Theses of the Doctoral Dissertation (Ph.D.)

Analysis of Foreign Trade of the 6 Largest Latin American Countries Using Gravity Model

Pöstényi Andrea

Thesis advisor: Dr. Erdey László

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1. Preface of the doctoral research

The countries of the Latin American continent possess numerous similar economical, political and historical traits, if we look at the years of colonization and subsequent exploitation, the secession pursuits and the rise of different dictatorships; in our present days however, we can see significant differences between these countries. The motivation of my research was to find these differences and explain the reasons behind them, that is why I chose to do my research on the two main influential factors of the economy and economic development: trade and institutions.

In the last decades the continent experienced periods of booms and recessions as a result of modernization attempts: by the 1970s it was clear that the attempt of *dessarrollismo[1]* failed in all Latin-American countries, the 1980s can be marked as the "lost decade", and afterwards slow stabilization started in the 1990s as a result of structural reforms. Spectacular economic progress was made in the 2000s due to an exceptional economic environment and implemented internal reforms, which was only ended by the global economic crisis of 2007-2009 *(Anderle 2010)*.

In the second half of the 20th century, as a result of agreements within the GATT / WTO framework, and the bilateral and plurilateral trade agreements, and unilateral opening up of trade, customs and non-tariff trade barriers experienced a substantial decline, in parallel with which the world trade grew in unprecedented proportions. In the meanwhile developing countries started to play a greater role in world trade and the Latin American region occupies a privileged position among them. However, significant differences can be discovered between the Latin American countries regarding trade size, direction, and the diversity of products traded.

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[1] This modernization attempt involved efforts made in order to restructure the economies, alleviate the dependency on foreign capital and world economy, reduce the gap formed in society and modernize the agriculture *(Anderle 2010:129)*.

2. Objectives of the doctoral dissertation

According to the preface I investigate in detail the institutional background that determines the economic opportunities for the Latin American region and the evolution of these institutions, highlighting the economic development of the 6 major economies in the region: Argentina, Brazil, Chile, Colombia, Mexico and Peru. The research examines in detail the structure and changes in trade in the Latin American region over the past nearly 60 years, placing more emphasis on the factors impacting the bilateral export during the empirical analysis.

The main research questions of my doctoral dissertation are: (i.) which factors determine the export of the LAC-6 countries; (ii.) how much these factors differ between these countries and from the world average; (iii.) and how regional trade agreements influence international trade.

My main aim during the research was to present a new and complex – more comprehensive than previous studies – analysis regarding the economic development and evolution of trade in the Latin American region. Conclusions coming from the analysis can later be translated and applied not only for the economies in the Latin American region, but for other emerging markets as well being in similar stages of development especially when making economic or trade policy related decisions.

My goal is, starting from the theoretical and empirical literature, to conduct such a comprehensive empirical investigation regarding the trade of the LAC-6 countries which presents and analyses the influential factors on trade from many aspects, highlighting the impact of regional trade agreements. During the empirical analysis I present several sensitivity tests with the aim of providing more accurate conclusions to be drawn from the results.

Phases of the doctoral research were presented in conferences and were published in reviewed journals in order to reach the scientific community. During teaching and thesis advising activities my goals were to have the developing regions and their economic development better known among the students as well; I encouraged them to investigate the topic further.

3. Structure and applied methodology

After stating the objectives and goals of the doctoral research in the preface, in Chapter 2 I present the evolution of the economic development and institutions in Latin America, starting from the effects of colonialism and independence, through the crisis and reforms of the 1980s as well as the fiscal turning point of the 2000s to the present. Chapter 3 presents trends in the world trade from the 1960s to the global economic crisis of 2007-2009, pointing to the changes in global balance of power, and the factors influencing world trade in the post-crisis period. Descriptive statistical presentation of Latin America's foreign trade will take place in Chapter 4, after the presentation of the region's place in the world trade I discuss the main trading partners and products traded, as well as the role of trade agreements and intraregional trade.

