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TRADE RELATIONS BETWEEN LATIN AMERICA AND THE EUROPEAN UNION: THE ROLE OF INSTITUTIONAL FACTORS

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Abstract

The trade theory seeks to identify the variables determining international exchange between countries. In recent years, variables not traditionally considered in traditional models, such as

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geographic location, the cost of transport, and cultural and institutional factors have emerged as important explanatory variables, and therefore need to be incorporated in the analysis.

In order to make new contributions, this paper contains an extended business gravity model with panel data and random effects that combine institutional, economic and cultural changes as one of the determinants of bilateral flows between the country of origin and the rest of the world during the period 1995-2011, through the use of different aggregate indicators, incorporated as explanatory variables in different design specifications.

The objective of this research is to design an extended/modified model of trade where the economic characteristics of countries are combined with the institutional and policy factors of trade, such as EU alignment, EU common policies, the impacts of the Euro, trade agreements, and the application of this model on the analysis of International Trade between Latin American countries, Germany and the Czech Republic. We would also like to explain the gaps between the real and theoretical trade by means of robust estimation techniques, thus enabling us to quantitatively assess the role of institutional factors, Free Trade Agreements, and other factors on trade.

Key words: International Trade, Institutions, Gravity model, Germany, Czech Republic, Latin America

Introduction

We will study how economic and institutional factors influenced Latin American trade with two dynamically evolving EU countries- the Czech Republic and Germany. We will compare the results of adjusted gravity models of the Czech Republic with the results for Germany, selected for its large size as a benchmark. The estimated behavioral parameters and break-even points of robustness will be used for the analysis of policies and institutional factors of trade. We have selected 17 Latin American countries³ as a sample for a more detailed analysis of trade flows between this region, the Czech Republic and Germany. We will study how the original "remoteness" of Latin American countries before 1995 gradually narrowed due to their closer institutional alignment with Europe and why, notwithstanding such a convergence, the trade gap between Latin America and Central Europe is still very low.

The World Bank report of 2004 acknowledged that the quality of institutions is an important element in the smooth functioning of a market. On this basis, we can assume that the institutions are more developed, transaction costs lower, and thus, the efficiency of markets and the economic system as a whole are greater.

De Groot (2003) also highlights the positive correlation between trade and institutional quality, and with the help of a gravity model, the author shows how the similarities between countries, from the point of view of institutional quality, tend to increase bilateral trade between them.

The recent world financial crisis brought an unexpected break to previous economic growth (1992-2007), which commenced with a wave of globalization after the demise of

³ Argentina, Bolivia, Chile, Costa Rica, Brazil, Colombia, Guatemala, Honduras, Ecuador, México, Nicaragua, Panama, Paraguay, Peru, Salvador, Uruguay, Venezuela.

communism. Both the inception and the fall of prosperity had a common feature: the spillovers of the world-wide trade into national economies – first positive and then negative. This paper will analyze the development of trade during the period 1995-2011 in one small economy, the Czech Republic, and one of the biggest economies in Europe, Germany. It designs a gravity model, where extended business combines economics with institutional quality, on the one hand, and infrastructural factors, Free Trade Agreements, political factors and the other variables that are statistically significant and relevant to explain the bilateral trade within a wide sample of countries, on the other.

The main objective of this research will be the contribution of new insights into the trade flow mechanisms of these countries based on an econometric model.

The first section of this work reviews the literature which illustrates the links between institutional factors and trade concerns. The second section describes the characteristics of the gravity model, the methodology and data sources used. The third section summarizes the methodological specifications of the research, and the last section contains the results of this research.

Theory Background

Jan Tinbergen, the first Nobel laureate in economics, was one of the pioneers in the application of mathematical tools in economics. He was the first economist to use the concepts based on the law of universal gravitation, developed by Newton in the field of physics. He applies it to economy, specifically for the determinants of trade flows between the countries, in his 1962 work Shaping the World Economy. In this work (1962), he states that the trade volume increases between two countries (or regions) with the size of their economies and decreases with the distance that separates them. The gravity model is used to estimate the structure of international trade. The basic model consists of factors related to geography and spatiality. It was subsequently expanded and used to test hypotheses about economic theories of international trade.

The academic popularity of the gravitational equation only goes back to the 1970s and 1980s. In the past 20 years, the model has again become fascinating because of the contributions of Anderson and Bergstrand (1979), who give sustenance to theoretical, econometric models developed based on the theories of differentiated goods, which measure the benefits of trade liberalization and border trade barriers. The empirical strength of this model is well known for its ability to identify extreme cases of artificial trade barriers, as well as the role of distance and the effects of the customs unions and commercial agreement between different geographical regions.

One of the first authors to apply the gravity model was Norman Aitken (1973). He used the gravity model as an empirical way to analyze the impact of different trade policies or simply to analyze the determinants of trade flows between different geographical entities. This econometric model has been applied to different areas such as the analysis of foreign direct investment, tourism and migration, among others.

Aitken (1973), along with several others; Bergstrand (1985) and Thursby & Thursby (1987), was part of a series of economists who were all commissioned to show that European trade blocs had increased their trade during the 1960s and 70s.

Paul Krugman and Elhanan Helpman (1985) also completed the gravity model using explanations based on the Heckscher - Ohlin Model and their new international trade theory. With the theory of Geography and International Trade, Paul Krugman (1991) affirmed that the dominant factor used to explain a concentration of trade is geographic proximity between trading partners. The distance can represent the geographic proximity when inserted as a significant parameter in the gravity equation.

Subsequent work by Frankl & Weiss (1993), Frankel et al. (1995) and Frankel (1997) found evidence of trade creation between trading blocs in Asia and North America from 1970-1992, while the Soloaga & Winters study (2001) found significant evidence of trade creation in Latin America during the nineties. The work of Rose (2000), Feenstra et al. (2001), and Frankel & Rose (2002) found, too, that the agreements are, in general, trade makers. Rose explains the effects of multilateral trade agreements, added variables such as culture, common language, geography and history; in conclusion, it is possible to say that the World Trade Organization (WTO) and the Agreement General Agreement on Tariffs and Trade (GATT) had a significant effect on the role of trade creators (Andrew Rose, 2002).

Gravity Models and the Factors of Trade Flows

The current and potential trade of individual countries, related to the gravities of home and partner's GDPs, can vary subject to different structural and institutional footings in their economies. This causes trade diversion and structural trade gaps that imply the suboptimal use of domestic resources, bringing us to the question, 'Which endogenous factors should we consider in our analysis?' The first mechanism to be considered a significant obstacle to trade is related to the transaction costs of infrastructure. Traditional gravity models treat this rigidly by incorporating the distance among the three core variables. Clearly transport costs are related to distance, but this dependence cannot be linear. Therefore, we should modify this variable. Babeckii, Kukhartchuk and Raiser, 2003, added the factor of being land-locked.

The second group of factors include integration blocks and regional groupings with common treatment of the system of tariff/non-tariff preferences. Their importance can be estimated by adding integration/regional dummies for capturing fixed effects in the gravity model, as proposed by Anderson and Wincoop (2003). We could distinguish between the EU membership (even adjust for duration), EU association, GSP alignment and similar arrangements in the partner countries.

The third group represents the specific indicators of institution quality (WTO 2004): government effectiveness (GE), the rule of law (RL) and corruption control (CC). Indicators were taken from the database created by Daniel Kaufmann (2006).

Government Effectiveness (GE), refers primarily to the quality of bureaucracy, professionalism of staff and the credibility of the commitment to policies, including trade. It is; therefore, a measure of the quality of government functions. The rule of law (RL) indicator approximates the level of public confidence in the law. It reflects the quality of the legal system and the enforcement of contracts. It encompasses indicators of the incidence of crime, the effectiveness of the judiciary and the ability to enforce contracts. The Corruption Control (CC) indicator reflects the level at which public authorities are used for private gain.

The fourth crucial policy instrument is the usage of a common currency – in this case primarily the euro. Here our approach will become a follow-up of the studies initiated by Rose (2000), with new findings added by Baldwin (2006). By pointing to significant positive impacts of the Euro on trade flows, these papers evoked a plethora of followers (see e.g. Thom and Walsh, 2002, in the Irish case). Unfortunately, more recent studies have shown that the Euro has widely diversified effects on trade, where differences among countries can be substantial (see Havranek, 2009 or Frenkel, 2008).

