National Research University

Higher School of Economics

International College of Economics and Finance

Diploma Thesis

On a topic:

"Uneven Influence of the WTO on Countries and Their Trade"

Student of the 4th course, group №2

Evgeniya M. Rukavishnikova

Scientific Supervisor Ph.D,

Assistant Professor of Economics

Roman L. Zakharenko

Moscow, 2013

Всемирная Торговая Организация является одной из самых значимых и влиятельных структур в мире. Число стран, находящихся в ВТО, в 2013 году составило 159. Эта цифра составляет от 64% до 84% от общего количество стран (в зависимости от данных по количеству стран в мире). Безусловно, процесс вступления и участия в этой организации является определяющим в дальнейшей жизни страны и именно в этом заключается актуальность исследования неравномерного влияния ВТО на развитые и развивающиеся страны.

Как и ее предшественник ГАТТ, ВТО определила развитие и рост торговли своей первичной целью. Именно для этого был создан принцип «Наиболее Благоприятствуемой Нации», который обязывает все страны в составе ВТО применять одинаковый уровень тарифов на различные товары для всех своих торговых партнеров. Кроме того, правила организации включают в себя предоставление льгот развивающимся странам и оказание им помощи в решении целого ряда вопросов. Однако, в реальности развитые страны оказываются в более привилегированных условиях, проводя политику «защитного протекционизма». Результатом этого стали завышенные импортные тарифы в богатых странах и заниженные в бедных и развивающихся, что и стало одной из ключевых причин различий эффектов ВТО.

Главной целью данной работы является исследование различного влияния Всемирной Торговой Организации на развитые и развивающиеся страны с помощью изучения уже существующих работ и созданных эконометрических моделей.

Для достижения цели были поставлены следующие задачи:

1. Изучить историю ВТО, ее основные принципы и правила;
2. Проанализировать преимущества и недостатки от вступления в ВТО;
3. Рассмотреть различия для развитых и развивающихся стран и выделить основные сферы влияния благодаря научным источникам и собственному эконометрическому анализу.

Исследование проводилось с помощью вариации гравитационной модели и регрессий, оцененных с применением процедуры взвешивания параметров. В качестве зависимых переменных использовались импорт и экспорт, а также их модификации. Эконометрический анализ подтвердил гипотезу о неравномерном влиянии ВТО на развитые и развивающиеся страны.

Данные были получены с помощью баз Международного Валютного Фонда, Всемирного Банка, UN Comtrade, а также CEPII.

Contents

Introduction **4**

1.The World Trade Organization **6**
1.1 History of the WTO 6
1.2 The Basic Principles and Goals of the WTO 7
1.3 The Operational Structure of the WTO 9
1.4 The Future of the WTO 10

2. World Trade Organization Accession **11**
2.1 The Main Steps and Their Features 11
2.2 Why countries join the WTO? Advantages and Disadvantages 13
2.3 Difference of the WTO Influence for Developed and Developing Countries 17

3. Analysis of Research Papers and Existing Models **21**

4. Research and Econometric Analysis **27**
4.1 Empirical Study. Part I: Gravity Model 27
4.2 Empirical Study. Part II 31

Conclusion **38**

References **40**

Results **43**
Gravity model 43
Cross-section weights model 48

Appendices **52**

Introduction

The World Trade Organization is one of the most important and affluent structures in the world. Currently it has 159 members, which generates from 64% to 84% of the whole number of existing countries or territories. The percent varies due to the fact that some countries are not recognized as independent states and, for example, the United Nations has 193 countries in its list. As the successor of the General Agreement on Tariffs and Trade (GATT) the WTO continues its operation and manages the international trade relationships and all issues connected with this topic. The main declared goal of the organization is to promote trade for its members while providing assistance to countries, contributing to the development process, regulating foreign economic relations and solving trade disputes. The accession process and the "game" according to the implemented rules are the inevitable parts of all countries in the XXI century.

The significant role of trade dependence has been studied for many years. There is an indicator that shows the importance by the values of total trade (the sum of exports and imports) divided by the Gross Domestic Product (or sometimes Gross National Product). Usually small countries (or countries with low population) have high trade dependence, which can reach the level of 90%. Developing countries are usually more export-oriented.[1]

The significance of the international trade and the unchanged situation during several decades are the main stimulus of the research as joining the WTO as well as being its participant has uneven effects on developed and developing countries. Different researches tell us that rich countries have a lot more benefits than poor ones.

The main purpose of this work are the examination of the WTO influence, the analysis of its key differences for developed and developing countries and the empirical results that will confirm my hypothesis of unequal effects.

For the successful accomplishment of the goal following steps were made:

1. Insight into the history of the WTO, its principles and rules;
2. Study of the accession process;
3. Analysis of the asymmetry between developed and developing countries;
4. Consideration of existing models of the WTO effects on trade and countries;

[1] *Mikic M.*, Commonly Used Trade Indicators: A Note, ARTNeT Capacity Building Workshop on Trade, 2005

5. Estimation of the influence and disparity between developed and developing countries with econometrical models.

Two econometric models were used in my analysis. The first one was based on bilateral trade and the gravity model. The second model showed the effect on imports and exports and its modifications.

The results of both models coincide with my hypothesis as the influence of the WTO differs for developed and developing countries and their trade.

1.The World Trade Organization

1.1 History of the WTO

In order to get the full understanding of the WTO influence and how it promotes trade in developing and developed countries the more precise definition of the organization, its structure, approaches and aims should be given.

The idea of formation of some international organization, the mail goal of which would be the control of international trade, takes its roots from the Second World War. However, the process itself was quite long and hard and required a lot of modifications until the WTO was established and got the look we are all familiar with. In 1944 during the Bretton Woods conference with the help of the USA and the United Kingdom the International Bank for Reconstruction and Development (IBRD) and the International Monetary Fund (IMF) were set up. One more important result was the new economic mainstay: International Trade Organization. The international conference in 1996 in Havana was dedicated to trade and employment. The statute and formal regulations (necessary substantive laws) were proposed. Most of them were connected with the decrease in tariffs, the simplification of the international trade process and the easing of the customs burden for goods making their way from one country to another.

In 1947 General Agreement on Tariffs and Trade was signed. Initially it was considered as only a part of the broad-based agreement on new international trade organization. Quite unexpectedly, Congress refused to ratify the statute of the ITO (despite the fact that the USA was the main driving force of this organization). As a result GATT acted as an independent unit without any strong base.

During the years GATT showed itself as a quite dual system, which was able to reduce the customs duty from 40% in the mid 40s to almost 4% during the mid 90s. The significant part of GATT were systematically conducted trade rounds between countries-members. The goal of such meetings was the reduction of explicit customs duties and hidden non-tariff barriers on imports from abroad. The first round "Geneva" started on April 1946 with 23 countries and ended 7 months later with the signing of GATT and 45,000 tariff concessions. The last (which ended the life of GATT) took effect on September 1986 and lasted 87 months with the participation of 123 countries. The disputes consisted not only of tariff and non-tariffs measures but also of intellectual property, textiles, agriculture. The main outcome of this round became the creation of the WTO in 1994[2]. Member countries came to a consensus regarding trade of goods regulation. Moreover, due to the increasing role of services in the

[2] The full information about rounds and its results can be found in Appendix

postindustrial society and its significant share in the world trade the new agreement was established. It was called "General Agreement on Trade in Services" (GATS) and addressed issues of this sphere of international trade.

It is important to note that within this Marrakesh agreement (which gave birth to the WTO and GATS) went through the intellectual property agreement – TRIPS. Agreement on Trade-Related Aspects of Intellectual Property Rights controls trade issues connected with rights on creations of the mind (inventions, arts, literature and etc.) and nowadays is considered the essential part of the legal base of the WTO.

Thus, after almost 50 years of failed attempts to form international organization and the existence of the transitional GATT system from January 1st 1995 the WTO took up the reins.

1.2 The Basic Principles and Goals of the WTO

After the deep analysis of different literary sources together with the official information of the WTO organization I would like to briefly outline 5 main rules of the international organization.

1) The discrimination in the trading sphere is unacceptable. This can be combined with the "Most Favoured Nation" treatment (no discrimination for trading partners). It says that if the country grants another country a "special favour (such as a lower customs duty rate for one of their products)" it has to do the same for all other countries-members of the WTO.[3] Countries are not eligible to infringe on the rights of other countries while imposing any restrictions on exports and imports. The ideal situation can be described as the one where domestic market of any country makes no distinctions between conditions for domestic and foreign products. However, in the reality there is a rule about restrictions and protectionism, which partly contradicts this principle.

2) Minimization of trade barriers. In other words this rule describes all factors that can possibly decrease the potential of the domestic market penetration of any foreign goods. Firstly, these barriers are any customs duties and imports quotas. Besides international trade is under an influence of administrative factors and politics of the exchange rates.

3) Permanence and stability of trade conditions. Foreign investors, governments and companies need some feeling of certainty that in the short-term or long-term perspective all terms and conditions of trade deals won't be violated or changed unexpectedly.

4) Maintenance of competitive stimulus. In order to observe fair trading and competition the use of all "unfair" methods of the competitive struggle should be crushed in the bud. For

[3] wto.org (Principles of the trading system)

example, export subsidies, dumping prices result in takeovers of new segments of the market or market channels overall. All these activities should be stopped and controlled.

5) Exemptions for less developed or developing countries. This principle is in contradiction with other rules listed above as there are certain privileges provided by the WTO for these countries and it is considered fair as especially developing countries find it really hard to compete with developed strong economies at first. This principle is necessary as it ensures involvement of weak undeveloped countries. This rule is quite promising for the developing countries. However, in the reality the situation is a little bit different. The analysis of the problem and its reasons will be provided later.

One of the important goals of the WTO is the settling of disputes and the mediation in trade negotiations. Experience has proven that the best way to solve international economic conflicts is to make decisions according to the established procedure of the WTO, which is based on the mutually agreed juridical base and which provides equal rights and opportunities to all countries-members. Decisions are made by all participating countries and the consensus method used in the process plays the role of the additional stimulus to the strengthening of relations and harmony in the organization. It can be considered an important difference from many others international organizations (the World Bank, International Monetary Fund) where the power is delegated to the board of directors or the organization's head.

This all brings us to the discussions of the main functions of the WTO. They are:

- The control of the fulfillment of the basic agreements;
- The formation of conditions for proper negotiations between member countries concerning issues of foreign economic relations;
- The settlement of disputes connected with trade and economic relations. It is important to know that several years ago several European countries as well as the USA tried to include working conditions to the list of topics under the government of the WTO. However, developing countries were against this change as they considered this rule as the cause of decreased welfare of workers together with the fall in workplaces, incomes and, generally, competitiveness level;
- The control of politics of participating countries and their behavior while dealing with international trade issues
- Assistance and efforts in favour of developing countries;
- Cooperation with other international organizations.[4]

[4] *Горбунова О.А., Миченкова И.В. "*ВТО. Основы функционирования и проблемы присоединения России". Дашков и Ко, 2009, с.152

1.3 The Operational Structure of the WTO

The decisions of the highest level and strategic nature are made by the Ministerial conference. This conference is conducted minimum once a year. General Council that is in its submission is responsible for the performance of the current work. It gathers several times a year in headquarters in Geneva with the participation of all countries. Moreover, it controls two departments: first deals with the analysis of trade policy and the second one controls trade disputes. Special committees are also under the authority of the General Council. They tackle the issues of finance, restrictions on trade balances, trade and its development and administrative questions. [5]

The General Council also deals with the main disputes and has the exclusive authority to form arbitral groups with the aim of the analysis of conflicts, approval of reports and speeches as well as keeping under observancy the execution of decisions and recommendations and implementing sanctions in case of their non-execution.