The theory of the gravity model of trade is described in Chapter 5, presenting the major milestones in the development of the model starting from the well-known equation in physics through theoretical foundations of the seventies until. Chapter 6 contains a summary of the empirical gravity literature to provide an overview of the empirical results on the major factors influencing trade in order to be comparable with the results of the dissertation research. Chapter 7 presents my own empirical analysis on the trade of the LAC-6 countries, after presenting the data and model specifications I analyze the trade of the LAC-6 countries by country and then the 6 countries together; after running several sensitivity tests I further investigate the impact of trade agreements on trade and finally I present the results for trade potentials. Chapter 8 states the propositions of the dissertation and concludes the main results of the research, and Chapter 9 suggests further directions for the research.

As a first step in research I revised both the Hungarian and international economic literature which on the on hand contributed to obtain the theoretical basis of the topic, on the other hand provided a good base to select the correct model specifications and econometric methods during the empirical analysis. Studying the publications of the World Trade Organization, ECLAC, World Bank and IMF were of help to understand the tendencies behind the economic changes.

Economic data used in the research were obtained from databases of World Bank, UN Comtrade, ECLAC Cepalstat and CEPII. Descriptive statistics was used in the chapters preceding the empirical gravity analysis, economic and trade tendencies were depicted using Excel. For the gravity analysis STATA IC statistical package was used, a panel analysis was carried out on the trade of the LAC-6 countries, country, time and country-pair specific dummy variables were added to the model in case the number of observations allowed the model expansion.

The research primarily focuses on Latin America, more specifically the LAC-6 countries, the empirical study analyses data of 18 years, for the period between 1995 and 2012. After analyzing the export of the LAC-6 countries by country, analysis of the region as a whole is carried out, and then several sensitivity tests are run. In order to draw more accurate conclusions the model is amended by all countries' data for which data were available for the whole research period. This amended model allows us to capture the welfare effects of the regional trade agreements. I conclude the empirical study by comparing the predicted data to the actual data, which provides an opportunity to observe trade potentials.

4. Propositions of the dissertation

Economic development in Latin America was essentially influenced by the institutions implemented at the era of colonization, which led to a substantial fall behind the leading economies of the world by the beginning of the industrial revolution. After independence, modernization took off at the fastest rate in temperate countries, e.g. Argentina, Chile and Uruguay, while much slower reform measures occurred in Brazil, Peru and Mexico thanks to the ruling elite striving to restore the colonial conditions. Due to the evolving political stability and the favorable external economic conditions thanks to the industrial revolution, countries in Latin America started to achieve high growth rates, which could cover the institutional weaknesses of these countries for a long time.

Despite the import substitution industrialization implemented after World War II, the Latin American region could achieve exceptionally high economic growth in the period of 1945-1981 with an average growth rate of 5.2 per cent, while growing debt, inflation and corruption, i.e. the absence and weakness of political and economic institutions made the region vulnerable to external shocks. A good example for this vulnerability was the crisis of the 1980s which started in Mexico and then spread through the entire continent resulting in a decade of stagnation, which induced institutional changes of similar importance to those of the independence. After the outbreak of the crisis, more than a decade of reform measures took place, which seemingly improved the vulnerability of the region, however, the crises of the next decade (1994: Mexico, 1998: Brazil, 2001: Argentina) highlighted the weaknesses of these countries. It should be noted, however, that unlike the crisis in the 1980s, from the 1990s the reaction of the governments to crises was to deepen market reforms, accelerate privatization plans, fine-tune foreign exchange regime and strengthen private banks as opposed to measures taken in the 1980s in order to have greater control over the economy. Since the early 2000s, fiscal policy rules and countercyclical fiscal policy spread across the continent as part of a new wave of reform measures, which resulted in significant economic stability and growth, and more resilience to external economic shocks.

Overall, it can be said that the Latin American region was very vulnerable to external shocks due to unstable political leadership and weak institutions, banking and currency crises often spread to other countries in the region and could affect these economies for several years. The reforms adopted after the crisis of the 1980s did not prove to be sufficient to

provide economic stability, as was proved by the crises of the next decade in Mexico, Brazil and Argentina.

> **Thesis 1.**: Due to accelerated reform measures in the 2000s and learning from previous crises, such an institutional environment evolved in Latin America that have made the economies in the region resilient enough to overcome the negative effects of the global economic crisis of 2007-2009 without going through the usual banking or currency crisis, and moreover, to achieve growth after the crisis well ahead of developed nations.

However, in the post-crisis era deteriorating economic data – see e.g. economic downturns in Brazil and Venezuela – pointed out that the Latin American region still seems to be vulnerable to the permanent weakness in the global economic performance.