The next step draws from our own recent experience in modeling the attraction of FDI flows by 32 European countries (Lenihan, Andreosso-O'Callaghan, Kan, Michalikova and Benacek, 2009) where we found that, except for fundamental economics and macroeconomic policy variables, there are also important political risks that influence the capacity to invest and trade. Therefore, in our models, we will test the importance of variables defined as impediments to various freedoms such as: freedom from corruption, government fiscal inefficiencies, monetary and price instability, trade impediments and property rights capture. The Heritage Foundation is the main provider of such data (Kaufman, 2006).

The Gravity model and Latin America

Among the analysis applied to the region of Latin America, we can mention the work of Lewer and Saenz (2004) who analyze the equity release EFET on trade flow through a gravity model extended to 20 countries in Latin America. Rojas, Calfat and Flores (2006) show the relevance of the preferential trade agreement in the Andean Community of Nations, as well as the importance of geography and infrastructure as key elements in the development of trade between these countries.

Nowak-Lehman and Martínez-Zaroso (2003) analyzed MERCOSUR sectoral exports to the EU: the role of economic and geographical distance by gravity model, while Martínez-Zarzoso (2003) applied the gravity trade model to assess Mercosur - European Union trade and the trade potential following agreements recently reached between the trade blocks. The model tested a sample of 19 countries. Carrillo and Li (2002) discussed the importance of preferential trade agreements in Latin American trade, referencing the Andean Community and the Southern Common Market (Mercosur). The study of international trade in Latin America through the use of the gravity model has proven to be an efficient tool for analyzing regional trade. However, a lack of continuity can be observed. Trade relations between Latin America and the European Union have not been analyzed through a gravity model to identify the determinants of international trade between the two regions today, which is what this paper will strive to do, through two case studies.

Characteristics of the Gravity Model: Methodology and Data

According to the standard gravity model of trade, exports Xi j t from country i to county j in year t are a function of domestic GDP Yit, partner's GDP Yjt and the impediments to trade represented by distance between countries Dijt:

$$\mathbf{X}_{ijt} = \mathbf{a} * \mathbf{Y}_{it} * \mathbf{Y}_{jt} * \mathbf{D}_{ijt} * \mathbf{D}_{ijt} * \mathbf{\epsilon}_{ijt}$$

where exponents of these variables are the behavioral parameters to be estimated, ε is the error term and i, j = {1, 2, 3, ..., m} are countries and t = {1995, 1996, ..., 2008} is the years.

Our modification/extensions of this model will include the concentration on a particular "home country" $i = \{$ the Czech Republic, Germany $\}$, the introduction of common currency variable E (particularly the Euro) and the usage of two vectors with institutional variables N and R. The former represents various dummies with integration/treaty arrangements and the latter dummies for variables of risk, cultural or psychic factors of trade:

$$X_{i,jt} = a * Y_{it}^{b} * Y_{jt}^{c} * D_{ijt}^{d} * E_{ijt}^{e} * N_{ijt}^{n} * R_{ijt}^{r} * \varepsilon_{ijt}$$

Our analysis will be derived from the econometric estimation of trade flows (e.g. exports) between countries i and j ($i\neq j$). The estimation procedures will draw from our past experiences with this kind of modeling by means of panel data (see Benacek et al. (2005 and 2006)). The usage of estimation techniques depends on the characteristics of data. We will utilize the one-way panel estimation. The default method will be Ordinary Least Square (OLS) and Poisson estimation (PO). The other methods we will use are derived from them: Poisson Pseudo-Maximum Likelihood, LSDV – Least Square Dummy Variable and panel estimation method "Mundlak" (Mundlak, 1978). We will control for time characteristics by time dummies or by the inclusion of linear trend. The individual fixed effects will not be controlled for, at least not directly. This is because of the nature of the gravity model and its exact sciences heritage. We are aware of the drawbacks and insufficiency of the model and its cross-sectional setting (see Milner and Greenaway, 2002).

The LSDV framework along with Poisson estimation (PO) is commonly used in standard gravity models of trade. Panel estimation is possible and we are utilizing only the "Mundlak" estimation which allows relaxing the assumption in the random-effects estimator that the observed variables are uncorrelated with the unobserved variables. Standard fixed effects estimation (not reported) removed a lot of variation and it changed the nature of analysis to within estimation without the distance variable. Standard random effects model (not reported) failed to provide consistent estimation and didn't pass the Hausman test. The linear dynamic panel-data method, the generalized method of moments (GMM) estimation is another way to get the results for our gravity model; however, this estimation requires well selected instrumental variables, which might be problematic to vindicate, with the risk of underestimating of standard errors. Our (not reported) consistent estimates only suggested significance of lagged variables (dependent and GDP) in the robust two way estimation.

These findings have brought us back to the selected methods (LSDV, PO, Mundlak) which describe rather a general tendency in trade relations. We are aware that for one region or a country the time series analysis (for example: vector error correction model, vector autoregressive model) will be the proper estimation technique to obtain clear-cut results. The standard errors will be reported as a cluster robust, i.e. adjusted according to the group variable which is the country identifier. The policy analysis will rely on the estimation of exports to various territories using the parameters describing behavioral characteristics of real



trade, meanwhile the policy/institutional variables will simulate their presence or absence of given instruments. The data will be collected from Eurostat, European Commission, the World Bank, IMF, CEPII, Geobytes, Heritage Foundation, WTO, UNCTAD & our own estimation.

Methodological Specificities of the Research

Another innovative approach to methodology concerns the methods of estimation. Instead of basing the gravity model econometrics on data for a single year of observation, we will concentrate on the panel data of bilateral trade by countries for 16 years, from 1995-2011, with more than 20 explanatory variables, which will require processing thousands observations for each country. We are using five models which we selected after sensitivity analysis. For every regional analysis (Germany and World + Latin America, Czech Rep. and World + Latin america) of trade (export and import separately) five models are estimated:

M (1): Basic regressions (OLS) with "cluster robust" standard errors, i.e. we have controlled for the time trend and adjusted our measurement error according to country specifics.

M (2): Time specific dummy regression (LSDV) with "cluster robust" standard errors, i.e. we have controlled for time effects (one way panel) and we have adjusted our measurement error according to country specifics.

M (3): Poisson (PO) time specific regression with "cluster robust" standard errors, i.e. we have controlled for time fixed effects (one-way panel, GDP Germany dropped out) and we have adjusted our measurement error according to country specifics.

M (4): Poisson Pseudo-Maximum Likelihood (PPML) time specific regression with "semi robust" standard errors (Santos Silva and Tenreyro, 2010).

M (5): "Mundlak" random effects (MRE) estimation with group-means of independent variables added to the model (group variables are not reported).

Results

According to the results, German exports to the world are influenced by the distance, real GDP of trading partner, three World Bank institutional factors: Government Effectiveness, Rule of Law, Voice and Accountability, three Heritage Foundation institutional factors: Business Freedom, Trade Freedom, Monetary Freedom, education and Euro. We observed that the distance has negative effects from -0.70 % to 0.82 % in German exports to the world (sample of 177 countries). On average if a country/trading partner would increase their real GDP by 1 %, German exports would grow between 0.85 % and 1.034 %, if the economic conditions do not change. If the Government effectiveness would increase in 10 %, this could increase German exports up to 8.51 %, in the case of Rule of Law it would be 1.08 % to 1.1 %. Other significant variables are also Business Freedom, Trade Freedom and Monetary Freedom.

German imports from the rest of the world, according to the calculations made, are primarily negatively affected by the distance between -0.67 % to -0.814 %. A 1% increase in the partner's GDP would increase the German imports from 0.88 % to 1.1 %. Trade agreements are clearly statistically important in the PPML model. The custom union apparently could have a negative effect on German imports. The significant institutional factors are Government Spending and Financial Freedom. An improvement of 10% in Corruption Control and Government effectiveness could mean a growth up to 1 % in imports.