The General Council partially delegates its functions to three other councils, which appear one step below according to the official hierarchy of the WTO. These are Council for Trade in Goods, Council for Trade-Related Aspects of Intellectual Property Rights.

Council for Trade in Goods controls the operation of the specialized committees that are in charge of the WTO principles fulfillment and the execution of GATT goods agreements. Council for Trade in Services manages the performance of the GATS agreements. The treaty consists of the Committee on trade in financial services and the Working group on professional services. Council for Trade-Related Aspects of Intellectual Property Rights regulates the execution of the TRIPS agreement as well as prevents trade conflicts, which are caused by the trade of counterfeit goods.

The Secretariat of the WTO in Geneva has almost 500 regular employees. Its head is the director general. The Secretariat doesn't have the power of making decisions because as we know it is given to the member countries. Among the main obligations of the Secretariat there are provision of technical support to various councils and committees as well as the convention of the Ministerial conference, provision of technical assistance to developing countries, the conduction of the world trade review together with computation of its indicators and the communication with the public and the mass media. Moreover, the Secretariat provides some forms of legal aid to the countries that wish to join the organization. Today

---

5 *Rukavishnikova E.,* ICEF Course Work: International Trade, the WTO and the Impact on Russia, 2012,p. 25-29

there are 25 countries that are considered observer governments. [6]

1.4 The Future of the WTO

The future of the WTO is quite an urgent topic. Some believe that will show its strength, others see several key problems of the institution, which may prevent it from developing and only structural reforms can improve the situation. Let's look at the statistical data, which shows the volume of world trade and GDP for the period between 2005-2013.[7] The changes can be seen on the figure 1.1. It should be noted that the values in 2013 are only predicted values.

Figure 1. The growth of average export and GDP in 2005-2013

According to the figure the volume of the world trade increased by 5% after the peak rise by 13.8% in 2010. Although before this there was record decrease of the world export by 12% in 2009 (counted from the times of the Second World War). Nowadays we can observe the increase in the export volume by 3.7%, which is smaller than the average level for the last 20 years (5,5%) by 1.5 times. The WTO predicts that the size of the global economy will expand in 2013 by 2.1%. The value is a little bit smaller than the same indicator in 2012 (2.4%). It can be as some kind of a sign of a recession that is not going to stop in the nearest future.

The recession in the euro zone was one of the main threats in 2012 that influenced world trade. Together with the government debt crises, the decrease in raw materials prices and geopolitical risks it deteriorated the trade volume. The WTO was formed by developed countries, which thought that economic freedom in international trade plays the role of the collateral for economic growth and the increased welfare of the society. However, now there exist a lot of other alternatives of external economic relations (for example, bilateral relations between regions).

---

[6] *Sutirin S.F.* WTO: The Mechanism of National Economy Interactions: Threats and Opportunities in Conditions of the International Market Accessio. Eksmo, 2008

[7] http://www.wto.org/english/news_e/pres12_e/pr658_e.htm#chart1

2. World Trade Organization Accession

2.1 The Main Steps and Their Features

Let's examine the mechanism of the accession itself together with its main steps. The members of the WTO can be any separate customs territories and any countries of the world. As on March 6th 2013 the WTO has 159 participating countries. About 30 countries are on different stages of negotiations, which are connected with their future potential participation in this international organization. Most of countries in the past were the members of GATT. These countries form the "founding members" of the WTO and have somehow different rights and conditions, which we will discuss later. The process of the accession itself is often different and is based on different conditions, which are discussed by the member countries as well as the new states that would like to become a part of the WTO. It's also important to note that about two thirds of the members are developing or least developed countries. On the graph 2.1 you can see the number of participating countries, which are subdivided by developed, developing and least developed ones.

Table 1 Countries-members of the WTO by years, Source: wto.org, worldbank.org, Author's calculations

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003
Number of countries	112	128	132	133	135	140	143	144	146
Joined during the year	36	16	4	1	2	5	3	1	2
Joined developed countries	5	2	0	0	1	1	0	0	0
Joined developing countries (excluding LDC)	17	6	3	1	1	4	3	1	2
Joined LDC countries	14	8	1	0	0	0	0	0	0

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of countries	148	149	149	151	153	153	153	153	157	159
Joined during the year	2	1	0	2	2	0	0	0	4	2
Joined developed countries	0	1	0	0	0	0	0	0	0	0
Joined developing countries (excluding LDC)	0	0	0	2	1	0	0	0	2	2
Joined LDC countries	2	0	0	0	1	0	0	0	2	0

In the table all countries are divided by three categories. However, usually in the analysis only two types are used: developed and developing countries. It is important to say that actually all LDC countries are the part of developing countries. Let's discuss the main differences of all three types and what main features each of them has.

A developed country "is a sovereign state that has a highly developed economy and advanced technological infrastructure relative to other less developed nations." (wikipedia.org) Usually in order to determine the degree of economic development gross domestic product (GDP), the per capita income, level of industrialization, amount of widespread infrastructure or general standard of living are used. Developed countries are on the stage of post-industrial economies (they are specialized in service sector more than in the industrial one). On the contrary, developing countries are only in the process of industrialization and quite often they are almost entirely agrarian. According to the World Bank countries are divided with the use of their Gross National Income (GNI) per capita per year. Countries have a GNI of US$ 11,905 and less in 2010 are defined as developing ones.[8] The WTO itself doesn't classify countries as members announce their decisions by themselves.

Least developed countries in the WTO are taken from the classification of the United Nations. In order to be considered least developed a country must satisfy 3 criteria:

1. low-income criterion calculated on the basis of three years the average estimate of GNI per capita (gross national income), which should be lower than $750 and above $900 on order to graduate;
2. a human resource weakness criterion, which uses Human Assets Index made of nutrition, health, education, adult literacy;
3. an economic vulnerability criterion that involves a composite Economic Vulnerability Index (EVI) based on agricultural products, population (its reduction because of disasters and logarithm value that should show the problem of economic smallness), exports and its deviations, the percent of manufacturing and modern services in Gross Domestic Product.[9]

The process of the accession is very complicated and can take a lot of time. The shortest period was for Kyrgyzstan and lasted for 2 years and 10 months. The longest ones were experienced by Russia and took 19 years and 2 months, Vanuatu (17 years and 1 month) and China (15 years and 5 months). The average time of accession is about 5 years. Everything

[8] The International Statistical Institute (www.isi-web.org)
[9] www.un.org

depends on the position of the observer country and a huge amount of negotiations and commitments can be undertaken before all conditions will be satisfied.

The first step is the request made by the government. It has to present a memorandum, which will show all aspects of trade and economic policy that is connected with the WTO agreements. The memorandum is the base for a detailed analysis of the request within a special working party. The government also conducts negotiations with interested governments that are current members of the organization. During these negotiations all goods obligations and trade-offs of an applicant show up as well as obligations regarding the service market. This period of bilateral discussions is also essential for estimating benefits for member countries, which they will get from the new state. After the consideration of a trade regime of the observer state and negotiations about market accession are finished the working party lists the key conditions of joining the WTO. In the conclusion the General Council and or the Ministerial conference announce the implications of the working party, which are made as a substantive report, a project protocol of the joining procedure and agreed lists of obligations and trade-offs. In the case when two thirds of the participating countries agree with these documents then the applicant can sign the protocol and join the WTO after the ratification of this document by a parliament or another legislative organ if applicable.

2.2 Why countries join the WTO? Advantages and Disadvantages

Generally speaking, the participation in the WTO as in any other international organization has its advantages and disadvantages. The official cite shows and briefly outlines a variety of pluses: peace, disputes, rules, cost of living, choice, incomes, growth and jobs, efficiency, lobbying and good government. The same is written about developing countries with the additional benefits such as longer transition periods and technical assistance. However, not everything is so simple and clear as member countries suffer from the trade-offs they have to admit and unequal conditions.[10]

Studies and researches made on the topic of developed and developing countries usually examine the benefits of accession from two sides: business enterprises that export goods and services and affairs that import raw materials, goods and services, which are necessary for the production of export goods.

In order to prevent potential changes in trade of goods almost all customs duties of developed countries and the significant part of developing countries' tariffs (as well as tariffs of countries with transitional economy) are interrelated. This "tying-up" provides the stability

[10] wto.org

and the situation when the easy access to a market (made available because of decreased tariffs) will not be violated as the consequence of the sudden rise in duties or of the establishment of new restrictions by importing countries. Obligations regarding services are also restricted by the limits of conditions and engagements that are recorded in the national list of obligations.

The system of the WTO guarantees the stability of access to export markets as the organization requires the same rules on the boarder for all participants. These rules help exporters to eliminate different standards that appear on different markets and make the life of producers much harder. Apart from this, the guaranteed access to markets gives exports industries an opportunity to form expectations for investment and production plans with the higher degree of certainty.

Generally speaking, many developing countries of Latin America, South-East Asian and East Asian countries were able to increase the industrial production as well as exports. As the result their economies grew quite rapidly with the help of market opportunities of developed countries. The World Bank analysis of the developing countries has showed that the share of countries has significantly increased and its future perspective is also quite delightful. As we can see from the figure below the proportion of international trade generated by developing countries was only 22% in 1980. However, there has been a gradual growth (of 23% for 50 years) and the predicted value of 2030 is 12.15 trillion of dollars made only by developing countries, which is 45% of the whole volume of trade in this year.

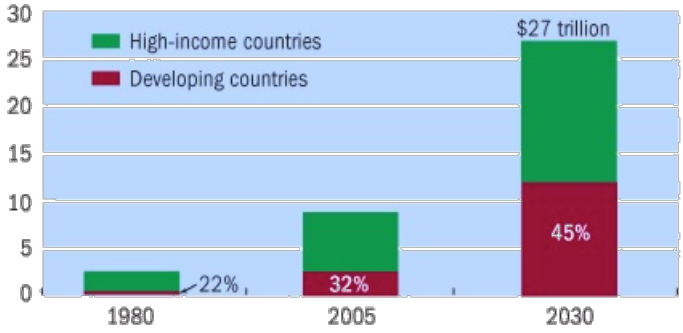


Figure 2 Total exports of developed and developing countries (US $). Source: worldbank.org

The legal system of the WTO also secured the rights for entrepreneurs. These rights can be divided into two parts. The first one consists of the rights, which domestic producers and importers get with respect to the government. The second one involves the rights of producers-exporters regarding the protection of their interests in the cases when governments of countries-importers try to decrease their exports volumes. As the result, the decrease in barriers with the aim of free exchange of goods ensures economic benefits. Moreover, the

WTO system positively influences politico-social atmosphere in countries-members of the organization and consequently by this increases the welfare of an individual citizen. Apart from this, the growth of export of domestic production is an impulse to the rise of the income of producers. The higher income results in higher tax revenues that in their order increase the welfare of a country. Of course, this chain works only in the ideal situation and in many developing countries because of their political system people don't see the increased level of welfare. [11]

While talking about the welfare it's important to note that the benefit of free trade is the decreased level of the cost of living, which happens not only because of decreased values of imported goods due to lower barriers but also because of reduced prices on domestic goods the production of which uses imported components. Another advantage is the expanding variety of available goods and services. It makes the choice much wider.