Latin America's trade policy has come a long way over the last few decades: export-oriented policies gradually took over the import substitution industrialization, and then emphasis increased on joining vertical value chains. After the era of import substitution industrialization significant trade opening was made, trade liberalization was achieved through the institutional framework of GATT/WTO on multilateral basis, by signing bilateral and plurilateral trade agreements, and by unilateral trade opening as happened in e.g. Chile and Mexico. Parallel with the trade liberalization not only the number and value of products traded increased, but notable changes occurred in the ranges of import and export products as well as in the importance of trading partners. In addition, these developments were greatly affected by other countries' trade opening, such as the East Asian countries.

> **Thesis 2.** The composition of export products of the Latin American countries has greatly changed in the last decades due to the greater engagement in world trade: while the traditionally commodities exporter countries increased their manufactured goods export share to an average of 40 per cent by the millennium, by the end of the 2000s Latin American commodities export share increased again to 60 per cent (70 per cent in case of LAC-6) which was last reached at the end of the 1980s. Behind all these changes are the deepening trade relations with China and the increasing commodity prices during the 2000s.

Basically, it is beneficial to a developing region if they can gear their exports toward a country with remarkable economic and trade growth, as China was until the early 2010s. However, today this strong trade relationship is somewhat responsible for the deteriorating trade data of the Latin American region, since the slowdown in the Chinese economic growth and import demand has a negative impact on the exports of the LAC region. Although both the drop in the Chinese import demand, as well as the worsening Latin American export data could prove to be temporary, it would be advisable for the region to strengthen the diversity of its export markets and export products in order to achieve a more balanced foreign trade and protect against long-term negative effects. During this process significance of regional export markets should not be underestimated.

The Latin American region is often treated as a single entity in relation to the common linguistic, historic and institutional roots; several regional economic agreements were signed in pursuit of achieving a single region, these agreements focused on closer trade and economic cooperation among the member states. Despite this, an indicator of the economic relationship within a region, the level of intraregional is significantly lower compared to other regions, such as the European Union or the East Asian region *(Curran-Zignago 2013; Aminian et al. 2009)*. Although, in terms of number of products exported the Latin American region is the most important trading partner for the Latin American countries, regarding the trade volume intraregional markets reach a very low level, 18-20 per cent of total trade on average. The Central American region is an exception to this rule, for these countries the level of intraregional trade is twice as much as the Latin American average, while 3 of the LAC-6 countries, Argentina, Peru and Colombia have a higher intraregional share in their total trade than the Latin American average.

> **Thesis 3.:** Considering that other dynamically developing and developed regions have a much higher level of intraregional trade in total trade than in Latin America, and that high technology content products are mostly traded at intraregional markets, there is a great trade potential for the Latin American countries to increase their trade with each other.

The trade policy changes and the proliferation of trade agreements after World War II triggered a proliferation in the number of theoretical and empirical models evaluating trade as well. One of the most important and empirically most successful models of these is the gravity model of trade. The basic gravity model tries to explain the volume of trade between

two countries or regions by their economic size and distance. The augmented or extended gravity model contains other variables as well (e.g. common language, common border, historical ties, trade agreement etc.) which can be also important at explaining the volume of trade. The gravity model became popular in the last 30 years for being a quite simple instrument at explaining trade patterns; the values predicted by the model fit the data quite well, while the R square usually ranges from 60 to 80 percent.

As the name of the model suggests, the gravity model of trade derives from the gravity model known from physics. In 1687, Isaac Newton formulated the law of universal gravitation, in which the size of the gravitational interaction is proportional to the multiplication of the weight of the two interacting objects and is inversely proportional to the square of their distance *(Head 2003)*. *Ravenstein (1889)* applied the gravity model first outside the science of physics, although at that time the model was not formalized. In his paper, he examined migration patterns in the 19th century across Europe and America, and realized that the movement of people across countries is very similar to those described by the gravity model in physics.