In the second part of the analysis, we focus on German exports to Latin American countries. We can observe that German exports to Latin America and Caribbean (sample of 29 countries) depends on the distance, the size of the economy (GDP) of the trading partner, some institutional factors, like Government Spending, Financial Freedom (from the Heritage Foundation) and three indicators from the World Bank: Control of Corruption, Political Stability, and Voice and Accountability, which we can observe in the results shown in Table 3. The distance in the exports to Latin America and the Caribbean has a negative effect which ranges from -1.19 % to -1.34 %. On average, if a Latin American country has 1 % higher real GDP then the German exports to this region will be from 0.98 % to 1.099 % higher (ceteris paribus). Exports could be higher between 17.8 % and 42.4 % in the countries where an FTA exists, which is the case of Mexico, Chile and Caribbean countries. Between institutional factors, it seems that with an increase of 10 % in the Political Stability, exports could increase up to 3.18 % while the same increase in Government Effectiveness could increase German exports to Latin America between 1.2 to 2.75 %.

The other analyzed variables were not statistically significant. In the PPML model where no country specifics are controlled for, a 10 % lower Fiscal and Monetary Freedom can lead to 5.55 % and 6.1 % higher exports, respectively. It seems that more goods will flow into countries with bad fiscal policies (wasteful public spending) and bad monetary setting (currency depreciation and inflation).

In the case of German imports from Latin American countries, we can observe a dependence on Germany's Real GDP, the Real GDP of the trading partner, Property Rights, Government Effectiveness, Political Stability and Rule of Law variables. The results can be observed in Table 4 in the annex. On average, the trade agreements are not significant in comparison to the case the exports. Even in the PPML model, the FTA variable is only significant with a 10 % alpha and suggests a 0.28 % increase in imports. We note that the distance is not significant to the imports from Latin America to Germany as it was in the case of exports. On average we observe that if a Latin America country increases its GDP in 1 %, the imports from Latin America will increase from 0.83 % to 0.91 % if the economic conditions do not change. If we look at institutional factors we can see an import increase from 1.1 % to 2 % if the Property Right variable increases in 10 %. Another significant variable is the Rule of Law, in which a 10 % increase could lead to 2.4 % to 4.32 %.increase in imports. The institutional indicators of Stability Policy and Regulatory Quality could have a positive effect increase of 0.3 % -0.5 % and 0.24-0.43 % respectively.

According to the results of Czech exports to the world (sample of 177 countries), we can observe that Czech exports are influenced by the distance, Real GDP of trading partner, four institutional factors of Heritage Foundation, which differ from those which affect

Germany, apart from Monetary Freedom, are Fiscal Freedom, Investment Freedom, and Property Rights. Out of the World Bank institutional factors, the most significant are Voice and Accountability, with Political Stability and Government Effectiveness maintaining a less significant role. The only factor that differs to Germany is Policy Stability, which could influence in Czech exports while statistically German exports are affected by the Rule of Law. To highlight the most important factor, we observe that the distance negatively affects Czech exports to the rest of the world from 1.1% to 1.4%. On average, if a country/trading partner will increase their Real GDP by 1%, Czech exports will grow up to 8.1%; an increase of 10% in Stability Policy could result in an increase up to 1.82%; while in the case of Voice and Accountability an increase from 1.12% to 1.29% could be expected. The other variables which are also significant are Business Freedom, Fiscal Freedom, Monetary Freedom and Investments Freedom.

Czech imports from the rest of the world according to with our calculations are affected overall by the distance with a negative effect between -0.74 % to -1.1 %. The GDP of trading partner, if increased by 1 %, would increase Czech imports from 0. 59% to 1.04%. Accordingly, trading agreements are statistically significant in all the models applied and could increase Czech imports from 0.69 % to 1.86 %. Also, the summit union could have a negative effect in Czech imports to the entire world. The most significant institutional factors are Investment Freedom and Financial Freedom (data comes from the Heritage Foundation), which, with an increase of 10%, could have a positive effect of up to 5.1 % and 5.08 % respectively. An increase of 10% in Corruption Control would have a reaction opposite to that of Germany's, reducing Czech imports by about 1.1%. An improvement of 10% in Government Effectiveness could mean an increase from 2 % to 19 %; while a similar increase in Political Stability could result in an increase from 0.8 % to 4.82 % in Czech imports.

In the second part of the analysis, we focus on Czech exports to Latin American countries. We can observe that Czech exports to Latin America and the Caribbean (Sample of 29 countries) are quite dependent on the distance, as is also observed in the larger German economy. Among the other variables which affect Czech exports are GDP of Latin American social partner economy, five Heritage Foundation institutional factors- Business Freedom, Government Spending, Investment Freedom and Financial Freedom, and three indicators from the World Bank- Government Effectiveness, Political Stability and Quality Regulation, not unlike those affecting Czech exports to Latin America. The results can be observed in Table 7. We observe that distance negatively affects Czech exports to Latin America and the Caribbean with a negative effect from -0.5 % to -1.038 % according to the results of the different methods that we used it. On average, if a Latin American country has a 1 % increase in Real GDP, the Czech Republic exports to this region will increase from 0.862 % to 0.937 % and more, if the economic conditions do not change (ceteris paribus). Unlike Germany, trade agreements are not statistically significant to Czech exports.

Between institutional factors, it seems that an increase of 10% in Policy Stability could increase exports up to 5.81% as well as the Government Effectiveness, which could increase Czech exports to Latin America up to 2.9%, while a reduction of 10% in Quality Regulation could increase Czech exports to Latin America from 3.4% to 6.3%.

Some factors were weakly significant; for example, Investment Freedom, which an increase of 10% could increase exports up to 1.001%, while the same increase in Business Freedom and Financial Freedom could improve Czech exports to Latin America from 3.4 % to 9.68 % and from 1.3% to 5.93% respectively. The other analysed variables were not statistically significant in Czech exports to Latin American region.

Czech imports from Latin American countries depend on the Real GDP of the Latin-American social partner, and unlike German imports which are not affected by distance, the small Czech economy is affected from -0.985% to -3.157%. Other variables related to our results which are significant to Czech imports of Latin American goods are Business Freedom, Investment Freedom, Corruption Control and Political Stability. The results can be observed in Table 8. From these results it can be observed that the trading agreements do not register statistical significance in Czech exports to Latin America either. On average, we note that if a Latin American country increased its GDP by 1%, Latin American imports would increase from 0.86 % to 1.04 % if the economic conditions do not change. For the institutional factors we observe a change from 2.5 % to 3.18 % if Investment Freedom variable increases by 10 %, while if Rule of Law is reduced by 10%, imports could increase between 2 % and 6.22 %. Ostensibly, the institutional indicators of Political Stability and Corruption Control could have a positive effect with an increment from 4.2 % to 4.5 % and 3.5 % to 15.62 % respectively.

Conclusions

This paper applied a gravity model to analyze bilateral exports and imports between two European economies, Germany and the Czech Republic, and the countries of Latin America. Due to the characteristics of the model, we had to do a complete analysis of all countries and then repeat it using only Latin America. The total sample was 177 countries and contained more than 80,000 pieces of data (German data sample contains 177 countries, 17 years and about 30 variables). The main objective of this research was to analyze the determinants of trade between Germany and Latin America, and the Czech Republic and Latin America as two analytical case studies.

We looked at the behavior and determinants of trade in these two European countries with the rest of the world in order to compare it with that of Latin America (29 countries including the Caribbean countries)

We observed that for a bigger economy such as Germany, the distance does not affect imports from Latin America, while for a small economy, such as the Czech Republic, the distance can negatively affect these imports. However, for the European countries in our analysis, the distance negatively affects exports to Latin American countries.

We investigated the role of free trade agreements, which have a relatively important role in Germany but in the Czech Republic's smaller economy, they were not as significant as expected. However, the role that institutions play was much bigger than expected. In both the small and large economy, the relation of institutions and trade is very important, with some of the stronger determinants being Political Stability, Government Effectiveness, and Rule of Law. Our results support the hypothesis of the importance of these variables, as most of them are statistically significant and presented as expected.