If we talk about the rise of the government income then it should be said that the operation of companies-exporters help to redistribute received additional resources and provide help to domestic companies, which face a dangerous level of foreign competition, as well as expand the volumes of production and development of firms-exporters' competition.

Long-term effects are represented by the increase in the employment level. This change dominates in industries that deal with export.

The trade and economic situation are inseparably connected with political system. The free trade has several positive results in this sphere. The government has more potential to resist the lobby groups and their actions as the trade policy is conducted according to the interest of economy in the whole.[12] Besides, free trade is the key reason for more balanced decisions of political matter, the struggle with corruption and the effective changes in the legislative branch. All these fact will positively affect the investment inflow to the country.

Finally, the country, which enters the WTO, gets the right to vote and participate in trading disputes while acting with respect to its national interests. As there are 159 countries now in the WTO and this number generates more than 90% of the world international trade this chance to be a part of it is important in order to develop and improve the reputation of a country in the world as well as to establish strong trade and political relations.

Even though there are many advantages from the WTO accession there also quite many disadvantages. Let's list and examine them while simultaneously making distinctions for

[11] *Царева А.Б.* "Интеграция российской экономики в ВТО" . Внешнеторговое право,2009 №5. С. 4-10.

[12] *Шувалова М.А.* "Проблемы и перспективы России при вступлении в ВТО" . Экономика России: XXI век., 2010 № 5(296). С. 16-23.

developed and developing countries. Many people consider the WTO organization fundamentally undemocratic and not so transparent as it is presented. Not so many industries and their interest are taken into account and affect trade negotiations. Many disputes are made exactly for corporations and provide the most beneficial conditions only for this "group" of a country. Various labour organizations as well as consumers, environmental problems and human rights are quite often partly or completely ignored. As there is also inequality in the conditions and participation rights of different countries mostly developed and rich ones have advantages from the free trade while other ones become less and less safe and their power decreases. We've already discussed that joining the WTO increases competition and variety (which is a good thing) but it also is a stimulus for a reduction in wages or "race to the bottom" as it is called by specialists. Workers get worse conditions instead of international labour standards promised to them. There is also a problem with a child labour as rules of the WTO do not control it and governments do not forbid goods that are produced with the work of children. Once again human rights are also not identified anywhere, which is a great minus as the behaviour of companies and labour conditions are not under control in some countries or not under the necessary attention and consideration.

One more drawback is the privatization as many essential services (energy, water and education) by the rules of the GATS should be made private. These are "elder and child care, sewage, garbage, park maintenance, telecommunications, construction, banking, insurance, transportation, shipping, postal services, and tourism"[13] . There are about 160 services in the list. Generally speaking, all of them should be given to private foreign corporations and some countries already implement these rules, which can be destructive to a high share of population.

Other problems also include the environment. As many rules and laws that tried to improve the situation were cancelled. For example, "US Clean Act" that forced domestic and foreign producers to use cleaner gasoline and the "Endangered Species Act", which tried to save some animals were eventually abolished. Thus, nature and its resources are under the danger.

The WTO membership also weakens economic sovereignty and the government cannot make decisions only by itself. As a result companies that use domestic labour force (for example) or domestic benefits by the laws of the WTO must not have any subsidies or benefits. Of course, it worsens the conditions for many local firms. One more serious flaw is the "infant industry argument". Countries do not have rights to protect industries, which only start to develop and need this protection for successful operation. They may be quickly

[13] *Zettel M.* "The GATS, Privatization and Water Services An Overview of Legal Services" .Maastricht Working Papers, the Faculty of Law, 2009

defeated by large foreign manufactures. In the short-run people lose their jobs (because of foreign and domestic competition) and the unemployment rate increases.

Now I would like to outline the main disadvantage that is examined in this work: the inequality of developing and developed countries that only increases because of the WTO. A lot of people criticize the World Trade Organization for some kind of discrimination for developing countries even though initially it was declared as the one of the goals of the organization. On November 14th 2001 the promising response to the anti-globalisation rights was adopted by the Ministreal Declaration. However, if we look at developing countries nowadays, we will see that most of them have not developed a lot and are dropped from decisions and disputes processes by powerful and rich countries.

2.3 Difference of the WTO Influence for Developed and Developing Countries

Several spheres that show the position of developing countries have been examined. First of, all tariffs and barriers are quite often one-sided, which means that developed countries use restrictions and developing ones have to decrease or eliminate them completely. For example, due to some questionable rules several poorest countries in Africa cancel all tariffs for 90% of the trade.

In addition, there are agricultural subsidies to "rich world farmers", which make their production and distribution process much easier while many local farmers of developing countries cannot enter or stay on the market because of this enormously high level of competition.

During the 9th Doha round there were negotiations regarding the access of poor countries that mainly locate in the South to the agricultural market of the Northern countries, which are considered rich. However, all discussions failed because the farmers of developed countries have strong political power and do not want the reduction of import tariffs to happen. The same happens with the cotton industry where more than 5 million small businesses of local farmers and their families left the market. The reason for this large shutting down was the payment of 47 billion of dollars as subsidies to developed countries producers. Undoubtedly, all these policies do not give ordinary poor farmers the chance to succeed and stay as producers. [14]

Developing countries allowed the introduction of many unequal measures that completely erased the correct notion of "reciprocity". For example, the bank system as both developed and developing countries have the right to open their banks (a restricted amount of branches

[14] guardian.co.uk

and banks) in other countries. However, it is clear that the number of transactions of some rich developed country bank is several times more than the amount of transactions of a group of banks of a developing country. Thus, not the right factor is being controlled as the number of transactions is far more important than the number of banks. The same shortcomings are connected with e-commerce and information technology goods as developing countries agreed with the terms of 1996 and 1998 negotiations and by this decision of eliminating any duties in this sphere deprived developing countries from a substantial part of revenues.

Moreover, TRIPS and numerous patents, trademarks and other regulations brought incredible damage to many countries (especially, developing ones). The pharmaceutical companies are protected from any decrease in profits and use of their medicine. However, a lot of common people in poor countries (Africa or Asia-Pacific where more LDC countries are situated) die each year because of the shortage of medicine. Although there was a significant change in 2001 when developing countries got the rights to produce or import generic drugs but the problem has not been completely overcome.

Besides, developing countries and especially least developed ones do not have the same voice in the whole decision making process as developed ones and their problems are quite often unheard. The cost of appearing on the stage of recommendations and findings is very high for many developing countries. Thus, they usually need a lot of time and effort to make claims or participate in negotiations (for example, protect themselves) and again developed countries are in a better position as for them this process is not so costly (in relative terms). Developing countries are always quite vulnerable because they cannot fully participate, struggle for their rights and observe other countries' obligations but if they do and try to increase their role, the expenses may be so high that risks connected of being victimized will stop the rational government.

Even in the beginning of the WTO when it provided developing countries with opportunities of market accession and "Most Favoured Nation" treatment many of them were unable to use this advantage as their supply capacity was on such low level. So their income and welfare stayed on the same level, which shows the uneven effects of the WTO on developed and developing countries. Those who were able to take the advantage of all measures soon faced the problem of increased protectionist tendencies in developed countries. These restrictions and quotas touched not only textiles industry (right after Multi-Fiber Arrangement was established and limited the number of exported textiles from developing countries). Quite similar limits were imposed on leather and jute products. All industries that were occupied by developing countries and that were hope to the economic improvement of developing countries step by step were seriously controlled and changed according to the

interest of rich and powerful countries. All the anti-dumping measures, all restrictions, tariffs and quotas only show that the system and trade is not so free and liberal as it seems from the first sight.

As developed countries affected the decisions and results in the past now they try to broaden the spheres of the WTO influence and some of them were initially quite unrelated to the GATT agreement and trade itself. The environment, investment and other innovations of the WTO may even worsen the conditions of developing countries.[15] It sounds particularly strange if we look at the number of developing countries (115) and the number of developed countries (43) together with Macao and Hong Kong though generally they are the part of China and the European Union is excluded as it is the entity, which presents developed countries that are already in the list). Actually there is some discrepancy in the data as, for example, the World Bank has one classification, the UN list has another division. My classification was based generally on the World Bank list.

Partly this situation was caused by the behavior of developing countries as they gave no response and not participated in some important disputes. There can be different reasons for such attitude:

- Some countries may think that subjects of these negotiations are in no way related to the their problems and development;
- There is some misunderstanding because of the huddle of claims and topics and countries prefer to stay aside rather than be involved without consciousness of the situation (and by this eliminate the damage of the reputation);
- Countries understand issues and their negative consequences but choose not to confront developed countries (because this opposition may bring even more problems in the future);
- There is a false impression that some other developing countries will negotiate and defend the interests of all/many developing countries and, thus, many of them decide to inflict subjects on more active members, which often prevents the right process of disputes in the WTO.

Many of these mistakes and shortcomings that may have been eliminated if developing countries were more integrated into the process, if they were able to cooperate and fight for their rights even though much effort and money should be spend. There also should be some kind of body, which will look after common interests and positions of developing countries. With its successful operation they will make claims and objections and while being supported with the most members (and as we know the number of developing countries in the WTO is

[15] *Michalopoulos C.* "Developing countries in the WTO, Palgrave", 2001

much greater than the number of developed ones) will achieve their aim and won't be discriminated in any sector.

3. Analysis of Research Papers and Existing Models

The great amount of literature is dedicated to the topic of the WTO influence. Different analyses were made. Some scientists considered the impact on a particular country, others subdivided countries into groups and investigated the effect of the organization. There is no agreement on the issue of the World Trade Organization effect. Some say that it is generally positive as the WTO promotes trade, others found some positive as well as negative moments and the disparity in developing and developed countries or even the failure of the organization and its inability to provide declared opportunities.

The difference of methodologies, models, dependent/independent variables, dummy variables and their number are all important factors in the evaluation process.

The most widely used econometric model is the gravity model.

The first scientist that used the gravity model in the analysis of international trade was Jan Tinbergen and in 1962 he explained bilateral trade flows using the "Newton's law of gravitation" and the formula:

$$\frac{T_{A,B} = (GDP_A)^{\alpha} \times (GDP_B)^{\beta}}{(Dist_{A,B})^{\varsigma}}$$

It shows that trade flows are directly related to GDP of each country (A and B) and inversely related to the distance between A and B. All powers are approximately equal to 1.

Though the author provided only intuitive explanation, his work considered significant part of international trade studies as the gravity model proved its stability for different countries and different times.[16]

As there are a lot of modifications different assumptions and propositions were made. Some used in derivation the Ricardian model, others the Hecksher-Ohlin. There were also different assumptions about prices, "multilateral resistance" concept, utility functions and demands.

In 2002 David D. Li and Changqi Wu made an event study in order to explore the actual topic of the WTO influence. They took 74 countries that were the members of GATT/ WTO in the time period from 1960 to 1998 and 38 that are not. Together with the main point of investigation the authors showed that the openness of a country alone could not guaranty the growth of a country and with this result opposed the view of Adam Smith.

The results are quite similar to the topic of my work as scientists proved by their analysis that high-income countries have large positive effects after the accession, while the growth of

[16] *Tinbergen, J.* "Shaping the World Economy. Suggestions for an International Economic Policy", 1962

the developing countries is not so significant. The growth appears in many spheres: export, import, FDI and etc. The division criterion was GDP per capita and if it was higher than 3,000 $ in 1987 than the country was moved to the developed group. One more division, which is less relevant to our discussion, is conducted by the law system (common law, European law and formerly socialist systems). European law countries benefited the most from the accession. The regression itself looks as: $Log(x_{it}) = \alpha_i + \sum_{j=1}^{J}(\beta_j T_t + \gamma_j Selection_{it} + \delta_j WTO_{it})jdummy_{it} + \varepsilon_{it}$

α_i is fixed effect coefficient for a economic variable x, j shows the type of economy (developed/developing, the type of the law system), γ_j the coefficient for capturing endogeneity, β_j shows the normal growth of a country, T is a time trend, Selection is the selection method and ε_{it} is the error term.