Almost a century later, it was *Jan Tinbergen (1962)* who used the gravity model for the first time for assessing trade, he concluded that the most determining factors of the optimal level of trade are the size of the two countries (GNP) and the distance between them. The economic size of the importing country reflects the size of the country's demand and the diversity of its products. Regarding these two effects we expect a smaller than unity effect of economic size on trade since the more diversified the products produced are in a given country, the less import it will need, i.e. parallel to the increase in the importer countries GNP, *ceteris paribus* the volume of its imports will increase by less than unity. The economic size of the exporter country reflects its ability to produce export products, and thus the increase of GNP in the exporter country will also increase the volume of its trade. The geographical distance affects trade since the shipment of goods between countries is costly. In addition, the more a product is moved, the more costs incur regarding transportation, therefore geographical distance has a negative impact on imports. Following the work of *Tinbergen (1962)* several empirical studies – such as *Linnemann (1966)* and *Aitken (1973)* – applied the gravity model of trade; however, these models did not have sound theoretical foundations.

More than a decade passed without a theoretical foundation of the gravity model of trade, and it was *Anderson (1979)* who could solve this issue. The gravity model of *Anderson (1979)* is the following:

$$M_{ijk} = \propto_k Y_i^{\beta_k} Y_j^{\gamma_k} N_i^{\varepsilon_k} N_j^{\epsilon_k} d_{ij}^{\mu_k} U_{ijk} \,, \tag{1}$$

where M_{ijk} the flow of good or factor k from country or region i to country or region j expressed in dollar, Y_i and Y_j are the income of country or region i and j, N_i and N_j are the population of country or region i and j, d_{ij} is the distance between country or region i and j, while U_{ijk} is a lognormally distributed error term with an expected value of 0. According to the gravity equation, bilateral trade depends on the economic sizes and the bilateral barriers between country or region i and j. Considering given bilateral trade barriers, the higher the barriers between j and its other trading partners, the more the reduction in the relative price of products from country i, and thus the import from country i increases. Based on the gravity equation, trade between two countries are determined by the *relative trade barriers*: bilateral trade depends on the relationship of bilateral barriers between these two countries and the average trade barriers with other trading partners. This average trade barrier is called *multilateral resistance*. Trade is more important for smaller countries, therefore trade barriers have a greater impact on their multilateral resistance *(Anderson-van Wincoop 2001)*.

After the appearance of the theoretical foundations, the gravity model of trade became the most successful empirical method of foreign trade analyses. Empirical analyses focused on factors influencing trade, such as borders (*McCallum (1995); Wei (1996); Anderson-van Wincoop (2001); Mayer-Zignago (2005)*), factor endowment (*Rahman (2003)*; *Schumacher (2003)*; Sohn (2005); *Eicher et al. (2012)*; *Shirotori et al. (2010)*), common language and colonial linkages (*Hutschinson (2002); Head et al. (2010); Oh et al. (2011); Felbermayr-Toubal (2006); Martinez-Zarzoso (2003)*); institutions and corruption (*Anderson-Marcouiller (2002); de Groot et al. (2004)*); free trade agreements and regional integrations (*(Martinez-Zarzoso (2003); Baier-Bergstrand (2007); Carrere (2006); Soloaga- Winters (2001); Jugurnath et al. (2007); Coulibaly (2009); Anderson-Yotov (2011); Rose-van Wincoop (2001); Vicard (2009); Frankel-Wei (1998)*).

In order to draw further conclusions regarding the foreign trade of the Latin American countries, and to determine the main influencing factors of the exports of the LAC-6 countries, a more comprehensive, econometric analysis was needed. The empirical analysis was carried out using the below gravity equation:

$$lnExport_{ijt} = \alpha_0 + \alpha_1 \ln GDP_{it} + \alpha_2 \ln GDP_{jt} + \alpha_3 \ln DIST_{ij} + \alpha_4 \ln POP_{it} +$$
$$\alpha_5 \ln POP_{jt} + \beta_1 \, CONT_{ij} + \beta_2 \, COMLANG_{ij} + \beta_3 \, COLONY_{ij} + \beta_4 \, FTA_{ijt} + e_{ijt} \tag{2}$$

where $Export_{ijt}$ is export of country i to country j in year t, GDP_{it} and GDP_{jt} are economic sizes of country i and j in year t, POP_{it} and POP_{jt} reflect the population of country i and j in year t, and $DIST_{ij}$ is the bilateral distance. Regarding the dummy variables, $CONT_{ij}$ is the common border; $COMLANG_{ij}$ is the binary variable that represents common language. $COLONY_{ij}$ reflects the former colonial relationship, its value is 1 in case country i was the colony of country j and zero otherwise. FTA_{ijt} captures the common trade agreements in year t. Country, time and country-pair specific dummy variables were added to the model in order to capture those factors influencing trade that the above equation do not control for, and to control for multilateral resistance in order to acquire less biased results.