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Annex

Tab. 1: Germany Gravity Model-exports-world	Tab. 1:	Germany	Gravity	Model-exports-world
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1a0. 1.	Germany		ci-capoi to-	, or lu	(-)
Exports	(1)	(2)	(3) PO	(4) PPML ⁱ⁾	(5) MRE (I N)
Distance (IN)	0.828***	0.826***	0.712***	0.702***	0.822***
Distance (LIN)	-0.828	-0.820	-0.712	(0.02)	-0.822
Real GDP (IN)	1 278***	(0.07)	(0.00)	1 338***	0.008***
Germany	(0.36)	(0,00)		(0.35)	(0.29)
Control CDP (LN)	0.077***	0.077***	0 870***	0.853***	1 03/***
Dortnor	(0.04)	(0.04)	(0.070)	(0.01)	(0.08)
Free trade agreement (FTA)	(0.04)	(0.04)	0.02)	0.165***	0.021
The trade agreement (FTA)	(0.16)	(0.16)	(0.13)	(0.05)	(0.07)
Customs union	(0.10)	(0.10)	0.119	0.108**	(0.07)
Customs union	0.097	0.101	0.110	0.108	0.104
	(0.16)	(0.17)	(0.14)	(0.04)	(0.11)
Economic Integration	-0.176	-0.172	-0.186*	0.171***	-0.128
	(0.19)	(0.19)	(0.11)	(0.04)	(0.09)
Border	0.107	0.107	0.111	0.155***	0.088
	(0.15)	(0.15)	(0.09)	(0.03)	(0.32)
Control of Corruption	0.002	0.002	-0.001	-0.131*	0.001
	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)
Government Effectiveness	-0.004	-0.004	0.020***	0.851***	-0.003
	(0.01)	(0.01)	(0.00)	(0.09)	(0.00)
Political Stability	0.002	0.003	0.003	0.158***	0.004***
	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)
Regulatory Quantity	0.010*	0.010	-0.007	-0.270***	0.002
	(0.01)	(0.01)	(0.00)	(0.07)	(0.00)
Rule of Law	-0.002	-0.002	0.011**	0.108**	0.001
	(0.01)	(0.01)	(0.00)	(0.05)	(0.00)
Voice and Accountability	-0.002	-0.002	-0.009***	-0.204***	-0.003*
	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)
Euro=1 (No Euro)	-0.258	-0.261	-0.501***	-0.408***	0.052
	(0.19)	(0.19)	(0.11)	(0.04)	(0.13)
Euro=2 (Euro Treaty)	0.166	0.171	-0.140	-0.093**	0.176
	(0.16)	(0.16)	(0.12)	(0.04)	(0.11)
Euro=3 (Access phase)	0.029	0.033	-0.203**	-0.142***	0.062
	(0.12)	(0.12)	(0.08)	(0.04)	(0.07)
Business Freedom	0.000	0.000	-0.007*	-0.367***	0.002
	(0.00)	(0.00)	(0.00)	(0.10)	(0.00)
Trade Freedom	0.002	0.002	0.007**	0.444***	0.002
	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)
Fiscal Freedom	0.003	0.004	0.002	0.137*	0.000
	(0.00)	(0.00)	(0.00)	(0.07)	(0.00)
Government Spending	0.003	0.004	0.000	0.001	0.002**
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
Monetary Freedom	-0.004*	-0.004	-0.005**	-0.056***	-0.000
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
Investment Freedom	-0.002	-0.003	-0.001	0.019	0.001
	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)
Financial Freedom	0.000	0.000	0.002	0.161***	0.002*
	(0.00)	(0.00)	(0.00)	(0.06)	(0.00)
Property Rights	0.001	0.001	0.003	0.155**	0.001
	(0.00)	(0.00)	(0.00)	(0.06)	(0.00)
Freedom Corruption	0.007	0.007	-0.001	0.110**	0.001
•	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)
Education	0.011***	0.011***	0.003	0.234***	0.011**
	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)
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Year	-0.034***			-0.027**	-0.027***	
	(0.01)			(0.01)	(0.01)	
Time effect	NO	YES	YES	NO	NO	
Constant	49.654**	1.770*	2.536***	27.576	2675.287***	
	(19.29)	(0.94)	(0.56)	(17.10)	(905.16)	

Note: Standard errors in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01, 2204 observations, ⁱ⁾ inverse hyperbolic sine transformation of explanatory variables from HF and logarithmically transformed variables of world bank in PPML model, LN – logarithmic transformation, IHS – inverse hyperbolic sine transformation, Adjusted R^2 for M1 a M2 = 91.3 %.

1 ab. 2: Germany Gravity Model-Imports-world								
Imports	(1)	(2)	(3)	(4)	(5)			
	OLS (LN)	LSDV(LN)	PO	PPML i)	MRE (LN)			
Distance (LN)	-0.671***	-0.671***	-0.894***	-0.814***	-0.653***			
	(0.13)	(0.13)	(0.07)	(0.02)	(0.18)			
Real GDP (LN)	1.542**	0.000		0.905**	1.845***			
Germany	(0.69)	(0.00)		(0.41)	(0.48)			
Real GDP (LN)	1.099***	1.100***	0.883***	0.840***	0.941***			
Partner	(0.06)	(0.06)	(0.03)	(0.01)	(0.13)			
Free trade agreement (FTA)	0.042	0.038	0.089	0.145***	0.269**			
	(0.24)	(0.24)	(0.13)	(0.05)	(0.12)			
Customs union	-0.192	-0.182	-0.252*	-0.248***	-0.679***			
	(0.37)	(0.37)	(0.13)	(0.05)	(0.18)			
Economic Integration	-0.140	-0.146	0.103	0.047	-0.716***			
	(0.39)	(0.39)	(0.15)	(0.06)	(0.15)			
Border	0.646**	0.640**	0.228**	0.288***	0.579			
	(0.27)	(0.27)	(0.10)	(0.04)	(0.56)			
Business Freedom	-0.001	-0.002	-0.003	-0.274**	0.004*			
	(0.01)	(0.01)	(0.00)	(0.13)	(0.00)			
Trade Freedom	-0.009	-0.010	-0.003	-0.161**	0.002			
	(0.01)	(0.01)	(0.00)	(0.07)	(0.00)			
Fiscal Freedom	-0.003	-0.003	-0.009**	-0.410***	-0.004*			
	(0.01)	(0.01)	(0.00)	(0.10)	(0.00)			
Government Spending	0.011**	0.011**	0.007**	0.096***	0.002			
	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)			
Monetary Freedom	0.001	0.001	0.003	0.083	0.003*			
-	(0.01)	(0.01)	(0.00)	(0.05)	(0.00)			
Investment Freedom	0.000	-0.001	0.003	0.264***	0.001			
	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)			
Financial Freedom	-0.004	-0.003	-0.006**	-0.312***	-0.001			
	(0.01)	(0.01)	(0.00)	(0.08)	(0.00)			
Property Rights	0.008	0.008	0.008*	0.198**	0.005**			
	(0.01)	(0.01)	(0.00)	(0.09)	(0.00)			
Freedom Corruption	0.009	0.010	-0.003	0.065	0.003			
-	(0.01)	(0.01)	(0.00)	(0.09)	(0.00)			
Education	0.019**	0.019**	0.010*	0.635***	-0.008			
	(0.01)	(0.01)	(0.01)	(0.13)	(0.01)			
Control of Corruption	-0.010	-0.010	-0.021***	-0.721***	0.002			
	(0.01)	(0.01)	(0.01)	(0.08)	(0.00)			
Government Effectiveness	-0.004	-0.004	0.026***	0.983***	0.002			
	(0.01)	(0.01)	(0.01)	(0.14)	(0.00)			
Political Stability	0.004	0.004	0.012***	0.378***	0.009***			
5	(0.01)	(0.01)	(0.00)	(0.04)	(0.00)			
Regulatory Quantity	0.002	0.002	-0.004	-0.222**	-0.005			
	(0.01)	(0.01)	(0.01)	(0.11)	(0.00)			
Rule of Law	-0.003	-0.003	0.008	0.423***	-0.001			
	(0.01)	(0.01)	(0.01)	(0.09)	(0.00)			

Tab. 2:	Germany	Gravity	Model-im	ports-world
	•			

Voice and Accountability	0.011	0.011	-0.011***	-0.345***	-0.001
	(0.01)	(0.01)	(0.00)	(0.04)	(0.00)
Euro=1 (No Euro)	-0.662*	-0.688**	-0.291**	-0.257***	-0.717***
	(0.34)	(0.34)	(0.12)	(0.05)	(0.20)
Euro=2 (Euro Treaty)	0.430	0.416	-0.107	0.006	-0.079
	(0.26)	(0.26)	(0.11)	(0.06)	(0.18)
Euro=3 (Access phase)	0.206	0.171	-0.217***	-0.114**	-0.106
	(0.22)	(0.23)	(0.08)	(0.05)	(0.12)
Year	-0.055**			-0.009	-0.053***
	(0.02)			(0.01)	(0.02)
Time effect	NO	YES	YES	NO	NO
Constant	86.142**	-0.095	3.244***	5.704	2412.690
	(37.34)	(1.56)	(0.67)	(19.55)	(1558.87)

Note: Standard errors in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01, 2204 observations, ⁱ⁾ inverse hyperbolic sine transformation of explanatory variables from HF and logarithmically transformed variables of world bank in PPML model, LN – logarithmic transformation, IHS – inverse hyperbolic sine transformation, Adjusted R^2 for M1 a M2 = 80.4 %.

