the effects of bilateral FTAs on trade flows among SEE-9 countries. As a result, an extra FTA dummy variable is added to the model. Some of the countries in the focus of this paper (Bosnia & Herzegovina, Croatia, Serbia & Montenegro and Slovenia) have been part of the same administrative territory during the past 50 years (former Yugoslavia). This characteristic would be specified in the model by colonial link dummy variable. Apart from the above mentioned dummy variable, other studies suggest several other dummy variables that might affect trade flows among two countries: armed conflicts (wars), currency unions, exchange rate (Vika, 2006) or common language dummies and CIF/FOB ratio. However, taking into consideration the characteristics of the SEE-9 countries, it is believed that the above mentioned dummy variables are rightly set for this specific model[5].

The resulting model would be:

$$\log Trade_{ijt} = a_0 + a_1 \log(GDP_{it} * GDP_{jt}) + a_2 \log(GDPPC_{it} * GDPPC_{jt}) + a_3 \log(Distance_{ij}) + a_4(FTA_{ij}) + a_5(ColonLink_{ij}) + a_6(Contig_{ij}) + \upsilon_{ijt} \quad (2)$$

where: FTA is the dummy variable standing for Free Trade Agreements (FTA = 1 if between countries *i* and *j* exists a free trade agreement and FTA = 0 if otherwise), ColonLink is the dummy variable colonial links (ColonLink = 1 if countries *i* and *j* were part of the same territory during the past 50 years and ColonLink = 0 if otherwise), Contig is the dummy variable standing for the contiguity (Contig = 1 if countries i and j share a common border and Contig = 0 if otherwise), υ_{ijt} is the disturbance term.

As stated earlier, there are strong economic arguments to suggest that current trade flows could be explained by lagged GDP and lagged trade. To allow for such dynamics, the paper adopts the Generalized Method of Moments (GMM) estimation method. Bun and Klaassen, (2002) and Harris et al. (2008) take a similar approach (using GMM in allowing dynamics into the gravity model for trade). The following section specifies the dynamic model and explains the main econometric options faced during the data investigations that lead the author to such a choice.

[5] There exists no currency union among SEE-9 countries so far.

3.3 INTRODUCING DYNAMICS TO THE GRAVITY MODEL

There are several econometric arguments in favor of the GMM approach instead of the OLS static model.

The typical problem faced when including dynamics into the static panel OLS estimation models is the dynamic panel bias, which leads to model misspecification, preventing the opportunity to study the effects of dynamics (Bond, 2002; Baum, 2006; Balgtagi, 2008; Efendic et al. 2009). Such models are considered to be misspecified, as they ignore the whole history of the explanatory variables (the right hand-side variables) (Bond, 2002; Greene, 2008; Efendic et al, 2009). The data for this panel estimation have the following characteristics: there are N = 792 annual bilateral UNCOMTRADE trade flows between SEE-9 countries over a period of T = 11 years (2000-10). Literature on dynamic panel data suggest that GMM models are specially designed and more consistent in cases where T is smaller than N. The GMM approach allows the control of the so-called dynamic panel bias (Arellano and Bond, 1991; Blundell and Bond, 1998; Bond, 2002; Baum, 2006; Roodman, 2007; Balgati, 2008; Efendic et al, 2009).

Compared to the static OLS approach, GMM models possess admirable tools to better manage the endogeneity problem. By using a GMM model one can use internally generated instruments to avoid the endogeneity problem (Greene, 2008).

One of the most important conditions in using the GMM approach is that all the explanatory variables (the right-hand-side variables of the equation) should be exogenous from the variable being explained (in our case current trade). The inclusion of lagged trade brings up the endogeneity problem. Hence, by using GMM this variable can be controlled by lagged internal instruments such as lagged levels and lagged differences (see Efendic et al, 2009). One might argue whether the GDP variable satisfies the exogenous condition? GDP as an explanatory variable can be correlated with the disturbance term. However, most authors in the literature ignore

the issue of autocorrelation between the disturbance term and GDP across country-pairs with the following argumentation: In bilateral trade flows, exports from country i to country j are part of country's i GDP and vice versa. However, exports to that country are only a small part of the GDP and the variable to be explained is bilateral trade not exports of a specific country. The GDP variable is thus considered exogenous and non-correlated with the disturbance term. Lagged GDP is also used as an internal instrument to avoid the endogeneity problem.