The growth of developed country was about 1.5% per year for the next 10 years after joining the WTO, the growth of developing countries was insignificant, the import and the export rose for developed countries at a rate 5% per year and again export increased by 1% and the import appeared not significant for developing countries. However, the stock of capital showed the inverse results: 4.5 % increase for low-income countries and 1% for high-income countries. Foreign direct investment increased significantly in both countries

The modern version of the gravity model was provided by Anderson and van Wincoop[17]. They were the ones who proved that "the empirical gravity equations do not have a theoretical foundation". In order to correct these limitations they added "multilateral resistance". Price indices are tightly connected with bilateral resistance as any restrictions immediately affect prices. Moreover, they solved the McCallum puzzle (which got that trade inside Canada was 22 (16) times more than the trade between Canada and the USA in 1988 (1993)). They key to the solution is the fact that the border factor is asymmetric and on "small" countries its influence is much higher together with the omission of some variables. The gravity model used by scientists is based on CES utility function and goods differentiated by place of origin.

The most significant work in this sphere belongs to Andrew Rose. His work "Do We Really Know that the WTO Increases Trade?"[18] in 2002 was studied and cited a great amount of times as many scientists adverted to it afterwards. He used more than 175 countries and fifty years together with the gravity model. His model included many dummy variables (distance, colony, FTA, GSP, language, WTO member and etc.) and the average value of exports and imports as the resulting value.

---

[17] *Anderson J.E.., van Wincoop E.* "Gravity with Gravitas: A Solution to the Border Puzzle" The American Economic Review, 2003, p.170-192

[18] *Rose Andrew K.* Do We Really Know that the WTO Increases Trade?, American Economic Review, 2004

The main result that the scientist got was that the WTO has no significant effect on trade of a country despite the common perception even though the model worked pretty well and showed significant positive results for "richer and more developed countries" and significant negative results for the distance, the fact that can be drawn out by the common sense. The author modified the types of analysis, added more dummy variables, divided countries into groups, identified and excluded regional trade agreements but no fundamental change occurred and the coefficients were still negative and insignificant. Nevertheless one quite important fact was revealed: GATT founding members (one from the pair/ both from the pair) increased trade significantly, which may be a good indicator of different conditions for countries that joined the WTO in different years and those who were among the organizers and first members. One more important result is the significant influence of the WTO on industrialized countries (t-statistics is 2.11, which is significant at 4% significance level) and the pair of industrialized countries-members of the WTO trades 60% more than the pair of non-members.

The Rose's paper touched off disputes and new researches. The main critics are connected with the dependent variable ln(trade) (as the average of exports and imports doesn't show the direction of trade, which is relevant in this case), the endogeneity of the WTO variable, the omission of "multilateral resistance" variable, the measurement errors and some mistakes in the data. Rose himself talked about the missing data (for example, missing trade data and missing "regressor" data). He also stated that the WTO effect is great (345%) if essential variables are dropped (GDP and distance) and treated his outcome as "an interesting mystery".

After this paper Rose wrote some other works connected with the WTO influence: "Which International Institutions Promote International Trade?"[19]. In this paper he investigated the relative power of the WTO and found it to be weaker than OECD and relatively the same as IMF; "Does the WTO Make Trade More Stable?"[20]: showed the non-volatility of trade of the countries that joined GATT/WTO. "The Effect of Membership in the GATT/WTO on Trade: Where Do We Stand?" (the latest work of Rose). It can be perceived as the correction and deeper investigation of some errors made in 2002. He emphasized questions of "inappropriate pooling of data", "inappropriate econometric techniques, especially fixed effects, "selection bias". All these things were criticized in his work in 2002. However, his view on the issue hasn't changed with the new paper as he still doesn't get results of significant influence.[21]

[19] *Rose A. K.* "Which International Institutions Promote International Trade?";Review of International Economics; 2005
[20] *Rose A. K.* "Does the WTO Make Trade More Stable?"; Open Economies Review; 2005
[21] *Rose A K.*, The Effect of Membership in GATT/WTO on Trade: Where Do We Stand?. Unpublished Draft

Arvind Subramanian and Shang-Jin Wei were one of the first who reacted to the Rose's work.[22] They got exactly the opposite results that the WTO positively influences countries and the additional volume of trade could reach the size of 120%. However, this effect varies for industrial (developed) and developing countries as well as for different industries as in some of them the tariffs were reduced and brought benefits and for others the restrictions and fight with them was unsuccessful (textiles, agriculture, clothing-all goods exported by developing countries). The activity rate of a member country, its ability to negotiate tariff cuts and "reciprocal liberalization" are also very import for its future. One more thing, which has been discussed in this work, were unequal conditions for initial and subsequent countries as the later ones joined the WTO after 1994 and were forced to liberalize their trade more seriously than initial participants of the WTO. I would like to concentrate on the asymmetry between developed and developing countries as it is tightly connected with the topic of this paper. It is said that developed countries through the negotiation process were able to reduce tariff barriers of developing countries by 10.5 % from 1947 to 1995. The key differences from the Rose's work is the use of the imports and it is more consistent with the theory and fixed effects while using Anderson and van Wincoop (2003) who proposed the fixed effect for a country that imports and the other one that exports. Subramanian and Wei took "multilateral resistance" on a new level by making the time-varying effects for a panel data. This innovation made it possible to eliminate GDP, GDP per capita and land area variables.

They affirmed that for developed country the trade increases by 68.2% or $(e^{0.52} - 1)$. The developing country has an average coefficient of 0.28, which means that on average the volume of trade is higher by 30%. However, this effect works on countries that joined the WTO in 1990s (during the Uruguay round) and became more open in 10 years.

Xuepeng Liu in 2007[23] also showed the importance of the WTO accession with the data from 1993 to 2003. He claimed that not only old trade partnerships were made stronger but also many new relationships appeared among countries. The first thing is called the intensive margin and the second has the name of extensive margin. His work is interesting because Liu decided to include all zero observations in the data (unlike Rose or Subramanian and Wei). The one-directional trade was calculated as N*(N-1) with N being the number of participating countries and two-directional as the fraction of N*(N-1)/2 with no missing import data included. His analysis showed 40% rise during 53 years in one-directional calculations and 46% growth for the same time period of a two-directional trade. His changed technique

[22] *Subramanian A., Wei S.-J.*, "The WTO Promotes Trade, Strongly But Unevenly". Journal of International Economics, 2007

[23] Liu X., "GATT/WTO Promotes Trade Strongly: Sample Selection and Model Specification". Review of International Economics, 2009

helped him to overcome some calculation errors in the Rose's work. It also brought the author to the use of Poisson model for the gravity model estimation that is more suitable with high frequency of zero observations.

The author mentions Silva and Tenreyro (2006)[24] who the first ones to prove this choice of model to be better for solving heteroskedastic and non-normal issues with maximum likelihood estimation. The panel data was constructed for 210 countries and the imports was also used as the dependent variable. The gravity model is quite standard with some modifications such as the inclusion of "alliance" and "hostility" used as additional variables. The "index of multilateral resistance" (Anderson and Wincoop (2003)) here has a proxy of:

$$Remote_{ijt} = \left(\frac{\sum_{m \neq i} Distance_{mi}\, GDP_{mt}}{\sum_{m \neq i} GDP_{mt}}\right)\left(\frac{\sum_{m \neq j} Distance_{mj}\, GDP_{mt}}{\sum_{m \neq j} GDP_{mt}}\right)$$

Where i and j are two countries and t is time.

In all three cases the Hausman test, which compares random and fixed effects, votes for the fixed effects.

The results are the following: 60% ($e^{0.47} - 1$) increase if both countries become members of the GATT/WTO and 23% ($e^{0.21} - 1$) if only one partner is in the organization with 30% being the extensive margin and 70% the intensive one.

Quite similar analysis was made by Gabriel Felbermayr and Wilhelm Kohler in 2006[25]. They investigated that with the Tobit and Logit estimations the WTO raised trade and particularly affected the extensive margin of trade (mainly due to decreased costs of international trade). Their key result is the corner solutions for the gravity model. The authors also examined the question of zero values. If both countries participate in the WTO, the coefficient before the variable S_{ijt} (which is 2 if there is export from at two countries from the pair) increases by 15% compared to the case when $S_{ijt} = 0$. The econometric analysis used bilateral exports in the role of dependent variable. While using the common regression of the log-gravity model no significant results were found. However, the Tobit model gave significant results of about 156% if both countries are in. The Logit results were smaller (only 10% growth).

Pao-Li Chang and Myoung-Jae Lee in 2011[26] used the new approach to the estimation process. They based on the nonparametric evaluation and permutation tests as the conventional gravity models had some misspecifications (omission of relevant relations). Then the Rosenbaum(2002) sensitivity analysis was applied. It investigates how unobservable

[24] *Silva J., Tenreyro S.* "The Log of Gravity". The Review of Economics and Statistics, 2006
[25] *Felbermayr G, Kohler W. K.* "Does WTO Membership Make a Difference at the Extensive Margin of World".CESifo working paper, № 1898, 2007
[26] *Chang P.-L., Lee M.Y..* The WTO Trade Effect, Journal of International Economic, 2011

variable/factor can influence the treatment. The authors used the Rose's date (although Subramanian and Wei found some mistakes in the information). The dependent variable is also the same ln(trade). Chang and Lee made use of the notion "dyad", which actually describes two partner countries. During the analysis they dropped some "poor" matched pairs. Once again their results showed that the WTO promotes trade strongly. For example, if both countries are the members of the GATT/WTO the trade volume rises to 224% from 53%. However, they agreed that there might be some errors with the effect of the WTO and its significance as different sectors are treated in the different way, some countries liberalize their trade without joining the WTO and some other reasons. For robustness checks the authors implemented restrictions on the same dyads, same year, different rounds of negotiations and developed versus developing countries. It helped to eliminate heterogeneity and showed difference between developing and developed countries as positive effects prevail in high-income and middle-income countries and low-income countries do not see any great changes. Chang and Lee outlined the high level of protectionism in developed countries that makes it hard for developing to export goods.

Quite different work was written by Ana Cecilia Fieler[27]. She used the limitations of the standard gravity model: its assumption that trade increases with total income even though in the reality it increases with income per capita and doesn't have significant changes because of the population. The Ricardian model was proposed in the paper. However, with only one type of good available it transforms to Eaton and Kortum and shows the gravity model. The author's work includes a lot of quantitative analysis. The countries are divided into poor and rich and two factors of production (labour, which moves freely between types of goods but not across countries, and technology that is completely mobile). Fieler got results that poor countries prefer to consume domestically as the domestic market provides the lowest cost while rich countries trade more and pay attention to barriers and wages. Moreover, from the data the significant result from the income per capita can be seen. After the quantitative comparison of "integrated model" and the gravity model the author stated that the first one is better as the gravity model (or Eaton- Kortum model) can explain the trade between OECD countries but doesn't work so well with the trade between countries of different income. The integrated model proposed by the author is able to work with all data.