The empirical analysis section starts with the analysis of foreign trade of the LAC-6 countries by country, and then by increasing the number of observation and using fixed effect binary variables I continued with the analysis of the trade of the LAC-6 countries as a whole. I carried out several sensitivity tests by splitting the data into OECD and non-OECD trading partners and then by applying a global sample. The results of these model specifications contribute to drawing more accurate conclusions on the trade of the LAC-6 countries and the Latin American region.

During the analysis of the LAC-6 countries by country remarkable differences could be detected regarding the size, sign and significance of the coefficients of the explaining variables. While a 1 per cent increase in the GDP of Argentina induces *ceteris paribus* less than a 1 per cent increase in its bilateral exports, the other 5 analyzed countries experience an increase in bilateral exports of more than 1 per cent. The effect of bilateral distance on trade has also different impacts on the LAC-6 countries: a 1 per cent increase in the bilateral distance for Argentina, Chile and Peru induces less than 1 per cent decrease in bilateral exports, while for Brazil the value of the coefficient is above unity, and for Colombia and Mexico the decrease is even higher, bilateral exports decrease by 1.6 per cent. Similar differences can be detected regarding the coefficients of the dummy variables as well, although no further conclusions should be drawn based on the size of these variables due to possible omitted variables bias.

> **Thesis 4.:** Considering the results of the analysis on trade of the LAC-6 countries using descriptive statistics and econometric methods, the Latin American region can be considered as heterogeneous; according to the empirical gravity analysis great differences exist in the influencing factors of the exports of the LAC-6 countries.

Analysis of the LAC-6 countries as a whole allowed for further model expansion to control for time, country and country-pair specific fix effects and to carry out sensitivity tests by splitting the data into OECD and non-OECD countries. Controlling for country-and-time specific effects, considering two evenly spaced countries the LAC-6 countries will export *ceteris paribus* more to an OECD country, while having a common language and common border has also the same effect in favor of the OECD country. The opposite effect prevails in case of the common trade agreement: LAC-6 countries will export more to a non-OECD country, i.e. a non-OECD country favors the export of the LAC-6 countries in case they signed a trade agreement.

Comparing the results of the empirical analysis, the most notable difference is in the effect of the common language variable. While the expanded model and the empirical literature found a positive relationship between common language and the level of bilateral exports, for the LAC-6 countries the effect is negative even when controlling for country-and-time specific effects, which again refers to the low level of intraregional trade.

> **Thesis 5.:** In case of the LAC-6 countries, having a common border does not have a positive effect on bilateral exports, while these countries trade *ceteris paribus* more with importer countries in which the official language is other than Spanish or Portuguese.

During the 20th century, movement and transportation between geographical locations became easier, faster and cheaper thanks to technological developments; these changes continue in the 21st century as well due to developed transportation and communication devices. Empirical studies prove that the decreasing effect of distance on trade has fallen thanks to the above mentioned developments *(Brun et al 2012)*, however this fall – as well as the negative effect of distance – differs by country and region, which was supported in the empirical results of my study as well.

> **Thesis 6.:** Based on the analysis on the foreign trade of the LAC-6 countries and the results of several sensitivity tests, an important conclusion can be drawn: foreign trade of the LAC-6 countries is way more sensitive to bilateral distances than the global average.

Bilateral distance captures transportation costs between countries, thus according to my empirical results the LAC region faces greater transportation costs than the world average. It is well known that for decades competitiveness in Latin America has been hindered by infrastructural weakness which not only refers to the electricity or water supply, but also the number and quality of roads, highways, railways and ports (see for example, *Gonzalez et al 2007*). Based on the above, we can conclude that if the LAC-6 countries manage to significantly improve the state of their infrastructure, they could not only achieve significant economic growth in the region through enhanced competitiveness, but due to the growth of bilateral exports as well.