As mentioned earlier, the Balkan region has been characterized by the break-up of the Former Yugoslav Federation, new countries formation (Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro, Serbia and Slovenia) and armed conflicts. As a result, some bilateral trade data are missing. For instance, Bosnia and Herzegovina's exports data to the region exist only from 2002 on (whereas export data to Bosnia and Herzegovina from regional countries exist from year 2000). In addition, bilateral trade flows data between Bosnia & Herzegovina and Serbia & Montenegro are missing for years 2000 and 2001. Given the specific characteristics of the data being evaluated, the most appropriate approach would be to use the non-linear GMM estimation approach. The non-linear GMM does not rigorously require specification of proper instruments (Harris et al, 2008). The necessary condition that needs to be satisfied is that the number of moment conditions should be at least equal or greater than the number of the parameters that are being estimated. The condition would be that the variance of u_{ijt} is a constant (see the explanation in the previous paragraph) and that all stochastic elements of the equation are independent (Harris et al, 2008).

The literature on GMM estimation approach suggests that the model should use as many instrumental variables as possible. However, in the case of a finite sample this might bring up the problem of pitfalls (Harris, Matzas, and Sevestre, 2008). Since this paper uses a finite sample (11 years), its instrumental variables are set in a (-1 to -3) time lags dynamic. This is achieved through using the following instrumental variables: C(constant), LogTrade(-1 to -3); LogGDP(-1 to -3) LogGDPPC(-1 to -3) and Common

Language dummy variable. By using lagged trade and lagged GDP (-1 to -3 time lags) as instrumental variables, we avoid the endogeneity problem. Lagged GDPPC (-1 to -3) is also used as an instrumental variable to capture the effect of lagged income on trade. The equation also uses the language dummy variable as an instrumental variable. Literature on gravity models for trade considers the common language dummy variable as an important variable explaining bilateral trade (see Pllaha, A. 2010). However, the specific SEE-9 countries that speak a common language (Bosnia & Herzegovina, Croatia and Serbia & Montenegro) were involved in armed conflicts during the 90s. As a result, including this dummy variable to the equation produced a coefficient (for the common language variable) with the negative sign. Thus, in order to not ignore such an important variable we use it as an instrumental variable in the following GMM equation.

By using the GMM approach the problems of heteroskedasticity and autocorrelation are avoided. Taking into consideration the above given arguments, the dynamic developed model could be written as follows:

$$\log Trade_{ijt} = a_0 + a_1 \log Trade_{ij,t-1} + a_2 \log(GDP_{it} * GDP_{jt}) + a_3 \log(Distance_{ij}) + a_4(FTA_{ij}) + a_5(ColonLink_{ij}) + a_6(Contig_{ij}) + \upsilon_{ijt} \quad (3)$$

where: $\log Trade_{ij,t-1}$ is the lagged bilateral trade included in the equation as an explanatory variable. Note that GDPPC from equation (2) is removed in the final equation (3) in order to avoid the problem of equation misspecification.

The paper also diagnoses the empirical results in terms of robustness, checking for the sustainability of the data and the over-identifying restrictions. Such diagnostics, the data characteristics and the empirical results are treated in the next section.

4. EMPIRICAL RESULTS

4.1 DATA

The data used for the empirical application of the dynamic gravity model (developed from the base model of Frankel, Stein and Wei, 1997) is as follows:

- The dependent variable represents the current bilateral trade flows between country i and j at time t expressed in their natural logarithm form. Namely, $logTrade_{ijt}$. Source: *UNCOMTRADE database*.

- Explanatory variables:

- Real Gross Domestic Products of the exporter and importer in their natural logarithm form (GDP_{it} and GDP_{jt}, respectively); Source: World Bank World Tables (*World Development Indicators*).
- Distance in kilometers between the economic centers *i* and *j* expressed in natural logarithm terms. Namely, $log(Distance_{ij})$. Source: *Michelin distance database (www.viamichelin.com)*
- FTA_{ij} the Free Trade Agreement dummy variable, whether between the two countries exists an active free trade agreement. Source: *The European Commission http://ec.europa.eu and http://www.stabilitypact.org* (It should be noted that the dummy variables for bilateral free trade agreements that entered into force after the first six months of any specific year, are entered as =1 in the next coming year. It is believed that the effect of free trade agreements needs some time after the entry into force.)
- $ColonLink_{ij}$ the colonial link dummy variable, whether country *i* and *j* have been part of a common territory during the past 50 years. Source: *CEPPI database: http://www.cepii.fr*
- $Contig_{ij}$ the adjective dummy variable, whether country *i* and *j* share a common border among them. *Source: The European Commission and CEPPI database: http://www.cepii.fr*