Tab. 3: Germany Gravity Model-exports-LA								
Exports LA	(1)	(2)	(3)	(4)	(5)			
	OLS (LN)	LSDV(LN)	PO	PPML i)	MRE (LN)			
Distance (LN)	-1.154*	-1.196*	-1.085	-1.345***	-1.154***			
	(0.60)	(0.60)	(0.73)	(0.39)	(0.35)			
Real GDP (LN)	0.371	0.000		0.599	0.371			
Germany	(0.64)	(0.00)		(0.46)	(0.77)			
Real GDP (LN)	1.094***	1.099***	1.039***	0.984***	1.094***			
Partner	(0.04)	(0.03)	(0.03)	(0.02)	(0.03)			
Free trade agreement (FTA)	0.014	0.036	0.178**	0.424***	0.014			
	(0.15)	(0.14)	(0.07)	(0.10)	(0.18)			
Business Freedom	0.006	0.005	-0.000	0.264**	0.006*			
	(0.00)	(0.00)	(0.00)	(0.12)	(0.00)			
Trade Freedom	0.002	-0.002	-0.003	-0.001	0.002			
	(0.01)	(0.01)	(0.00)	(0.16)	(0.00)			
Fiscal Freedom	0.001	0.003	-0.003	-0.555***	0.001			
	(0.01)	(0.01)	(0.00)	(0.21)	(0.00)			
Government Spending	0.010*	0.011*	0.003	-0.228	0.010***			
	(0.01)	(0.01)	(0.00)	(0.17)	(0.00)			
Monetary Freedom	-0.006***	-0.003	0.000	-0.061***	-0.006**			
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)			
Investment Freedom	-0.005	-0.005	-0.003	0.076	-0.005**			
	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)			
Financial Freedom	0.008*	0.009**	0.005**	-0.078	0.008***			
	(0.00)	(0.00)	(0.00)	(0.07)	(0.00)			
Property Rights	0.001	-0.001	-0.000	0.069	0.001			
	(0.00)	(0.00)	(0.00)	(0.06)	(0.00)			
Freedom Corruption	0.002	0.003	-0.002	0.050	0.002			
	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)			
Education	0.002	-0.001	0.002	0.561*	0.002			
	(0.01)	(0.01)	(0.01)	(0.32)	(0.00)			
Control of Corruption	-0.011**	-0.009**	-0.003	-0.053	-0.011***			
	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)			
Government Effectiveness	0.012	0.012	0.006	0.275**	0.012***			
	(0.01)	(0.01)	(0.00)	(0.11)	(0.00)			
Political Stability	0.009*	0.009*	0.008***	0.318***	0.009***			
	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)			
Regulatory Quantity	0.004	0.007	0.004**	-0.001	0.004			
	(0.01)	(0.01)	(0.00)	(0.08)	(0.00)			

Tab 3. C wity Model rte T A

D 1 61	0.001	0.005%	0.000	0.050	0.001
Rule of Law	-0.001	-0.005*	-0.002	0.059	-0.001
	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)
Voice and Accountability	0.010	0.010	0.009	-0.267	0.010**
	(0.01)	(0.01)	(0.01)	(0.20)	(0.01)
Year	0.001			-0.002	0.001
	(0.02)			(0.01)	(0.02)
Time effect	NO	YES	YES	NO	NO
Constant	-5.205	1.836	3.002	0.281	-5.205
	(37.50)	(5.41)	(6.37)	(23.07)	(38.57)
Observations	221	221	221	221	221
Adjusted R2	0.956	0.958			

Note: Standard errors in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01, 2204 observations, i) inverse hyperbolic sine transformation of explanatory variables from HF and logarithmically transformed variables of world bank in PPML model, LN – logarithmic transformation, IHS – inverse hyperbolic sine transformation, Adjusted R2 for M1 a M2 = 95.6 %.

Tab. 4: Germany Gravity Model-imports-LA									
Imports LA	(1)	(2)	(3)	(4)	(5)				
	OLS (LN)	LSDV(LN)	РО	PPML i)	MRE (LN)				
Distance (LN)	-0.801	-0.808	-0.262	0.002	-0.801				
	(0.83)	(0.78)	(0.59)	(0.44)	(0.61)				
Real GDP (LN)	1.295	0.000		2.420***	1.295				
Germany	(1.07)	(0.00)		(0.56)	(1.32)				
Real GDP (LN)	0.828***	0.838***	0.914***	0.894***	0.828***				
Partner	(0.06)	(0.07)	(0.04)	(0.03)	(0.06)				
Free trade agreement (FTA)	0.158	0.174	0.091	0.281*	0.158				
	(0.34)	(0.32)	(0.17)	(0.15)	(0.32)				
Business Freedom	0.001	0.001	0.001	0.112	0.001				
	(0.01)	(0.01)	(0.01)	(0.23)	(0.01)				
Trade Freedom	-0.032**	-0.039**	-0.010*	-0.168	-0.032***				
	(0.01)	(0.02)	(0.01)	(0.29)	(0.01)				
Fiscal Freedom	-0.008	-0.005	0.009	0.606**	-0.008				
	(0.01)	(0.01)	(0.01)	(0.28)	(0.01)				
Government Spending	0.007	0.007	-0.002	-0.692***	0.007				
	(0.01)	(0.01)	(0.01)	(0.20)	(0.00)				
Monetary Freedom	0.001	0.004	0.003	-0.058***	0.001				
	(0.01)	(0.01)	(0.00)	(0.02)	(0.00)				
Investment Freedom	-0.010*	-0.009	-0.001	0.094	-0.010**				
	(0.01)	(0.01)	(0.00)	(0.10)	(0.00)				
Financial Freedom	-0.012*	-0.010	-0.004	-0.124	-0.012**				
	(0.01)	(0.01)	(0.00)	(0.12)	(0.00)				
Property Rights	0.013*	0.012	0.011**	0.202*	0.013**				
	(0.01)	(0.01)	(0.00)	(0.11)	(0.01)				
Freedom Corruption	0.008	0.008	-0.004	0.080	0.008				
	(0.01)	(0.01)	(0.00)	(0.22)	(0.01)				
Education	0.010	0.007	0.017*	0.996**	0.010				
	(0.01)	(0.01)	(0.01)	(0.45)	(0.01)				
Control of Corruption	-0.010	-0.008	0.008	0.153	-0.010*				
	(0.01)	(0.01)	(0.01)	(0.13)	(0.01)				
Government Effectiveness	-0.011	-0.012	-0.024***	-0.321*	-0.011				
	(0.01)	(0.01)	(0.01)	(0.19)	(0.01)				

Political Stability	0.007	0.008	0.005	0.244***	0.007
	(0.01)	(0.01)	(0.01)	(0.07)	(0.01)
Regulatory Quantity	-0.008	-0.006	-0.005	-0.451***	-0.008
	(0.01)	(0.01)	(0.01)	(0.11)	(0.01)
Rule of Law	0.024*	0.022	0.012*	0.432***	0.024***
	(0.01)	(0.01)	(0.01)	(0.15)	(0.01)
Voice and Accountability	0.019	0.019	0.015**	0.335	0.019**
	(0.01)	(0.02)	(0.01)	(0.29)	(0.01)
Year	0.019			-0.024	0.019
	(0.05)			(0.02)	(0.04)
Time effect	NO	YES	YES	NO	NO
Constant	-52.634	4.714	-4.464	2.278	-52.634
	(99.01)	(6.94)	(4.76)	(29.23)	(66.05)

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Note: Standard errors in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01, 2204 observations, ⁱ⁾ inverse hyperbolic sine transformation of explanatory variables from HF and logarithmically transformed variables of world bank in PPML model, LN – logarithmic transformation, IHS – inverse hyperbolic sine transformation, Adjusted R^2 for M1 a M2 = 85.8 %.