[27] *Fieler A.C.* "Nonhomotheticity and bilateral trade: Evidence and a quantitative explanation". Econometrica, 2011

4. Research and Econometric Analysis

4.1 Empirical Study. Part I: Gravity Model

After the deep analysis of different research papers I decided to start my empirical work with the gravity model with the panel data.

My hypothesis is that the WTO has an uneven effect on developed and developing countries.

For the dependent variable I decided to use imports as according to the theory this indicator is more appropriate for the regression and generally organizations are more interested in import and its tariffs.

The data was gathered from different sources. The data on bilateral import was gathered from the UM Comtrade database, the whole information connected with the dummy variables was taken from the CEPII Gravity Dataset. The division of countries into developed and developing ones was made according to the World Bank database and its classification. The data of the WTO accession is taken from the official site of the organization.

The sample of all 214 countries is used. Values are in real terms. The analysis covers the data from 1960 to 2010. The number of observations equals to 76094. After the comparison of different studies made by scientists I chose the method used by Subramanian and Wei and also divided the periods of five years. My main goal was to develop the difference between developing and developed countries, which became the members of the WTO and the gravity model (that is used mostly by everyone and is subject to minor changes in different works) was my first step. Subramanian and Wei got significant results both for developing and developed countries at 5% significance level and as I've already said that for developing countries this result was negative and for developed ones positive. These results coincide with my hypothesis.

<u>The gravity model used in my analysis:</u>

$$ln(import_{ijt}) = \alpha + \beta 1\ Comlangij\ + \beta 2\ Borderij\ + \beta 3 \ln(dist_{ij}) + \beta_4\ Com.Currencyijt + \beta_5 Colony_{ij} + \beta_6 Cur.Colony_{ijt} + \beta_7 ComColony_{ij} + \beta_8 DevelopedGSP_{ijt} + \beta_9 FTA_{ijt} + \gamma 1\ Developed - WTOijt + \gamma 2\ Developing - WTOijt + \varepsilon_{ijt}$$

– $import_{ijt}$- is the volume of import from one country to another at time t;

– $Comlang_{ij}$ -the dummy variable that has the value of 1 if countries(i, j) have the same language, otherwise 0;

– $Borderij$- the dummy variable, which has the value of 1 when countries(i, j) have a common border, otherwise 0;

– $ldistance$ – is the natural logarithm of the distance between two countries(i, j);

– $Com.Currrencyijt$- the dummy variable that shows whether the countries(i, j) are the members of the Currency Union (with the value of 1);

– $Colony_{ij}$ - the dummy variable that has the value of 1 for countries (i, j) that have ever been in colonial relationships;

– $Cur.Colony_{ijt}$ - the dummy variable that has the value of 1 if countries(i, j) are now in colonial relationships;

– $ComColony_{ij}$ - the dummy variable that has the value of 1 if countries(i, j) have common colonizer after 1945;

– $DevelopedGSP_{ijt}$- the dummy variable that shows has the value of 1 if the developed country grants GSP preferences;[28]

– FTA_{ijt} - the dummy variable that shows whether the country is in Free Trade Agr.

– $Developed-WTOijt$- the dummy variable that shows the developed importer of the WTO;

– $Developing-WTOijt$ -the dummy variable that shows the developing importer of the WTO.

In order to eliminate heteroskedasticity I use robust standard errors. Table 1.1 shows all results. The regression has 11 independent variables and 3 of them are insignificant. They are: common language (t=-1.87), current colonial relationships (t=1.51) and common currency (t=-1.35). Even though language and currency appear to be insignificant in the theory I expected positive coefficients. Log of distance also has a negative significant influence, which is quite natural as when the distance between two countries increases, it becomes more difficult to trade (higher shipment costs, longer time and etc.) Border, colony, ever in colonial relationship, FTA and developed country in GSP have positive significant coefficients (which is expected).

[28] It means that developing countries have preferential tariff rates (reduced or completely eliminated) on the markets of developed countries.

While talking about developed and developing countries my hypothesis is supported by the model: a WTO developed importer has a significant (at all significance levels) positive coefficient (t=37.51). A WTO developing importer has a significant (also at all significance levels) negative coefficient (t=-39.85). It means that after the developed country joins the WTO its trade increases by $e^{1.243} - 1$ or by 246% and the developing country has a sharp reduction of 65.2%.

As there are actually a lot of regressors the multicollinearity may arise. In order to control this problem I used the VIF (Variance Inflation Factor) test. The VIF test is computed as $VIF_j = \frac{1}{1-R_j^2}$. The critical value of VIF is usually 5 or 10. All VIFs in this regression are a little more than 1. Thus, there is no pattern of multicollinearity. (The VIF results are shown on Table 1.2)

In order to double check the collinearity problem I made correlation matrices separately for language, distance and border as one group and common colonizer after 1945, current colonial relationship as another group. All results were normal and, thus, there is no sign of correlation. (See Tables 1.3(a) and Table 1.3(b)). As wee can observe from Table 1.3 (a) the correlation between log(distance) and border is negative (-0.4211) as well as between log(distance) and common language (-0.1335). These values are expected as if the distance between countries increases the possibility that they have common border reduces and almost disappears after some time. The same happens with languages. Usually neighbouring countries have common language. For example, Belgium, France and Switzerland both speak French and Oman, Qatar, Saudi Arabia all speak Arabic. However, as many developing and LDC countries were/are colonies of rich countries some languages may be met far away from their motherlands. French is the official language in Chad, Djibouti, Equatorial Guinea; English is spoken in Belize, Guyana, Cameroon.

Table 1.3 (b) also shows the negative correlation between variables of current colonial relationship, common colonizer and ever in colonial relationship. The correlation between common colonizer and current colonial relationship is very low and can be approximated -0.01. Thus, there is almost no correlation. The same insignificant value of correlation is between common colonizer and ever in colonial relationship (-0.0482). The current colonial relationship and ever in a colonial relationship has a higher positive correlation about 0.3. It is easily explained by the fact that some current countries (colonies and colonizers) are included in the ever colonial relationships. However, the relationship is not strong and should not be a problem

I've also decided to test the joint significance of cultural variables (common language, current colonial relationship, common colonizer and ever in colonial relationship) is shown with Table 1.4 (the chi-squared is value is used). As the P-value is about 0 then Ho of no significance is rejected and we can conclude that cultural specificities generally promote trade (imports).

Afterwards the problem of endogeneity was considered. As fixed effects together with instrumental variables are methods to solve this problem for the comparison of fixed and random effects I used the Hausman test. My P-value is almost zero, thus, the right choice is to use the model with the fixed effects. Logically it is also more correct as the model with fixed effects helps to control for various shocks (that can happen quite frequently in international economics and trade) and also to eliminate the decrease in estimated parameters because of independence rules of the error term. However, the fixed regression in this case drops all constant in time dummy variables (distance, language, border, common colonizer and ever colonial relationship). Precisely speaking, these variables can be called control variables. Table 1.5 shows all results for 3 regressions. With fixed effects some coefficients change their signs but the most important fact for us are developed and developing countries. Both in fixed and random effects a developed country has a small (insignificant) reduction of the WTO effect. However, developing country has a positive effect from the WTO accession (even though it is smaller than of a rich country). With fixed effects it is 33.6% and with random 6%. Nevertheless, I decided to use Hausman-Taylor regression, which gives the opportunity to estimate constant variables and endogenous variables. The constant was suppressed, the fixed through time dummies were language, common colonizer, colony, distance and border[29]. I suspected that FTA can endogenous and actually many researches were made on this topic[30]. (Table 1.8 shows all data)

The results I got are different from the standard log-linear regression in common language, common currency and developed/developing countries. Common language and currency now have positive coefficients, which coincides with the theory as these two indicators should promote trade. The common currency is significant at any level while common language is significant at 5% and insignificant at 1%. Developed countries increase their imports by approximately 218%, developing countries has growth of 16%.

Summing up, the analysis of the gravity model has shown that the effect of the WTO on the developed and developing countries is indeed uneven. With the standard log-linear model

[29] Developed/developing dummies were also tested as endogenous and the results almost don't differ from the case when only FTA is endogenous.
[30] *Baier S. L, Bergstand J. H.* "Endogenous Free Trade Agreements and the Gravity Equation". Journal of International Economics, 2003

developing countries even lose when the join the organization (about 65% decrease in imports). However, the endogeneity problem actually misrepresented some coefficients and, thus, by controlling endogenous and fixed through time dummy variables the true coefficients were estimated. The difference for developed and developing countries is very big (202%) and it proves my hypothesis.

The next step of my empirical work was the estimation of regressions that showed the general level of imports and exports of a country (and not bilateral trade). I tried to move away from the standard gravity estimation and use new methods.

4.2 Empirical Study. Part II

After the analysis of many research papers and the first part of the empirical study significant results were obtained. In order to have more detailed, extensive and deep analysis of the topic under consideration I decided to switch my work to another model that can be more innovative and show some new results. After the goal was set I considered a great amount of variants. The specific nature of the topic under discussion (the uneven influence of the WTO on developed and developing countries) assumed the use of the panel data, precisely speaking the balanced data because not so many countries joined the organization in the last few years. A panel is said to be balanced if the number of time periods t=1,…,T is the same for each cross section observation. It has many advantages and usually is a good tool to eliminate heterogeneity and the noise made by it. All models are estimated with the cross-section weights, which is a good way to eliminate the problem of heteroskedasticity. Regarding the problem of the endogeneity, the use of the model with weighted weights on the spatial data provides the exogeneity of variables.

The following indicators of export and import were used as the resulting variables:

1. Export volume index[31]
2. Import volume index
3. The growth of exports
4. The growth of imports
5. The value of exports (computed in US dollars; prices of the year 2000)
6. The value of imports (computed in US dollars; prices of the year 2000)

[31] The index is computed as the percent that is the change (stimulated by the export change with fixed price) of the last year

In this part of the analysis I included both exports and imports as the dependent variable in order to see separate effects. Moreover, although in many works imports is used and it is said that countries are more concerned with its tariffs and other restrictions other scientists use exports as it doesn't include cost insurance freight (as imports) and includes tax on exports and exports subsidy because it is measured by the free in board method. Some of the resulting variables were also used as the explanatory variables. For example, the export volume index is affected by the import volume index. The relationship between exports and imports is controversial as Husted in 2002 examined the quarterly trade data of the U.S. and found significant slope coefficient. This result coincides with the theory as export and import should converge. However, the research of Fountas and Wu in 2009 showed no significant correlation in the long-run. [32] Thus, I try to shed the light on this relationship.

Besides, many other variables were used:

1. GDP per capita (computed in US dollars; prices of the year 2000)
2. The urban population share in the whole population
3. The growth rate of the urban population
4. The dummy variable that shows whether the country is developed or not
5. The dummy variable that shows whether the country is the member of the WTO
6. The variable that shows for how many years the country is the part of the WTO

At a later stage the total population, migration and the GDP of the neigbouring countries were also included. (Not all of them will be shown in the analysis due to the poor quality of models.)

The data on imports and exports is taken from the IMF World Economic Outlook Database April 2013, the GDP was obtained from the World Bank database as well as IMF. Migration, urban population were also taken from the World Bank, the information of the country accession was taken from the official site of the WTO. [33]

As it was already said the classification of countries was made according to the World Bank division. It has 4 groups: low income groups whose GNI per capita is $1,025 or less than this value, lower middle income ($1,026 - $4,035), upper middle ($4,036 - $12,475) and high income, which is equal or bigger than $12,476. The indicator was calculated in 2011.