4.2 RESULTS

As mentioned earlier, this discussion paper aims to evaluate the contribution of free trade agreements on trade flows in the region of South Eastern Europe (SEE-9). Previous authors using gravity models for trade have mostly used the static panel data estimations approach, namely, the OLS approach. As underlined earlier in the paper, there are several theoretical economic reasons to believe that current trade is affected by lagged trade flows and lagged GDP. To allow such dynamics, in estimating trade flows, a dynamic GMM model was developed in section 3 (model (3)). Several econometrical and theoretical argumentations (as underlined in the modeling section) suggest that the GMM approach is the appropriate one in allowing dynamics into the gravity model for trade. However, the validity of the obtained outcomes from the fully developed GMM non-linear model (3) will depend on the statistical tests and diagnostics.

As explained earlier, the fundamental condition for the GMM estimator to be correctly specified is that there should be at least as many instruments as there are parameters in the model (see Arellano and Bond, 1991; Harris et al. 2008). If the number of the instruments is greater than the number of the parameters, the value of the optimized objective function (J-statistics) will be greater than zero. The most important statistical diagnostics in GMM estimation is the so-called Sargan test of the over-identifying restrictions. This material uses Eviews 6 in evaluating the GMM estimation of this specific panel data. In Eviews 6, the J-statistic is simply the Sargan statistic. It is worth noting here that the J-statistic reported by a panel equation differs from that reported by an ordinary equation by a factor equal to the number of observations. The GMM model (3) clearly passes the Sargan test of the over-identifying restrictions using the following formula: "scalar pval = *@chisq*(J-statistics value, Instrument rank – the number of estimated coefficients)". The "scalar pval" for model (3) = 0.399039098951. This suggests that the model has valid instrumentation and thus is rightly specified.

The model also passes the Hausman (1978) test, which is an important assumption in random effects estimation, assuming that

the random effects are uncorrelated with the explanatory variables (see Appendix 1).

Now that the model has successfully passed the needed diagnostics of the GMM panel estimation approach, the paper can proceed with the discussion of the estimated outcomes.

The fully specified model (3) not only passes the statistical diagnostic test but it also reveals some interesting results. It should be noted that almost all the estimated variables are statistically important and their coefficients have the expected signs. In accordance with the gravity model literature, the GDP variable results statistically important (at 1% level of significance) and has a positive effect on bilateral trade flows with an intercept of 0.226.

The most interesting result of the gravity outcomes is that current trade is affected by lagged trade. The inclusion of the first lagged dependent variable (1 lagged trade) resulted with a large positive coefficient intercept (0.638) and highly significant (at 1% level of significance). It is thus suggested that trade volumes last year will have a positive significant impact on current trade. This proves the theoretical assumption that current trade is influenced by lagged trade due to the "habit formation" concept, assuming that consumers get accustomed to specific products they have been using over time (Bun and Klaassen, 2002; Harris et al 2008).

As expected, the distance variable has a negative effect on trade flows. The distance variable is statistically significant at a 1% level of significance and negatively related to trade flows (-0.180).

One of the main aims of this paper is to see whether FTAs among SEE-9 countries have had a positive effect on trade flows. The GMM estimation suggests that the Free Trade Agreement variable is statistically important (at a 1% significance level). The GMM estimation produces a positive coefficient of 0.365 for the FTAs variable. This suggests thus, that the removal of border taxes has positively contributed to the regional trade flows and regional trade integration.

The time invariant contiguity dummy variable is also statistically significant at a 1% significance level and has a positive effect on bilateral trade (with a 0.310 coefficient). As suggested in the literature, neighbouring countries trade more among each other due to historically created trading ties.

In accordance with the literature suggestions, the colonial link dummy variable has a positive effect on bilateral trade. This dummy variable is statistically important at a 1% level of significance, and has a significant impact on current trade (0.483). It thus suggests that common history and cultural similarities contribute to trading networks that still continue functioning after the countries (federations) break up.