Tab. 5: Czech Gravity Model-exports-world								
Exports	(1)	(2)	(3)	(4)	(5)			
	OLS (LN)	LSDV(LN)	PO	PPML i)	MRE (LN			
Distance (LN)	-1.241***	-1.247***	-1.385***	-1.401***	-1.111***			
	(0.12)	(0.12)	(0.12)	(0.04)	(0.15)			
Real GDP (LN)	0.918*	0.000		1.285**	1.321***			
Germany	(0.48)	(0.00)		(0.58)	(0.38)			
Real GDP (LN)	1.092***	1.095***	0.925***	0.885***	0.899***			
Partner	(0.05)	(0.05)	(0.05)	(0.02)	(0.14)			
Free trade agreement (FTA)	0.268	0.251	-0.544	-0.498***	-0.066			
	(0.23)	(0.23)	(0.38)	(0.15)	(0.15)			
Customs union	1.295***	1.252***	-0.424	-0.139	0.450**			
	(0.42)	(0.43)	(0.53)	(0.21)	(0.22)			
Economic Integration Agreement	-0.772**	-0.786**	0.263	0.102	-0.489**			
	(0.37)	(0.38)	(0.46)	(0.19)	(0.19)			
Business Freedom	0.009	0.008	-0.000	0.093	0.002			
	(0.01)	(0.01)	(0.01)	(0.25)	(0.00)			
Trade Freedom	0.009*	0.008	-0.005	0.048	0.005**			
	(0.00)	(0.01)	(0.01)	(0.16)	(0.00)			
Fiscal Freedom	0.019***	0.019***	0.018***	0.871***	0.001			
	(0.01)	(0.01)	(0.01)	(0.22)	(0.00)			
Government Freedom	-0.003	-0.002	-0.001	0.051	0.002			
	(0.01)	(0.01)	(0.00)	(0.04)	(0.00)			
Monetary Freedom	-0.008*	-0.007	-0.012***	-0.164***	-0.003			
2	(0.00)	(0.01)	(0.00)	(0.04)	(0.00)			
Investment Freedom	0.001	0.001	0.016***	0.584***	-0.002			
	(0.01)	(0.01)	(0.00)	(0.14)	(0.00)			
Financial Freedom	0.002	0.002	0.000	-0.053	0.007***			
	(0.01)	(0.01)	(0.00)	(0.14)	(0.00)			
Freedom Corruption	-0.010*	-0.010*	-0.006	-0.017	-0.008***			
*	(0.01)	(0.01)	(0.01)	(0.16)	(0.00)			
Control of Corruption	-0.000	-0.000	0.021	-0.262	-0.001			
*	(0.01)	(0.01)	(0.01)	(0.21)	(0.00)			
Government Effectiveness	0.009	0.009	0.009	0.813***	-0.001			
	(0.01)	(0.01)	(0.01)	(0.25)	(0.00)			
Political Stability	0.006	0.006	0.003	0.182***	-0.002			

	(0.01)	(0.01)	(0.00)	(0.07)	(0.00)
Regulatory Quantity	0.003	0.003	0.003	0.224	0.012***
	(0.01)	(0.01)	(0.01)	(0.23)	(0.00)
Rule of Law	-0.008	-0.008	-0.004	-0.144	0.002
	(0.01)	(0.01)	(0.01)	(0.20)	(0.00)
Voice and Accountability	0.012*	0.012*	-0.002	0.129**	0.010***
	(0.01)	(0.01)	(0.01)	(0.05)	(0.00)
Euro=1 (No Euro)	-0.051	-0.088	-0.272**	-0.214**	-0.060
	(0.23)	(0.23)	(0.13)	(0.09)	(0.25)
Euro=2 (Euro Treaty)	0.536	0.514	-0.221	-0.180	0.005
	(0.40)	(0.41)	(0.22)	(0.14)	(0.23)
Euro=3 (Access phase)	0.211	0.171	-0.066	-0.013	-0.173
	(0.23)	(0.24)	(0.20)	(0.12)	(0.14)
Year	0.003			0.013	0.029
	(0.02)			(0.02)	(0.02)
Time effect	NO	YES	YES	NO	NO
Constant	-18.177	-1.270	2.508*	-42.881	-2012.302
	(33.29)	(1.29)	(1.34)	(40.05)	(1547.93)

Note: Standard errors in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01, 2652 observations, ⁱ⁾ inverse hyperbolic sine transformation of explanatory variables from HF and logarithmically transformed variables of world bank in PPML model, LN – logarithmic transformation, IHS – inverse hyperbolic sine transformation, Adjusted R^2 for M1 a M2 = 80.7 %.

Tab. 6:	Czech	Gravity	Model-im	ports-world
		010110		

Imports	(1)	(2)	(3)	(4)	(5)
	OLS (LN)	LSDV(LN)	PO	PPML i)	MRE (LN)
Distance (LN)	-0.704***	-0.699***	-1.252***	-1.184***	-0.640***
	(0.11)	(0.11)	(0.13)	(0.04)	(0.14)
Real GDP (LN)	-0.199	0.000		0.878	-0.211
Germany	(0.41)	(0.00)		(0.58)	(0.30)
Real GDP (LN)	0.893***	0.893***	1.004***	0.917***	0.598***
Partner	(0.05)	(0.05)	(0.06)	(0.02)	(0.10)
Free trade agreement (FTA)	-0.688**	-0.668**	-1.865***	-1.671***	0.024
	(0.29)	(0.29)	(0.60)	(0.23)	(0.11)
Customs Union	0.891**	0.955**	-0.724	-0.435*	0.369**
	(0.39)	(0.39)	(0.71)	(0.25)	(0.17)
Economic Integration Agreement	0.450	0.460	0.757	0.471**	0.355**
	(0.37)	(0.37)	(0.63)	(0.23)	(0.15)
Business Freedom	-0.001	-0.000	-0.001	-0.044	0.008***
	(0.01)	(0.01)	(0.01)	(0.22)	(0.00)
Trade Freedom	0.005	0.006	-0.005	-0.037	-0.004**
	(0.00)	(0.00)	(0.01)	(0.13)	(0.00)
Fiscal Freedom	-0.020***	-0.020***	0.013	0.817***	-0.007***
	(0.01)	(0.01)	(0.01)	(0.23)	(0.00)
Government Freedom	0.006	0.006	0.008	0.102***	0.002
	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)
Monetary Freedom	-0.002	-0.003	-0.006	-0.144*	0.006***
	(0.00)	(0.00)	(0.01)	(0.07)	(0.00)
Investment Freedom	-0.000	-0.000	0.013***	0.508***	0.003**
	(0.01)	(0.01)	(0.00)	(0.13)	(0.00)
Financial Freedom	-0.005	-0.005	-0.002	-0.366**	-0.001
	(0.01)	(0.01)	(0.01)	(0.15)	(0.00)
Freedom Corruption	-0.007	-0.007	-0.003	0.016	-0.001
	(0.01)	(0.01)	(0.01)	(0.14)	(0.00)
Control of Corruption	-0.009	-0.009	-0.021*	-1.105***	0.000

	(0.01)	(0.01)	(0.01)	(0.14)	(0.00)
Government Effectiveness	0.022**	0.022**	0.043***	1.999***	0.010***
	(0.01)	(0.01)	(0.01)	(0.31)	(0.00)
Political Stability	0.008*	0.008*	0.014***	0.482***	-0.001
	(0.00)	(0.00)	(0.01)	(0.08)	(0.00)
Regulatory Quantity	-0.009	-0.009	0.002	-0.421*	0.007**
	(0.01)	(0.01)	(0.02)	(0.24)	(0.00)
Rule of Law	0.007	0.007	-0.001	0.520**	0.006**
	(0.01)	(0.01)	(0.01)	(0.23)	(0.00)
Voice and Accountability	0.008	0.008	-0.017***	-0.439***	-0.006**
	(0.01)	(0.01)	(0.01)	(0.07)	(0.00)
Euro=1 (No Euro)	0.106	0.163	-0.522**	-0.438***	-0.543***
	(0.35)	(0.35)	(0.21)	(0.10)	(0.19)
Euro=2 (Euro Treaty)	0.333	0.375	-0.210	-0.099	-0.366**
	(0.37)	(0.37)	(0.25)	(0.12)	(0.17)
Euro=3 (Access phase)	0.191	0.261	-0.335*	-0.177*	-0.115
	(0.24)	(0.24)	(0.17)	(0.10)	(0.11)
Year	0.002			-0.000	0.005
	(0.02)			(0.02)	(0.01)
Time effect	NO	YES	YES	NO	NO
Constant					
	-2.562	-1.250	0.992	-14.328	-424.136
euro== 1.0000	(36.77)	(1.27)	(1.32)	(41.67)	(1320.26)

Note: Standard errors in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01, 2579 observations, ¹⁾ inverse hyperbolic sine transformation of explanatory variables from HF and logarithmically transformed variables of world bank in PPML model, LN – logarithmic transformation, IHS – inverse hyperbolic sine transformation, Adjusted R^2 for M1 a M2 = 78.0 %.