[32] *Mukhtar T., Rasheed S.* "Testing Long Run Relationship Between Exports and Imports: Evidence from Pakistan". Journal of Economic Cooperation and Development, 2010, p. 41-58
[33] wto.org

The developed countries are countries with the high income, other are considered developing.[34]

The data was gathered for the time period between 1960 and 2012 for all 214 countries (these are countries that have the population of more than 30,000) that exist nowadays. Not all data was included in the model as some of it didn't fit the balanced model. However, the included data is enough to give consistent results.

In the beginning many models were developed for the 6 dependent variables already mentioned above. For each of the variable the best model was chosen according to the significance of its explaining variables. The decision of the combination of used independent variables was made with the elimination method (one or more variables was excluded and the new regression was estimated).

All models have the following specification:

$$Y_{it} = \bar{\beta}_{it}\bar{X}_{it} + \bar{\gamma}_{it}\overline{D}_{it} + \varepsilon_{it}$$

where Y_{it} is the dependent variable, $\bar{X}_{it}$ is the vector of independent variables, $\overline{D}_{it}$ is the vector of the dummy vatiables and ε_{it} is the normally distributed error term.

I

$$ExInd_{it} = \gamma 1_{it} Dev_{it} + \gamma 2_{it} Member_{it} + \beta 1_{it} UrbGrowth_{it} + \beta 2_{it} Years_{it} + \beta 3_{it} ImInd_{it} + \varepsilon_{it}$$

The first model uses the export volume index as the dependent variable and there are 5 independent variables: dummy that shows that the country is developed, the WTO member dummy, years of the WTO membership, urban population growth and import volume index. All coefficients can be seen in the regression analysis from Table 2.1. The export volume index (the change in exports volume because of the sales with fixed prices) is positively and significantly affected by the import volume index and the years of the WTO membership: t-statistics is 15.32 and 11.55. Urban population growth has a negative effect on the dependent variable. It can also be said that the share of urban population is stable for several decades and deviates quite a little in developed countries and developing countries have high increase in the urban population that doesn't stop and so their exports may also decrease because of it. The WTO membership generally decreases the level of export volume index (the t-statistics is -3.2). The dummy that shows the effect of the developed country shows that the export volume index increases and it is significant at 5% but won't be significant at 1% level. Thus,

[34] http://data.worldbank.org/

if we use 1% significance level we should say that there is no significant difference between developed and developing countries. However, at 5% developed countries have good benefits. The main result is that when the developed country joins the WTO it loses only 2.411 (which is really small compared to the 4,863.953) and if the developing country joins the WTO the decrease will be noticeable as relative to it before the WTO accession it is a significant reduction. However, after some time there can be some gain for the developing country as the WTO years variable is significant and positive. R^2 is 0.625, which is generally a good sign.

II

$$ImInd_{it} = \gamma 1_{it} Dev_{it} + \gamma 2_{it} Member_{it} + \beta 1_{it} UrbGrowth_{it} + \beta 2_{it} Years_{it} + \beta 3_{it} ExInd_{it} + \varepsilon_{it}$$

The second model switches places of exports and imports and now the imports variable is dependent and the exports variable is independent. The Table 2.2 has all results. As we can see all coefficients are significant at all significance level. Here the developed country dummy has a negative significant influence on imports (t-statistics=-14.537) as well as urban population growth (t=11.67). Nevertheless, developed countries then improve their position as the years of the WTO membership has a significant positive influence, too (however, quite a long period of time will be required). The developing countries increase their level of imports volume index after the accession and during the years it only rises. R^2=0.752, which is high.

The results that are obtained from the first two regressions are quite connected with the analysis made in the theoretical part. As generally developed countries quite often make it hard for developing countries to enter rich countries' markets and their level of exports are often less than of the developed countries and the level of imports can be higher. Though, if we compare these results with the gravity analysis, we will find that they are opposite and imports of developed countries is generally significantly higher than of developing countries.

Although from the international economics theory we should remember that if the country's imports increases and its exports decreases (or even stays the same) then the current account decreases, which means that the aggregate output falls. There may be an expectation of the growth in short-term but in the long-run it can bring a lot of problems as it can increase the country's credit risk and eventually the economic situation in the country may sharply decrease (foreign investors will reduce the demand on the country's assets as investment may be not profitable) and country's currency will depreciate. Thus, these 2 models show that developed countries are in a much better situation after the WTO accession then developing countries.

III and IV

$$ExG_{it} = \gamma 1_{it} Dev_{it} + \gamma 2_{it} Member_{it} + \beta 1_{it} UrbGrowth_{it} + \beta 2_{it} Years_{it} + \beta 3_{it} ImInd_{it} + \varepsilon_{it}$$

I combined these models because both of them appeared to be worse than Model 1 and Model 2.

The third model (that explains the growth of exports) has three insignificant variables at 5% sign. level (developed dummy, the WTO membership dummy and the years of the membership) and all of the variables are insignificant at 1% level. R^2 is 0.038 , which is very low. Except the years of the WTO all other coefficients have the same sign of the regression as the exports volume index and they are insignificant anyway. The Jarque-Bera test shows that the error term is not normally distributed. Thus, this model shouldn't be used.

$$ImG_{it} = \gamma 1_{it} Dev_{it} + \gamma 2_{it} Member_{it} + \beta 1_{it} UrbGrowth_{it} + \beta 2_{it} Years_{it} + \beta 3_{it} ExInd_{it} + \varepsilon_{it}$$

The fourth model, which shows the growth of imports, is a lot better, however, the significance of all coefficients is lower than in the model with the imports volume index. The years of the WTO is the only insignificant variable and all coefficients except it coincide the ones in the first model. The coefficient of the developed country is again negative and significant, which means that if the developed country enters the WTO its import will be much less than the imports of the developing country and the years spend in the WTO don't mean change anything. R^2 is again quite low (only 0.538).

The problem with these two models (especially the Model 3) can be in the fact of some volatilities in inflation, exchange rates and other not controlled by us factors and it can also describe the low value of R^2.

The log(exports) and log(imports) appeared to be the best specifications and among many models I chose 4 (2 for exports and 2 for imports in order to briefly outline their results).

V and VI

In order to examine different approaches I eliminated the developed dummy and tried to use GDP per capita. It is not a perfect substitute since the division was made according GNI per capita, which is based on ownership and GDP is calculated basing on ownership. However, in V and VII models I assumed that these two indicators are the same.

$$log(Ex_{it}) = \gamma 1_{it} Member_{it} + \beta 1_{it} UrbPOP_{it} + \beta 2_{it} Years_{it} + \beta 3_{it} \log (GDP_per_capita)_{it} + \varepsilon_{it}$$

The specification differs from others and its R^2 is about 0.96, which is extremely high (and it is suspicious) and the error-term is not normal at all. Its coefficient of the WTO membership is positive and significant (t=336.79), urban population growth has a negative influence on exports. The years of the WTO membership coefficient is also positive and significant and the logarithm of GDP per capita is also very significant and its t-statistics is equal to 124. The coefficient is 0.997, which means that with the increase of 1% of this independent variable the exports increases by 0.99%.

$$log(Im_{it}) = \gamma 1_{it} Member_{it} + \beta 1_{it} UrbPOP_{it} + \beta 2_{it} Years_{it} + \beta 3_{it} \log (GDP_per_capita)_{it} + \varepsilon_{it}$$

The regression has the same results as the exports one and all coefficients are approximately the same (signs are also the same). The coefficient before GDP per capita is 0.9, which means that with 1% increase in it the imports increases by 0.9%. (t=120.62). Here developed countries have benefits.

While comparing the models with and without developed dummy I chose the one with it as it has normal R^2 (not too high) and normal distribution of the error term. This factor is very important as no substantial conclusions can be done if the error term has skewness and kurtosis.

VII

$$log(Ex_{it}) = \gamma 1_{it} Dev_{it} + \gamma 2_{it} Member_{it} + \beta 1_{it} UrbPOP_{it} + \beta 2_{it} \log (GDP_Neigh)_{it} + \varepsilon_{it}$$

This specification includes the new variable that shows GDP of neigbouring countries. The data was gathered separately for each country and 4 neigbouring countries were used. In general most of these neighbours have common borders with a country of interest. However, in some cases other independent states were chosen according to the distance (in km) if there weren't enough "border neighbours". There should be a positive effect from this indicator as richer and more developed neighbouring countries increase the potential trade opportunities as generally trade for smaller distances is bigger (these countries as well may have common language and other similarities).

All coefficients except the WTO membership are positive and all of them are significant. GDP of neigbours has the value of 0.536 and t-stat=22.62. The one 1% increase in the total GDP of neghbouring countries will give 0.53% rise in exports. These numbers are consistent with other assumptions of positive influence. Once again for a developed country the process of joining the WTO won't be noticeable as its coefficient is only -0.2584. However, for the developing country it may significantly deteriorate exports as relative to its all other values it is a big change and its exports will fall by 25%. R^2 is 0.759, which is a good sign. All results can be seen in Table 2.7.

VIII

$$log(Im_{it}) = \gamma 1_{it} Dev_{it} + \gamma 2_{it} Member_{it} + \beta 1_{it} UrbPOP_{it} + \beta 2_{it} \log (GDP_Neighb)_{it} + \varepsilon_{it}$$

The imports model also has all significant coefficients and all positive except the WTO membership (t=-14.73). The dummy for a developed is also significant and its t-stat is equal to 15.29. GDP of neigbouring countries is positive and significant (0.525) and t=22.44. Again 1% rise in total GDP of neigbours increases imports by 0.52%.

It is important that here the developed dummy has a positive coefficient (it is implausibly big and it is not so in the reality). However, these results are the same as in the gravity model regression and developed countries benefit more.

I've also tried to include the migration, the average time of export and import shipments but the data is available for some years only and, thus, the small number of observations can be used (about 200). All variables (or most of them) were insignificant.

All specifications of models have enormously big coefficients of the developed dummy. It could happen because of the different measurement units or because of the specification of the used models. During the analysis the value of the coefficient wasn't so much taken into account as generally it was important to show the effects of the WTO on developed and developing countries and their difference, which was presented by these models.

Conclusion

The main goal of this paper was to show uneven effects of the WTO on developed and developing countries. In this research the history of the WTO together with its main rules (non-discrimination, the reduction of all tariffs and restrictions, stable trade conditions, competition maintenance and development and privileges for less developed countries) and functions (control of trade agreements, settlement of disputes, assistance for less developed countries, cooperation with other international organizations and provision of conditions for trade) were outlined and discussed. The WTO accession process and membership were also examined with its advantages and disadvantages. The important section of the main spheres and changes that occur under the pressure of the organization were discussed.

As it was said not only developed countries are guilty of the unequal conditions of developing countries in the World Trade Organization but to some extent developing countries by themselves were not so initiative and didn't assert their rights. As a consequence the minimization of tariffs and import customs duties led to lost opportunities. Quite often rich countries kept and still keep some restrictions regarding the poor[35] countries and, thus, the later ones cannot export their goods and services in the amount that the true "free" trade should give. These restrictions are particularly connected with textiles, farmers. Another important problem are TRIPS as patents on medicine, for example, kill millions of people, especially in least developed countries. We can observe that "Most Favoured Nation" treatment is not followed in the reality. However, developing countries have the reason for this "inactive" behavior as sometimes costs of these negotiation processes are so high that it is not rational for them to get into this business.

Research papers examined in this work also showed different effects on developed and developing countries whether imports or exports were taken as dependent variables. On average if the developed country joins the WTO its imports rises by 200%. The situation with exports is approximately the same. The specificity of these results is that most of them were obtained from the bilateral trade analysis and the use of the gravity model.