4.3 ACTUAL TO POTENTIAL TRADE

By applying the coefficient results from the GMM estimation to the gravity model (3), one can get the values of potential bilateral trade between countries *i* and *j* at a specific year *t* (Baldwin, 1994; Bussiere et al, 2005). These ratios of potential trade flows can be then compared to actual trade flow ratios[6]. The gravity model results reveal some interesting outcomes. For instance, the results suggest that actual trade flows among almost all SEE-9 countries are below their potential levels. This section treats actual to potential trade assessments for two specific SEE-9 countries (Albania and Bulgaria). The ratios for potential trade suggest that trade flows between Albania and SEE-9 countries are far below their potentials (see Appendix 2 in section 7). For instance, bilateral trade flows between Albania and the rest of the SEE-9 countries in 2010 were only at around 10% compared to their potentials (around 8% with Bosnia & Herzegovina, 10% with Bulgaria, 12% with Croatia, 7% with Romania, 17% Serbia and Montenegro and 7% with Slovenia). Whereas, bilateral trade flows with Turkey, in 2010, were about 22% of the potentials. Similar to the majority of SEE-9 countries, Albania's trade flows with regional countries are below their potentials. The analyses suggest that SEE-9 trade below their

[6] The graphical representations are subject to a methodological shortcoming for the SEE-9 economies as illustrated in Appendix 2.

potentials, and that trade flows among SEE-9 could be intensified. These findings are in line with Kucharčuková, Babecký and Raiser (2010), who also find out that SEE countries trade below their potentials, not only among them but also with the rest of the world.

Similar to Albania, Bulgaria's actual trade flows with most SEE-9 countries in 2010 are far below their potentials (around 10% with Albania, 5% with Bosnia & Herzegovina, 12% with Croatia, 20% with Macedonia, 35% with Serbia & Montenegro and 13% with Slovenia). It is thus suggested the existence of trade potentials between Bulgaria and the above mentioned countries. The gravity model produces some interesting outcomes regarding the ratios of trade flows between Bulgaria and the rest of the SEE-9 countries. Therefore, the ratio of actual trade flows in 2010 between Bulgaria and Romania (around 90%), Bulgaria and Turkey (around 68%) was much close to its potential. It seems that Bulgaria and the two above mentioned countries have managed to deeply integrate and to realize trade flows almost at their potentials. These findings are also in line with the findings of Pllaha, A. (2010); Albania's trade integration with Italy and Greece was close to its potential, however, trade integration with regional countries was far from below its potential.

4.4 POLICY IMPLICATIONS

The aim of this paper was to contribute to both the literature on the importance of dynamics in gravity models for trade and to the policy implications for trade integration of SEE-9 countries. The importance of lagged trade in explaining actual trade flows was underlined in the previous section. Next are listed some possible policy implications and suggestions from the results of the gravity model implications.

The empirical finding that actual trade flows are affected by previous trade does not only contribute to the literature on the importance of dynamics in explaining trade flows. It is also an indicator that underlines the importance of trade relations among SEE-9 countries. Policy makers should support and stimulate these economic relations that contribute to trade intensification.

The paper also finds that Free Trade Agreements have had a positive effect on trade flows among SEE-9 countries. This finding suggests that synchronized policy adaptations in stimulating bilateral trade have positively contributed to trade flows among SEE-9 countries. The rapid trade intensification among SEE-9 countries after 2002 could be well attributed to the bilateral FTAs. In other words, bilateral trade agreements have contributed to creating a regional free trade area.

The distance variable (transportation costs) is found to negatively affect regional trade flows. However, shortening physical distances (building roads, highways, ports, railways etc.) is not the only way to reduce transportation costs (although this is very important). SEE-9 governments could also decrease transportation costs by deeper integrating, by creating similar documentation requirements, avoiding double/triple border checks, creating similar standard requirements for the regional market etc..

The model also suggests that colonial links have a strong impact on trade flows. Once again this underlines the importance of historical trading ties on actual trade. Cultural similarities and common history positively affect trade integration.

The paper also finds out that actual trade flows among SEE-9 countries are far below their potentials. The gravity model suggests that trade flows among SEE-9 countries could be further intensified. Even though FTAs have positively contributed to regional trade flows, the region still represents an opportunity for further trade integration.