Tab. 7: Czech Gravity Model-exports-LA							
Exports	(1)	(2)	(3)	(4)	(5)		
	OLS (LN)	LSDV(LN)	PO	PPML i)	MRE (LN)		
Distance (LN)	-0.971**	-1.038***	-0.500	-0.383*			
	(0.35)	(0.35)	(0.34)	(0.22)			
Real GDP (LN)	2.419	0.000		2.719***	0.878		
Germany	(1.58)	(0.00)		(0.84)	(0.88)		
Real GDP (LN)	0.909***	0.937***	0.934***	0.862***	0.532		
Partner	(0.07)	(0.08)	(0.06)	(0.07)	(0.38)		
Free trade agreement (FTA)	-0.105	-0.030	0.037	-0.024	0.682***		
	(0.37)	(0.35)	(0.11)	(0.11)	(0.25)		
Business Freedom	0.034**	0.033**	0.009	0.968**	0.017***		
	(0.01)	(0.01)	(0.01)	(0.45)	(0.01)		
Trade Freedom	-0.012	-0.018*	-0.010	0.359	0.005		
	(0.01)	(0.01)	(0.01)	(0.58)	(0.01)		
Fiscal Freedom	0.004	0.004	-0.000	0.077	-0.008		
	(0.02)	(0.02)	(0.01)	(0.56)	(0.01)		
Government Freedom	0.001	0.002	-0.013*	-1.356***	-0.001		
	(0.01)	(0.01)	(0.01)	(0.35)	(0.01)		
Monetary Freedom	-0.018**	-0.012	-0.006	-0.109***	-0.006		
	(0.01)	(0.01)	(0.01)	(0.04)	(0.00)		
Investment Freedom	0.009	0.010	0.022***	1.001**	0.007		
	(0.01)	(0.01)	(0.01)	(0.46)	(0.00)		
Financial Freedom	0.013**	0.015***	0.020***	0.593**	-0.002		
	(0.01)	(0.00)	(0.01)	(0.23)	(0.00)		
Property Rights	0.007	0.008	0.002	-0.286	-0.005		

(0.01)	(0.01)	(0.01)	(0.33)	(0.01)
0.008	0.005	-0.003	-0.170	-0.009
(0.01)	(0.00)	(0.01)	(0.30)	(0.01)
-0.019	-0.014	-0.012	-0.245	-0.003
(0.01)	(0.01)	(0.01)	(0.26)	(0.01)
0.031**	0.029**	0.004	0.550	0.015
(0.01)	(0.01)	(0.01)	(0.35)	(0.01)
0.020	0.023	0.028*	0.581***	0.001
(0.01)	(0.01)	(0.02)	(0.15)	(0.01)
-0.034*	-0.034*	-0.031*	-0.630**	-0.008
(0.02)	(0.02)	(0.02)	(0.27)	(0.01)
0.002	-0.002	0.004	0.079	0.005
(0.01)	(0.01)	(0.01)	(0.35)	(0.01)
0.015	0.013	0.020	0.271	0.007
(0.02)	(0.02)	(0.02)	(0.52)	(0.01)
0.030			0.021	0.050
(0.06)			(0.04)	(0.04)
NO	YES	YES	NO	NO
-93.001	-1.744	-4.620	-87.138	-130.924*
(106.68)	(3.43)	(3.30)	(61.24)	(79.24)
	(0.01) 0.008 (0.01) -0.019 (0.01) 0.031** (0.01) 0.020 (0.01) -0.034* (0.02) 0.002 (0.01) 0.015 (0.02) 0.030 (0.06) NO -93.001 (106.68)	$\begin{array}{cccccc} (0.01) & (0.01) \\ 0.008 & 0.005 \\ (0.01) & (0.00) \\ -0.019 & -0.014 \\ (0.01) & (0.01) \\ 0.031^{**} & 0.029^{**} \\ (0.01) & (0.01) \\ 0.020 & 0.023 \\ (0.01) & (0.01) \\ -0.034^{*} & -0.034^{*} \\ (0.02) & (0.02) \\ 0.002 & -0.002 \\ (0.01) & (0.01) \\ 0.015 & 0.013 \\ (0.02) & (0.02) \\ 0.030 \\ (0.06) \\ NO & YES \\ -93.001 & -1.744 \\ (106.68) & (3.43) \\ \end{array}$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

Note: Standard errors in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01, 272 observations, ¹⁾ inverse hyperbolic sine transformation of explanatory variables from HF and logarithmically transformed variables of world bank in PPML model, LN – logarithmic transformation, IHS – inverse hyperbolic sine transformation, Adjusted R^2 for M1 = 79.6 and M2 = 80.1 %. MRE – distance dropped because of the small sample properties of dataset

Tab. 8:	Czech	Gravity	Model-imports-LA	1
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Imports	(1)	(2)	(3)	(4)	(5)
	OLS (LN)	LSDV(LN)	PO	PPML i)	MRE (LN)
Distance (LN)	-0.985	-0.966	-2.679***	-3.157***	
	(0.58)	(0.60)	(0.51)	(0.65)	
Real GDP (LN)	1.837	0.000		2.224**	-0.764
Germany	(1.88)	(0.00)		(1.12)	(1.22)
Real GDP (LN)	0.860***	0.865***	1.042***	0.937***	-0.170
Partner	(0.17)	(0.19)	(0.14)	(0.07)	(0.52)
Free trade agreement (FTA)	0.562	0.489	0.072	0.096	1.146***
	(0.43)	(0.44)	(0.25)	(0.14)	(0.35)
Business Freedom	0.031*	0.030	0.049***	2.740***	0.018*
	(0.02)	(0.02)	(0.02)	(0.75)	(0.01)
Trade Freedom	-0.023**	-0.019	0.001	0.470	-0.011
	(0.01)	(0.01)	(0.01)	(0.84)	(0.01)
Fiscal Freedom	-0.007	-0.009	-0.015	0.059	-0.000
	(0.02)	(0.02)	(0.01)	(0.74)	(0.01)
Government Freedom	-0.000	-0.001	-0.016	-1.757***	-0.000
	(0.01)	(0.01)	(0.01)	(0.54)	(0.01)
Monetary Freedom	-0.000	-0.003	-0.006	-0.023	0.002
	(0.01)	(0.01)	(0.00)	(0.05)	(0.01)
Investment Freedom	0.025*	0.025*	0.063***	3.187***	0.013**
	(0.01)	(0.01)	(0.01)	(0.76)	(0.01)
Financial Freedom	0.008	0.008	0.012	0.692***	0.005
	(0.01)	(0.01)	(0.01)	(0.23)	(0.01)

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Property Rights	-0.025*	-0.021	-0.029**	-1.545***	-0.011
	(0.01)	(0.01)	(0.01)	(0.41)	(0.01)
Freedom Corruption	-0.011	-0.011	-0.026*	-0.613*	-0.011
	(0.01)	(0.01)	(0.01)	(0.36)	(0.01)
Control of Corruption	0.008	0.007	0.035***	1.562***	0.005
	(0.02)	(0.02)	(0.01)	(0.49)	(0.01)
Government Effectiveness	0.017	0.018	-0.008	0.265	0.013
	(0.01)	(0.02)	(0.02)	(0.49)	(0.01)
Political Stability	0.042***	0.042***	0.041***	0.447*	0.022**
	(0.01)	(0.01)	(0.02)	(0.24)	(0.01)
Regulatory Quantity	-0.014	-0.018	-0.024	-0.062	0.006
	(0.02)	(0.02)	(0.02)	(0.36)	(0.01)
Rule of Law	0.001	0.003	-0.003	-0.622*	-0.020**
	(0.01)	(0.02)	(0.01)	(0.34)	(0.01)
Voice and Accountability	-0.012	-0.009	0.014	0.897	-0.005
	(0.02)	(0.02)	(0.02)	(0.84)	(0.01)
Year	-0.131			-0.160***	-0.018
	(0.08)			(0.05)	(0.06)
Time effect	NO	YES	YES	NO	NO
Constant	239.801	-0.087	10.516**	288.916***	16.143
	(140.82)	(6.37)	(5.36)	(91.10)	(109.61)

Note: Standard errors in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01, 271 observations, ⁱ⁾ inverse hyperbolic sine transformation of explanatory variables from HF and logarithmically transformed variables of world bank in PPML model, LN – logarithmic transformation, IHS – inverse hyperbolic sine transformation, Adjusted R^2 for M1 = 64.6 and M2 = 64.0 %. MRE – distance dropped because of the small sample properties of LA dataset.