The empirical analysis of the bilateral trade conducted in this paper also shows that the effects on developed and developing countries are not the same. By this my hypothesis was confirmed. The gravity model and its regression showed that the imports of the developed countries significantly increases compared to changes in the developing countries.

The second part of the analysis included the simple regressions of the balanced panel data with cross-section weights and exports/imports as the resulting variables. The originality of

[35] Here "poor countries" means developing countries.

this method consists of the fact that it shows the trade with the whole world (differs from the gravity analysis of the bilateral trade) and uses some new variables such as urban population share, GDP of neighbouring countries and etc. With its help the asymmetry of the effects was also displayed. However, here the exports generally increased significantly for a developed country and decreased for a developing one and the imports showed the opposite situation. Thus, developing countries benefited as importers but lost a lot as exporters. The results can be influenced by the specificity of the model. Anyway the goal to show the uneven effect of the World Trade Organization was successfully achieved.

The quantitative examination in the sum brings to a conclusion that developing countries should fight for their rights, try to strike equal conditions and be more active participants. If developed countries reduce or completely eliminate their tariffs then developing ones will be able to increase their exports, which should be under their special control. The key point is that if a country joins the WTO it doesn't mean that immediately everything will worsen or become better. The important factor is the economic policy of a country as the WTO is only a "tool" in its hands.

References

1. Горбунова О.А., Миченнкова И.В. “ВТО. Основы функционирования и проблемы присоединения России”. Дашков и Ко, 2009, с.152

2. Дюмулен И.И. “Всемирная торговая организация” . М.: Экономика, 2009. С. 58

3. Кузнецова, И. П. “Всемирная торговая организация: функции, проблемы, перспективы”. ЭКО, 2006

4. Шувалова М.А. “Проблемы и перспективы России при вступлении в ВТО” Экономика России: XXI век., 2010. – № 5(296). С. 16-23.

5. Царева А.Б. “Интеграция российской экономики в ВТО” Внешнеторговое право,2009. – №5. С. 4-10.

6. Anderson J.E.., van Wincoop E. “Gravity with Gravitas: A Solution to the Border Puzzle” The American Economic Review, 2003

7. Anderson J.E.., van Wincoop E. “Trade Cost”. NBER Working Paper, 2004

8. Baier S. L, Bergstand J. H. “Endogenous Free Trade Agreements and the Gravity Equation”. Journal of International Economics, 2003

9. Chang H.-J., “Kicking Away the Ladder – Development Strategy in Historical Perspective”. Anthem Press, 2002

10. Chang P.-L., Lee M.Y.. The WTO Trade Effect, Journal of International Economic, 2011

11. Deraniyagala, S., and B. Fine.“New Trade Theory versus Old Trade Policy: A Continuing Enigma.” Cambridge Journal of Economics 25(6), 2003

12. Deardoff A. “Determinants of Bilateral Trade: Does Gravity Work in Neoclassical World?”. NBER, 1995

13. Felbermayr G, Kohler W. K. “Exploring the Intensive and Extensive Margins of World Trade”.Review of World Economic, 2006

14. Felbermayr G, Kohler W. K. “Does WTO Membership Make a Difference at the Extensive Margin of World”. CESifo working paper, № 1898, 2007

15. Fieler A.C. “Nonhomotheticity and bilateral trade: Evidence and a Quantitative Explanation”. Econometrica, 2011

16. Helpman E.,Rubinstein Y. “Trading Partners and Trading Volumes. Draft

17. Irwin, Douglas A. “ Against the Tide: An Intellectual History of Free Trade”. Princeton University Press, 1996.

18. Liu X., “GATT/WTO Promotes Trade Strongly: Sample Selection and Model Specification”. Review of International Economics, 2009

19. Mayer T., Zignago S. "Notes on CEPII's Distance Measures, 2006

20. Michalopoulos C. "Developing countries in the WTO". Palgrave, 2001

21. Mikic M., "Commonly Used Trade Indicators: A Note". ARTNeT Capacity Building Workshop on Trade, 2005

22. Mukhtar T., Rasheed S. "Testing Long Run Relationship Between Exports and Imports: Evidence from Pakistan". Journal of Economic Cooperation and Development, 2010, p. 41-58

23. Rose Andrew K. "Do We Really Know that the WTO Increases Trade?". American Economic Review, 2004

24. Rose A. K. "Which International Institutions Promote International Trade?". Review of International Economics,2005

25. Rose A. K. "Does the WTO Make Trade More Stable?". Open Economies Review, 2005

26. Rose A K., The Effect of Membership in GATT/WTO on Trade: Where Do We Stand?. Unpublished Draft

27. Rukavishnikova E., ICEF Course Work: "International Trade, the WTO and the Impact on Russia", 2012,p. 25-29

28. Silva J., Tenreyro S. "The Log of Gravity". The Review of Economics and Statistics, 2006

29. Subramanian A., Wei S.-J., "The WTO Promotes Trade, Strongly But Unevenly". Journal of International Economics, 2007

30. Tinbergen, J. Shaping the World Economy. Suggestions for an International Economic Policy, 1962

31. Volkov, Solodkov. "International trade". Higher education, 2008

32. Woolridge J. "Econometric Analysis of Cross Section and Panel Data. The MIT Press, 2002

33. Zettel M. "The GATS, Privatization and Water Services An Overview of Legal Services". Maastricht Working Papers, the Faculty of Law, 2009

34. The International Statistical Institute (isi.web.org)

35. Faculty.hass.berkely.edu/arose/

36. guardian.co.uk

37. un.org

38. wto.org

39. wikipedia.org

40. un.org

Databases:

1. CEPII
2. International Monetary Fund
3. UN Comtrade
4. World Bank

Results

Gravity model

Table 1.1 The log-linear gravity model with robust standard errors

limport	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
ldistance	-.4713831	.0154455	-30.52	0.000	-.5016561	-.44111
border	1.108496	.0636881	17.41	0.000	.9836673	1.233324
comcol	-1.351204	.0453767	-29.78	0.000	-1.440142	-1.262266
curcolony	.2637784	.1742278	1.51	0.130	-.0777073	.605264
comlang	-.054159	.0290109	-1.87	0.062	-.1110202	.0027022
colony	2.54271	.0570543	44.57	0.000	2.430884	2.654537
comcurrency	-.1295805	.0959443	-1.35	0.177	-.3176309	.0584698
developed_~O	1.243817	.0331558	37.51	0.000	1.178832	1.308803
developing~O	-1.057688	.026544	-39.85	0.000	-1.109714	-1.005662
fta	2.098706	.08341	25.16	0.000	1.935223	2.262189
Deved_GSP	.893698	.0351306	25.44	0.000	.8248422	.9625538
_cons	14.32131	.1288679	111.13	0.000	14.06873	14.5739

Table 1.2 Test for multicollinearity

Variable	VIF	1/VIF
ldistance	1.38	0.725827
developing~O	1.34	0.747922
comcol	1.30	0.767057
border	1.25	0.800027
comlang	1.24	0.807123
developed_~O	1.23	0.810666
Deved_GSP	1.20	0.834701
colony	1.16	0.860006
comcurrency	1.16	0.864455
fta	1.13	0.884033
curcolony	1.12	0.894672
Mean VIF	1.23	

Table 1.3 (a) Correlation matrix for log(distance), border and common language

	ldista~e	border	comlang
ldistance	1.0000		
border	-0.4211	1.0000	
comlang	-0.1335	0.1195	1.0000

Table 1.3(b) Correlation matrix of common colonizer after 1945, current colonial relationship and ever in colonial relationship

	curcol~y	comcol	colony
curcolony	1.0000		
comcol	-0.0143	1.0000	
colony	0.2973	-0.0482	1.0000

Table 1.4 Joint test for cultural significance

```
( 1)  - curcolony + comlang = 0
( 2)  comlang - colony = 0
( 3)  - comcol + comlang = 0
( 4)  comlang = 0

      F(  4, 76082) =  908.61
           Prob > F =    0.0000
```

Table 1.5 Results of the gravity regression

(1) Initial regression, without effects
(2) Regression with fixed effects
(3) Regression with random effects

	(1) limport	(2) limport	(3) limport
ldistance	-0.471***		-0.645***
	(-30.52)		(-20.23)
comlang	-0.0542		-0.0812
	(-1.87)		(-1.26)
border	1.108***		1.404***
	(17.41)		(8.84)
comcol	-1.351***		-1.698***
	(-29.78)		(-19.94)
curcolony	0.264	0.0868	0.153
	(1.51)	(0.56)	(1.00)
colony	2.543***		3.398***
	(44.57)		(17.90)
comcurrency	-0.130	0.451***	0.304***
	(-1.35)	(4.67)	(3.38)
developed_~O	1.244***	0.914***	1.142***
	(37.51)	(18.37)	(29.42)
developing~O	-1.058***	0.298***	0.0649**
	(-39.85)	(13.04)	(3.05)
fta	2.099***	2.184***	2.298***
	(25.16)	(36.57)	(41.59)
Deved_GSP	0.894***	1.572***	1.761***
	(25.44)	(30.10)	(42.57)
o.ldistance		0	
		(.)	
o.comlang		0	
		(.)	
o.border		0	
		(.)	
o.comcol		0	
		(.)	
o.colony		0	
		(.)	
_cons	14.32***	9.961***	14.27***
	(111.13)	(560.06)	(53.81)
N	76094	76094	76094

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

36

[36] * the coefficient is significant at 5% level
** coefficient is significant at 1% level
*** coefficient is significant 0.1% level

Table 1.6 Hausman test

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
curcolony	.0867768	.1532414	-.0664646	.0227608
comcurrency	.451338	.30432	.147018	.0355829
developed_~O	.9138043	1.141972	-.2281681	.031103
developing~O	.2984583	.0649143	.233544	.0083737
fta	2.183619	2.297876	-.1142566	.0226316
Deved_GSP	1.571932	1.760747	-.1888142	.0318933

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 883.64
Prob>chi2 = 0.0000

Table 1.7 Variables and their mean, variance, min, max

stats	limport	ldista~e	comlang	border	comcol	curcol~y	colony	comcur~y	de~d_WTO
mean	10.46702	8.177309	.2214829	.0300857	.0986763	.0018754	.0208086	.014165	.1418662
variance	10.58845	.6421866	.17243	.0291808	.0889402	.0018719	.0203758	.0139645	.1217414
min	-5.283875	3.782556	0	0	0	0	0	0	0
max	21.00921	9.421514	1	1	1	1	1	1	1

stats	de~g_WTO	fta	Deved_~P
mean	.3692516	.0191195	.1068614
variance	.2329072	.0187541	.095443
min	0	0	0
max	1	1	1

Table 1.8 Hausman-Taylor Estimation

```
Hausman-Taylor estimation                       Number of obs      =     76094
Group variable: cpdum                           Number of groups   =     16941

                                                Obs per group: min =         1
                                                               avg =       4.5
                                                               max =        11

Random effects u_i ~ i.i.d.                     Wald chi2(11)      =         .
                                                Prob > chi2        =         .
```

limport	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
TVexogenous						
curcolony	.0473229	.148133	0.32	0.749	-.2430124	.3376582
comcurrency	.511645	.089821	5.70	0.000	.3355991	.6876908
developed_~O	1.160852	.0416104	27.90	0.000	1.079297	1.242406
developing~O	.1570499	.0212819	7.38	0.000	.1153381	.1987617
Deved_GSP	1.773603	.0439667	40.34	0.000	1.68743	1.859776
TVendogenous						
fta	2.342187	.0562649	41.63	0.000	2.23191	2.452465
TIexogenous						
ldistance	1.118124	.0045547	245.49	0.000	1.109197	1.127051
comlang	.2220227	.0862439	2.57	0.010	.0529877	.3910578
border	4.49327	.1943992	23.11	0.000	4.112254	4.874285
comcol	-1.117194	.1123814	-9.94	0.000	-1.337458	-.8969308
colony	3.12487	.2493816	12.53	0.000	2.636091	3.613649
sigma_u	3.8087056					
sigma_e	1.429064					
rho	.87659132	(fraction of variance due to u_i)				

Note: TV refers to time varying; TI refers to time invariant.