5. CONCLUSIONS

In summary, the overall evidence supports the importance of including dynamics into gravity models for trade. The GMM approach seems to be the right econometrical model in allowing dynamics into the gravity models for trade. The model produced robust outcomes (in terms of statistical diagnostics) underlying that previous trade positively contributes to actual and future trade flows. In accordance with the literature on gravity models for trade, the paper suggests that trade is positively influenced by GDP, FTAs, Colonial links and Contiguity. Trade flows are found to be negatively affected by the physical transportation distance between countries. The findings suggest that FTAs have positively contributed to the regional trade integration. However, the paper also finds out that most SEE-9 countries trade below their potentials.

Future research on regional trade could contribute to the subject by further researching on other means in measuring transportation costs, rather than using distance in kilometers. Other explanatory variables could be entered into the gravity model (eg. bilateral exchange rates). Further research could also contribute to the subject by focusing more on trade sector characteristics.

REFERENCES

Aitken, N.D. (1973), The Effect of EEC and EFTA on European Trade: A Temporal Cross Section. Analysis, American Economic Review, 63.

Alessandri, P. (2000), European and Euro-Mediterranean Agreements: Some Simulation Analysis on the Effects of the EU Trade Policy, Centre for Research on Innovation and Internationalisation (CESPRI), Working Paper, No 110, Universita Bocconi, Milan, June.

Augier, P. and Gasiorek, M., (2001), The Welfare Implications of Trade Liberalization between the Southern Mediterranean and the EU, School of European Studies, University of Sussex, November.

Bayoumi, T. and Eichengreen, B. (1997), Is Regionalism Simply a Diversion? Evidence From the Evolution of the EC and EFTA, in Ito, T. and A. O. Krueger eds., Regionalism versus Multilateral Trade Arrangements, The University of Chicago Press, Chicago.

Bun and Klaassen (2002), The Importance of Dynamics on Panel Gravity Models of Trade.

Bussiere et al., (2005), Trade Integration of Central and Eastern European Countries: Lessons from a Gravity Model.

Bussolo, M., and Niimi, Y. (2005), Do the Poor benefit from Regional Trade Pacts? An Illustration from the Central America Free Trade Agreement in Nicaragua, Paper prepared for the 8th Annual Conference on Global Economic Analysis, June 9 - 11, Lübeck.

Cheng, I-H. and H. J. Wall (2005), Controlling for Heterogeneity in Gravity Models of Trade and Integration, Federal Reserve Bank of St. Louis Review, 87, 1, 49-63.

Council of The European Union (2006), Stabilization and Association Agreement between the European Communities and their Member States, of the one part, and the Republic of Albania, of the other part, Brussels.

Efendic et al. (2009), Institutions and Economic Performance: System GMM Modelling of Institutional Effects in transition, Staffordshire University Business School, Leek Road, Stoke-on-Trent, College Road, ST4 2DF, UK.

Frankel, J., Stein E. and Wei S., (1997), Regional Trading Blocs in the World Economy, Institute of International Economics, Washington D.C., October.

Harris et al (2008), Production Profile Compatibility in a Dynamic Gravity Model of Trade, March.

Hoekman, B. and Konan, E. (1998), Deep Integration, Non-discrimination and European Free Trade, Paper presented at Conference Regionalism in Europe: Geometries and Strategies after 2000, Bonn, November 6-8.

Jarvis, Ch. (2000), The Rise and Fall of Albania's Pyramid Schemes, (IMF, 2000).

Kaminski, B. and de la Rocha, M. (2003), Stabilization and Association Process in the Balkans: Integration Options and their Assessment, Washington.

Kucharčuková, O. Babecký, J. and Raiser, M. (2010), A Gravity Approach to Modelling International Trade in South-Eastern Europe and the Commonwealth of Independent States: The Role of Geography, Policy and Institutions.

Krugman, P. (1979), Increasing Returns, Monopolistic Competition and International Trade, Journal of International Economics.

Kovac, Oskar (1998), Trade Flows among Balkan Countries and Opportunities with SECI", paper prepared for the American Association for the Advancement of Slavic Studies (AAASS) Conference in Boca Raton, Florida.

Lawrence, R., (1997a), Preferential Trade Agreements: the Traditional and the Old, in A. Galal and B. Hoekman eds., Regional Partners in Global Markets: Limits and Possibilities of the Euro-Med Agreements, Center for Economic Policy Research: London.

Linder, S. (1961), An Essay on Trade and Transformation, Uppsala: Almqvist and Wiksells.