Official definitions from the World Bank of Government Indicators

1. Voice and Accountability (VA)

capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.

2. Political Stability and Absence of Violence/Terrorism (PV)

capturing perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. The capacity of the government to effectively formulate and implement sound policies:

3. Government Effectiveness (GE)

capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

4. Regulatory Quality (RQ)

capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. The respect of citizens and the state for the institutions that govern economic and social interactions among them.

5. Rule of Law (RL)

capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.



6. Control of Corruption (CC)

capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

Summary Statistics of the gravity model								
Summary statistics German Gravity model – world								
Variable	Obs	Mean	Std. Dev.	Min	Max			
Exports	2204	4503.94	12253.42	0.5	101496			
Distance	2204	5702.13	3619.00	378	18220			
Gdprealger	2204	2103358.00	264088.30	1599679	2458943			
ERDI	2204	1.84	0.72	0.447	4.706			
Gdprealdef	2204	262851.10	936869.20	298	1.16E+07			
Free Trade Agreement	2204	0.10	0.31	0	1			
Customs Union Economic Integration	2204	0.12	0.32	0	1			
Agreement	2204	0.15	0.36	0	1			
Common Border	2204	0.05	0.22	0	1			
Business Freedom	2204	64.94	16.30	10	100			
Trade Freedom	2204	68.03	15.83	0	95			
Fiscal Freedom	2204	71.65	14.63	0	99.9			
Gov't Spending	2204	65.80	23.32	0	99.3			
Monetary Freedom	2204	73.00	15.50	0	94.3			
Investment Freedom	2204	52.52	20.40	0	95			
Financial Freedom	2204	52.28	21.13	9.3	90			
Property Rights	2204	49.46	24.86	0	95			
Freedom Corrupt	2204	42.42	24.16	4	100			
Education	2204	62.52	20.38	9.54	100			
Control of Corruption	2204	49.89	29.42	0.49	100			
Gvt. effectiveness	2204	51.13	29.08	0.49	100			
Political Stability	2204	46.93	28.51	0.47	100			
Regulatory Quantity	2204	48.60	29.15	0.47	100			
Rule of Law	2204	51.67	28.69	0.49	100			
Voice and Accountability	2204	48.21	29.01	0.47	100			
Euro	2204	1.20	0.53	1	3			
Year	2204	2004.59	4.44	1996	2011			

Summary statistics German Gravity model – world -Latin America

Variable	Obs	Mean	Std. Dev.	Min	Max
Exports	221	1015.34	1958.602	9.8	11107
Imports	221	659.5476	1200.737	4	6938.5
Year	221	2004.538	4.458354	1996	2011
Distance	221	10001	1041.246	8290	12267
Gdprealger	221	2100241	265316	1599679	2458943

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Gdprealdef	221	227867.4	376886.2	9223	1760365
Free Trade					
Agreement	221	0.081448	0.274143	0	1
Business					
Freedom	221	63.57059	9.577312	47.8	87.3
Trade Freedom	221	71.01765	8.413388	51	88
Fiscal Freedom	221	80.73484	6.470135	64.8	97.6
Gov't Spending	221	81.3914	10.40838	45.8	99.2
Monetary					
Freedom	221	72.4819	12.21955	0	94.3
Investment					
Freedom	221	58.41629	16.94184	5	90
Financial					
Freedom	221	57.37557	14.15464	20	90
Property Rights	221	43.30317	18.04523	0	90
Freedom					
Corruption	221	35.29864	14.2469	10	75
Education	221	63.34525	10.21557	33.08	80.6
Control of					
Corruption	221	43.44443	22.7148	2.44	92.2
Gvt. effectiveness	221	45.48747	19.84489	9.76	87.8
Political Stability	221	35.8614	19.59122	0.96	82.21
Regulatory					
Quantity	221	36.27421	20.92777	1.41	89.47
Rule of Law	221	50.30018	20.6583	4.31	96.57
Voice and					
Accountability	221	52.06376	15.76831	24.17	89.42

Summary statistics Czech Rpublic Gravity model – world

Variable	Obs	Mean	Std. Dev.	Min	Max
Exports	2657	345.1191	1828.305	0.000018	37482.1
Imports	2584	353.3493	1741.232	0	32108.22
Distance	2705	5679.741	3694.438	276.3035	17985.78
Gdprealger	2705	169339.3	32866.73	116050.4	213270.1
Gdprealer	2705	262651.8	905903.3	102.2516	1.16E+07
Free Trade Agreement	2705	0.057301	0.23246	0	1
Customs Union	2705	0.075416	0.26411	0	1
Economic Integration					
Agreement	2705	0.100185	0.300302	0	1
Business Freedom	2703	64.81669	16.07409	10	100
Trade Freedom	2703	66.72619	16.39945	0	95
Fiscal Freedom	2703	70.63134	15.24615	0	99.9
Gov't Spending	2703	65.67447	23.74883	0	99.3
Monetary Freedom	2703	72.15638	16.73369	0	95.4
Investment Freedom	2703	52.78076	20.3655	0	95
Financial Freedom	2703	51.69745	21.05721	9.3	90
Property Rights	2703	50.26308	24.93424	0	95
Freedom Corrupt	2703	42.39593	24.53202	4	100
Control of Corruption	2705	50.10484	29.54855	0.49	100



Gvt. effectiveness	2705	51.13824	29.15826	0.49	100
Political Stability	2705	46.94231	28.51234	0.47	100
Regulatory Quantity	2705	48.60452	29.26907	0.47	100
Rule of Law	2704	51.70134	28.75561	0.49	100
Voice and					
Accountability	2705	48.26099	29.09911	0.47	100
Euro	2703	1.18535	0.507034	1	3
Year	2705	2003.557	4.614725	1995	2011

Summary statistics Czech Rpublic Gravity model – world - Latin America

Variable	Obs	Mean	Std. Dev.	Min	Max
Exports	272	20.0844	45.02403	0.013573	315.3627
Imports	271	16.62695	30.88495	0.00061	236.4753
Distance	272	9443.52	2287.4	4075.183	12551.78
Gdprealger	272	168808.3	33043.38	116050.4	213270.1
Gdprealer	272	220957	366175.9	8591.308	1649262
Free Trade					
Agreement	272	0.066177	0.249049	0	1
Business					
Freedom	272	64.00404	9.764048	47.8	87.3
Trade Freedom	272	70.2636	8.168712	51	88
Fiscal Freedom	272	80.77868	6.471013	64.8	97.6
Gov't Spending	272	81.8625	10.47649	45.8	99.3
Monetary					
Freedom	272	72.02941	12.89018	0	95.4
Investment					
Freedom	272	60	16.29977	5	90
Financial					
Freedom	272	57.97794	14.16662	20	90
Property Rights	272	45	17.72587	0	90
Freedom					
Corruption	272	35.53676	14.43852	10	79
Control of					
Corruption	272	43.16375	22.81069	2.44	92.2
Gvt.					
effectiveness	272	45.76654	19.78865	9.76	87.8
Political Stability	272	36.28757	19.45662	0.96	82.21
Regulatory					
Quantity	272	36.61614	20.53186	1.41	89.47
Rule of Law	272	51.55985	20.15641	4.31	96.57
Voice and					
Accountability	272	52.06585	15.47071	24.17	89.42
Year	272	2003.478	4.644509	1995	2011