Expanded global data allows us to analyze the effects of free trade agreements – a factor with ever greater importance considering trade policy. The binary variable capturing the effect of FTAs used in previous model specifications was replaced by integration variables, the new integration variables were created by integration according to *Carrere (2006)*, 3 dummy variables per integration capture the intra-RTA and the extra-RTA effects. Considering the empirical results, 3 integrations outside the Latin American region, the EU, EFTA and ASEAN were proved to be welfare enhancing, these results agree with the conclusions of other empirical studies (*Martinez-Zarzoso (2003); Jugurnath et al (2007); Barbalet et al (2015); Rose-van Wincoop (2001); Geldi (2012); Coulibaly (2009); MacPhee-Sattayanuwat (2014); Guilhot (2010)*), which proves that my model specification was well defined.

> **Thesis 7.:** Among the integrations containing Latin American countries only NAFTA shows signs of positive welfare effects for all the countries in the sample, the Andean Community has only positive welfare effects for the member states, while in case of Mercosur and CACM the intra-integration welfare effect is insignificant, but they have negative effect on trade with third countries.

Rethinking is needed on operation of regional integrations based on my empirical gravity results, since positive welfare effects are not guaranteed by these integrations. Significant welfare benefits could evolve through closer economic and political cooperation and more efficient institutions. For example, common agricultural policies could lead to economies of scale, while common transnational infrastructure investments could significantly reduce transportation costs between member states. The Latin American region could follow the example of numerous successful integrations – such as the European Union and the ASEAN –

on efficient economic and political cooperation, which would not only lead to direct welfare benefits, but could also increase the global weight of the region.

5. Further directions of research

5.1. Latin America and trade in services

My dissertation focused on trade in goods, while nowadays the share of services in global trade is ever increasing, therefore for future research it would be worth investigating the differences in the service exports between Latin America and other regions, as well as the differences in the influential factors of trade in goods and trade in services.

Trade in services has reached a considerably high level in the last 20 years. While trade in goods reached very low levels after the economic crisis of 2007-2009 compared to the pre-crisis period, global trade in services could grow steadily. According to data of *WTO (2015)* export in services grew by 5.5 per cent in 2013 reaching 4.7 trillion dollar which is 20 per cent of total global exports. In the last decade strong growth in exports of services occurred thanks to Asian and Latin American countries, the share of developing countries in global service exports increased from 23 per cent to 30 per cent between 2000 and 2013. Considering this, the Latin American region has a significant potential in services exports.

Francois and his co-authors (2007) pointed out that the reason behind the low number of empirical studies on trade in services is the availability of data regarding services-related trade flows and trade policy. Considering that services are intangible factors, trade barriers are not the same as in case of goods, and it is really hard to account for various types of non-tariff barriers.

Kimura and Lee (2006) analyzed trade in goods and services of 10 OECD countries using gravity model and found that the gravity model suits data of services better – having a higher R square – than in case of trade in goods. Another interesting difference between trade in goods and trade in services is that trade in services was found to be more sensitive to geographical distance than in case of trade in goods. In addition, although regional trade agreements mainly focus on trade in goods, their effects on trade in services are of a similar extent.

Walsh (2008) used Hausman-Taylor method instead of random models and analyzed trade in services by disaggregating services to 4 categories: governance, travel, transportation and other services. According to his results, trade in services is mainly determined by the economic size of the exporter and importer countries and the existence of a common language. In contrast with the results of Kimura and Lee (2006) he found that the effect of bilateral distance on services is insignificant, while the same impact prevails for the EU membership and common border as well.

Miroudot and his co-authors (2013) found that trade costs related to services are much higher than in case of trade in goods, and the difference could reach two or threefold, moreover, these trade costs do not show any signs of a decreasing trend. In addition, however bilateral trade in services within a regional integration faces less barriers, but this effect is small and decreases over time.

World Bank, IMF and several other international institutions created databases for data on trade in services due to the data availability problems, comprehensive analyses similar to trade in goods could be carried out by the availability of more accurate data on increasing number of countries for increasing number of periods.

5.2. Latin America and FDI

The last 3 decades have witnessed a strong increase in global FDI thanks to the spread of multinational companies, global FDI increased by almost 3000 per cent between 1982 and 2010 *(UNCTAD 2010)*, the high growth level dropped in 2009 due to the economic crisis of 2007-2009, and then it reached a growth rate similar to that of the pre-crisis period by 2011. In addition, the share of developing countries in host countries has increased dynamically since the 1990s. For example, FDI flowing to Latin America accounted for 4 per cent of the global FDI in 1990, and then it reached 10 per cent by 2011. Nowadays most FDI to the region flows to Brazil, Chile, Mexico, Colombia and Peru, while most outward investment comes from Chile Mexico, Colombia, Argentina and Venezuela *(UNCTAD 2015)*.