Linnemann, H. (1966), An Econometric Study of International Trade Flows, Amsterdam: North Holland.
Lipsey, R.G. (1957), The Theory of Customs Unions: Trade Diversion and Welfare, Economica, 24, pp. 40-46.

Maskus, K., and Eby Konnan, D. (1997), Trade Liberalization in Egypt, Review of Development Economics, 1(3).

Meade, D. (1955), The Theory of Customs Unions, North-Holland: Amsterdam.

NEXUS (2009), DEVINPRO Fact Sheet Albania, Tirana 2009.

Pllaha. A. (2010), EU – Albania Stabilization and Association Agreement. Gravity model for trade: The Albanian Case", Bank of Albania, Tirana 18 – 19 November 2010.

Smith, A., and Venables, A. (1988), Completing the Internal Market in the European Community: Some Industry Simulations, European Economic Review, 32 (7).

Soloaga, I. and Winters, L.A. (2001), Regionalism in the Nineties: What Effect on Trade?, North American Journal of Economics and Finance, Vol. 121.

Stability Pact for South Eastern Europe (2006), Free Trade Agreements in SEE, Sarajevo.

Velde, D.W. te, Page, S. and Morrissey, O. (2004), Regional Integration and Poverty: Mapping the Linkages, Report for an EC-PREP Project on Regional Integration and Poverty, Overseas Development Institute, London.

Vika, (2006), Measuring Import and Export Functions in Albania, Bank of Albania, December.

Viner, J. (1950), The Customs Union Issue, Carnegie Endowment for International Peace, New York.

World Bank (2000), The Road to Stability and Prosperity in South Eastern Europe: A Regional Strategy Paper, Washington, March.

Zahariadis, Y. (2007), The Effects of the Albania-EU Stabilization and Association.

Viner, J. (1950) The Customs Union Issue, Carnegie Endowment for International Peace, New York.

World Bank (2000) The Road to Stability and Prosperity in South Eastern Europe: A Regional Strategy Paper, Washington, March

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APPENDICES

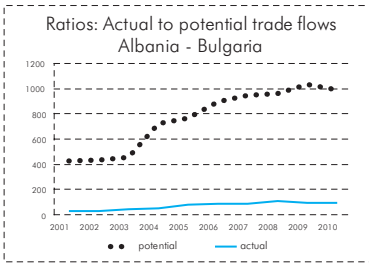
1. GMM RESULTS OF THE DYNAMIC GRAVITY MODEL 3

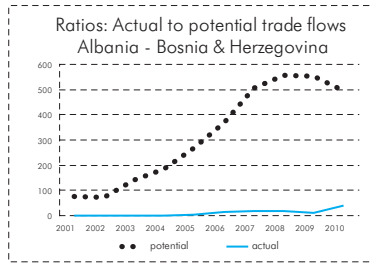
	Base model(1)	Model(1) + Dummies	Dyn_GMM model(3)
$Trade_{ij, t-1}$	–	–	0.638***
GDP_{ij}	0.540***	0.677***	0.226***
$GDPPC_{ij}$	0.519***	0.059	–
$Distance_{ij}$	-1.707***	-0.277***	-0.180***
Dummy_FTA	–	0.770***	
0.365***			
Dummy_Contiguity	–	1.322***	0.310***
Dummy_Colonial Link	–	1.698***	0.483***
R^2	0.62	0.78	Unknown to GMM
Sargan Test (scalar pvalue)			Yes (0.399)
Hausman test			Yes (0.237)

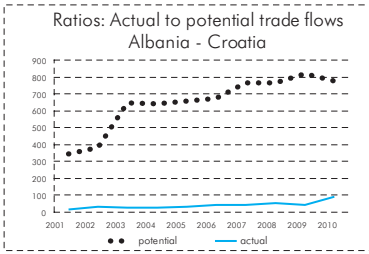
*** Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

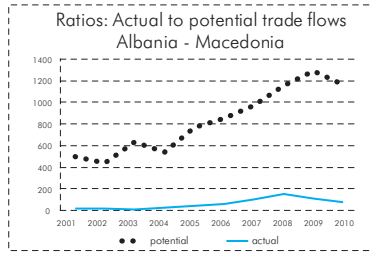
2. RATIOS: ACTUAL TO POTENTIAL TRADE FLOWS BETWEEN SEE-9 COUNTRIES:

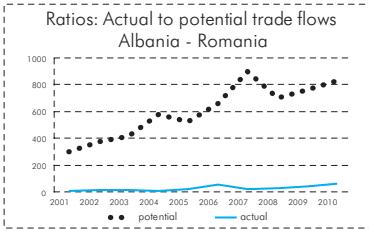
Appendix 2a) Ratios: Actual to Potential Trade Flows between Albania and SEE-9 countries:

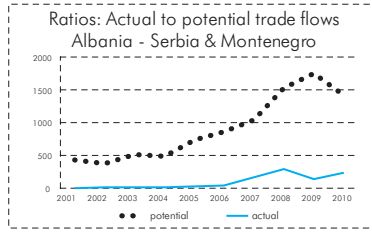


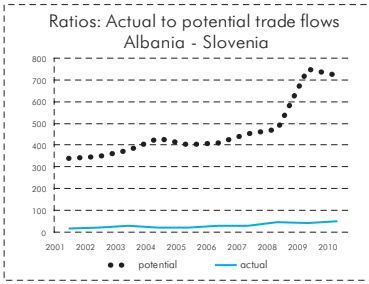


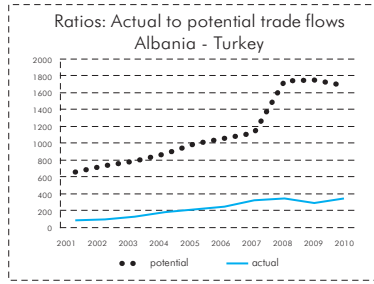










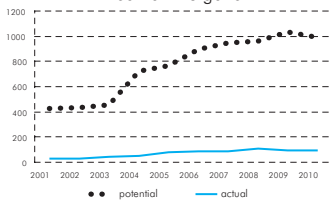


Source: Authors own calculations, using gravity model estimations.

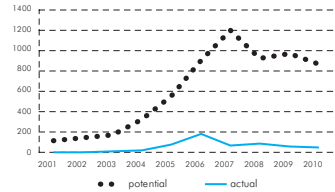
Note: scale may differ across charts to enhance readability in accordance to trade flow differences among countries

Appendix 2 b) Ratios: Actual to Potential Trade Flows between Bulgaria and SEE-9 countries:

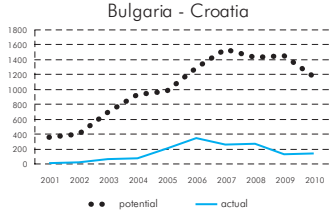
Ratios: Actual to potential trade flows
Albania - Bulgaria



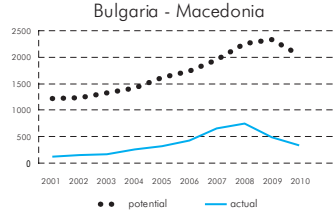
Ratios: Actual to potential trade flows
Bulgaria - Bosnia & Herzegovina



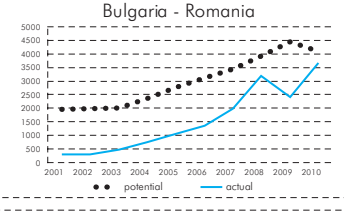
Ratios: Actual to potential trade flows
Bulgaria - Croatia



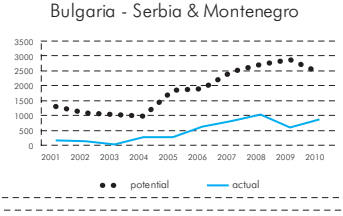
Ratios: Actual to potential trade flows
Bulgaria - Macedonia



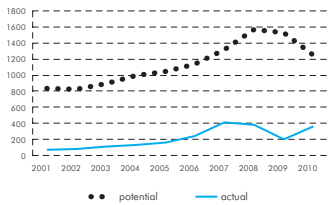
Ratios: Actual to potential trade flows
Bulgaria - Romania



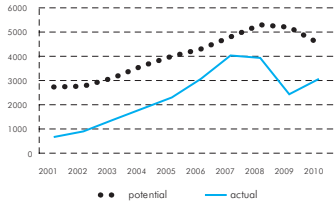
Ratios: Actual to potential trade flows
Bulgaria - Serbia & Montenegro



Ratios: Actual to potential trade flows
Bulgaria - Slovenia



Ratios: Actual to potential trade flows
Bulgaria - Turkey



Source: Authors own calculations, using gravity model estimations.
Note: scale may differ across charts to enhance readability in accordance to trade flow differences among countries

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