Forte and Santos (2015) used cluster analysis in their study on FDI in Latin America. According to their results, the Latin American region can be divided into 3 distinct clusters regarding investment attraction factors, the most successful cluster – controlling for economic size – consists of Chile, Paraguay, Uruguay and Costa Rica. *Williams (2015)* used panel

method to determine whether the investment attraction factors differ in Latin America from the rest of the world. In his study he found that for the Latin American countries infrastructure has a bigger impact on FDI than for the rest of the world, while high debt level has a bigger negative impact for the rest of the world.

Several empirical studies prove that the gravity model used in analyzing foreign trade patterns can be also applied to analyze foreign direct investments (see for example *Egger-Pfaffermayr (2004); Bergstrand-Egger (2007); Bevan-Estrin (2004); Ledyaeva-Linden (2006); Kleinert-Toubal (2010); Paniagua et al (2015)*). Regarding the Latin American region, for example *Subasat and Bellos (2015)* carried out an empirical gravity analysis; their aim was to determine the relationship between FDI attraction and the quality of governance. Their surprising conclusion was that poor governance and corruption are positively correlated to FDI inflows, although this impact is small, therefore we could draw the conclusion that good governance does not have a significant role in attracting FDI. This positive relationship can be explained by the fact that most FDI comes from rich countries who invest in poorer countries with abundant natural resources, and who tend to have poorer institutions.

Data availability is significantly better for FDI than in the case of trade in services, World Bank, United Nations, OECD and CEPAL provide databases, analyses and statistical studies as well which can greatly contribute to research in this field.

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7. Publications of the Candidate

Pöstényi, A. (2011): Chile és a világgazdasági válság. Competitio, X. évfolyam, 1. szám, június, 132-146. o.

Pöstényi, A. (2012): A fiskális politika vizsgálata a PaCifiCa országaiban. Competitio, XI. évfolyam, 2. szám, december, 109-126. o.

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Pöstényi, A. (2017): A LAC-6 országok exportjának vizsgálata gravitációs modellel. Statisztikai Szemle. Accepted by Publisher.

Erdey, L. – Pöstényi, A. (2017): Determinants of Exports of Hungary: Trade Theory and the Gravity Model. Acta Oeconomica. Accepted by Publisher.

Conference lectures

2013. November Conference of University of Debrecen, Faculty of Economics and Business Administration, Debrecen, Lecture: Role of Insitutions in the Economic Development of Latin America.

2014. July „SSEM EuroConference 2014: The International Conference on Emerging Markets, Business, Economics, and Finance" scientific conference, Budapest, Budapest University of Technology and Economics. Lecture: Determinants of Foreign Trade of Hungary: Trade Theory and the Gravity Model.

Candidate: Andrea Pöstényi
Neptun ID: PYQZHV
Doctoral School: Doctoral School of Economics
MTMT ID: 10036714

List of publications related to the dissertation

Articles, studies (5)

1. **Pöstényi, A.**: A LAC-6 országok exportjának vizsgálata gravitációs modellel.
   Statisztikai Szemle. [Accepted by publisher], 2017. ISSN: 0039-0690

2. Erdey, L., **Pöstényi, A**.: Determinants of Exports of Hungary: Trade Theory and the Gravity Model
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3. **Pöstényi, A.**: Role of Institutions in the Economic Development of Latin America
   In: Institutions, globalizations and trade. Ed.: Erdey László, Kapás Judit, Debreceni Egyetem Közgazdaság- és Gazdaságtudományi Kar, Debrecen, 50-68, 2014. (Competitio könyvek, ISSN 1785-5950 ; 14.), ISBN: 978-963-473-725-4

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5. **Pöstényi, A.**: Chile és a világgazdasági válság.
   Competitio. 10 (1), 32-146, 2011. ISSN: 1588-9645.

List of other publications

Conference presentations (1)

6. Erdey, L., **Pöstényi, A.**: Determinants of Foreign Trade of Hungary: Trade Theory and the Gravity Model

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