Cross-section weights model

Table 2.1 The 1st model estimation

Model: Panel EGLS (Cross-section weights) *Dependent Variable*: **Export volume index** (EXP_VOLUME_IND)				
Independent variable	*Name*	*Coefficient*	*St.Error*	*t-stat*
Developed country	DUMMY_DEVELOPED	4863.953**	1470.875	3.306843
The WTO member	DUMMY_WTO	-2.411***	0.737564	-3.268720
Urban population growth	URB_POPUL_GROWTH	-4.894***	0.644988	-7.587744
Years of the WTO membership	YEARS_WTO	2.307***	0.199750	11.55068
Imports volume index	IMP_VOLUME_IND	0.405***	0.026414	15.32320
$R^2 = 0{,}625; prob(JB = 0{,}54) = 0{,}76,$ *** significant coef,				

Table 2.2 The 2nd model estimation

Model: Panel EGLS (Cross-section weights) *Dependent variable* **Import Volume Index** (IMP_VOLUME_IND)				
Independent variable	*Name*	*Coefficient*	*St.Error*	*t-stat*
Developed country	DUMMY_DEVELOPED	-21717.27***	1493.925	-14.53705
The WTO member	DUMMY_WTO	10.896***	0.748791	14.55138
Urban population growth	URB_POPUL_GROWTH	10.415***	0.892153	11.67387
Years of the WTO membership	YEARS_WTO	2.236***	0.200742	11.13913
Export volume index	EXP_VOLUME_IND	0.550***	0.024011	22.90870
$R^2 = 0{,}752; prob(JB = 3{,}11) = 0{,}211,$, *** significant coef;				

Table 2.3 3rd model estimation

Model: Panel EGLS (Cross-section weights) *Dependent variable*: **Exports growth**				
Independent variable	*Name*	*Coefficient*	*St.Error*	*t-stat*
Developed country	DUMMY_DEVELOPED	977.51*	509.5048	1.918559
The WTO member	DUMMY_WTO	-0.485*	0.255448	-1.899531
Urban population growth	URB_POPUL_GROWTH	-0.049**	0.019202	-2.533998
Years of the WTO membership	YEARS_WTO	-0.150*	0.077897	-1.928367
Export volume index	IMP_VOLUME_IND	0.019**	0.009379	2.001636
$R^2 = 0{,}038; prob(JB = 14{,}11) = 0{,}0008$, *** significant coef., ** sign coef. at 5%, *not sign.				

Table 2.4 4th model estimation

Model: Panel EGLS (Cross-section weights) *Dependent variable:* **Imports growth**				
Independent variable	*Name*	*Coefficient*	*St.Error*	*t-stat*
Developed country	DUMMY_DEVELOPED	-1802.925***	458.452	-3.932636
The WTO member	DUMMY_WTO	0.904866***	0.229	3.937837
Urban population growth	URB_POPUL_GROWTH	0.902136***	0.161	5.614344
Years of the WTO membership	YEARS_WTO	-0.059*	0.031	-1.850936
Export volume index	EXP_VOLUME_IND	0.656***	0.033	19.76980
$R^2 = 0{,}538; prob(JB = 5{,}36) = 0{,}068$, *** significant coef., * not sign.				

Table 2.5 5th model estimation

Model: Panel EGLS (Cross-section weights) *Dependent variable:* **Log (Exports)**				
Independent variable	*Name*	*Coefficient*	*St.Error*	*t-stat*
The WTO member	DUMMY_WTO	0.007471***	2.22E-05	336.7910
Urban population	URB_POPUL	-0.001444*	0.000775	-1.861826
Years of the WTO membership	YEARS_WTO	0.035974***	0.001888	19.05131
Log (GDP per capita)	LOG(GDP_ PER_ CAPITA)	0.997441***	0.008029	124.2292
$R^2 = 0{,}96; prob(JB = 187{,}2654) = 0{,}000$ *** significant coef., * not sign.				

Table 2.6 6th model estimation

Model: Panel EGLS (Cross-section weights) *Dependent variable:* **Log (Imports)**				
Independent variable	*Name*	*Coefficient*	*St.Error*	*t-stat*
The WTO member	DUMMY_WTO	0.007895***	2.09E-05	378.5537
Urban population	URB_POPUL	-0.001850***	0.000709	-2.609446
Years of the WTO membership	YEARS_WTO	0.036901***	0.001950	18.92643
Log (GDP per capita)	LOG(GDP_ PER_ CAPITA)	0.908286***	0.007530	120.6233
$R^2 = 0{,}96; prob(JB = 167{,}2654) = 0{,}000$ *** significant coef., * not sign.				

Table 2.7 7th model estimation

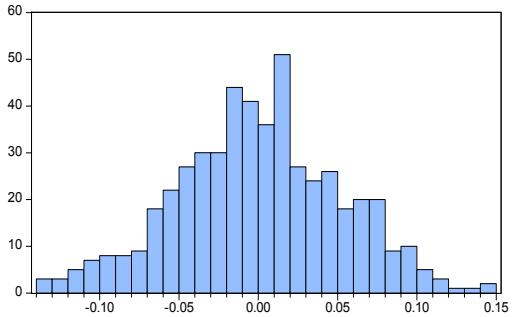
Model: Panel EGLS (Cross-section weights) *Dependent variable:* **Log (Exports)**				
Independent variable	*Name*	*Coefficient*	*St.Error*	*t-stat*
Developed country	DUMMY_DEVELOPED	534.6026***	31.91488	16.75089
The WTO member	DUMMY_WTO	-0.258402***	0.015925	-16.22663
Urban population	URB_POPUL	0.022277***	0.002225	10.01151
Log(GDP of neigbours)	LOG(GDP_NEIGH)	0.536445***	0.023712	22.62343
$R^2 = 0{,}87; prob(JB = 0{,}5472) = 0{,}76$ *** significant coef., * not sign.				

Table 2.8 8th model estimation

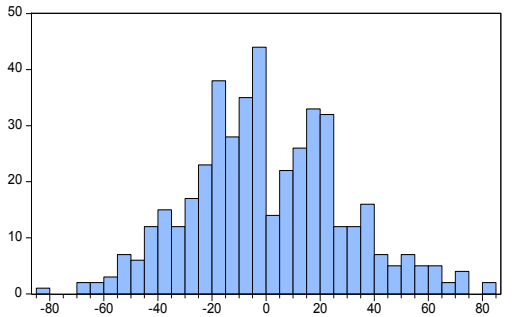
Model: Panel EGLS (Cross-section weights) *Dependent variable:* **Log (Imports)**				
Independent variable	*Name*	*Coefficient*	*St.Error*	*t-stat*
Developed country	DUMMY_DEVELOPED	481.1683***	31.46877	15.29034
The WTO member	DUMMY_WTO	-0.231497***	0.015709	-14.73680
Urban population	URB_POPUL	0.020394***	0.002199	9.272442
Log(GDP of neigbours)	LOG(GDP_NEIGH)	0.525387***	0.023404	22.44823
$R^2 = 0{,}7; prob(JB = 0{,}9949) = 0{,}61$ *** significant coef., * not sign.				

Appendices
Appendix 1:

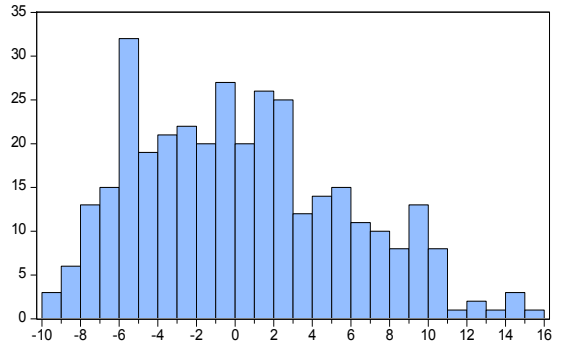
Residuals. Model 1



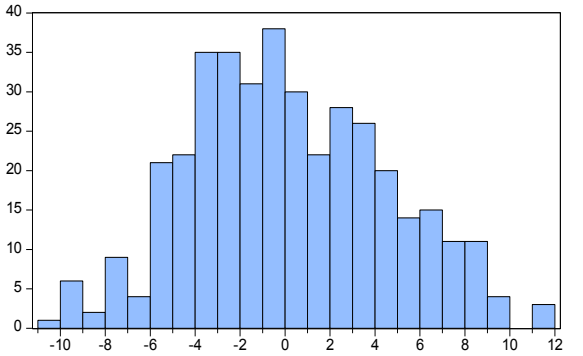
Residuals. Model 2



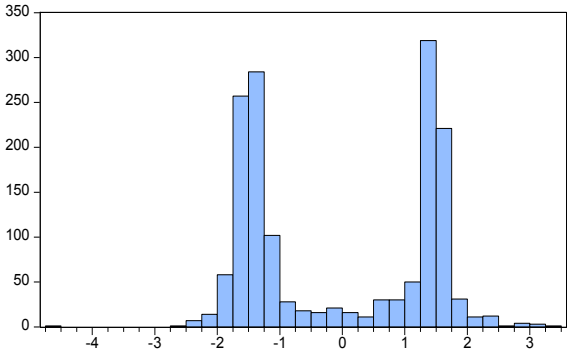
Residuals. Model 3



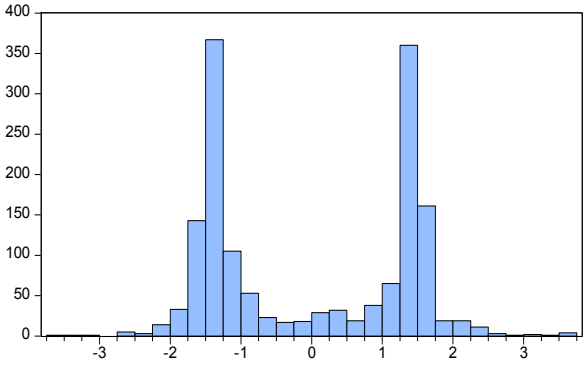
Residuals. Model 4



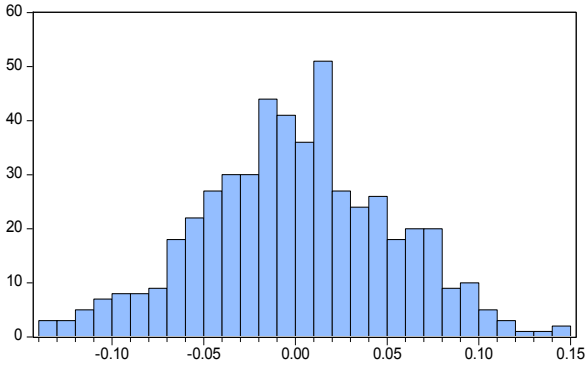
Residuals. Models 4, 5, 6, 7 (by the order)



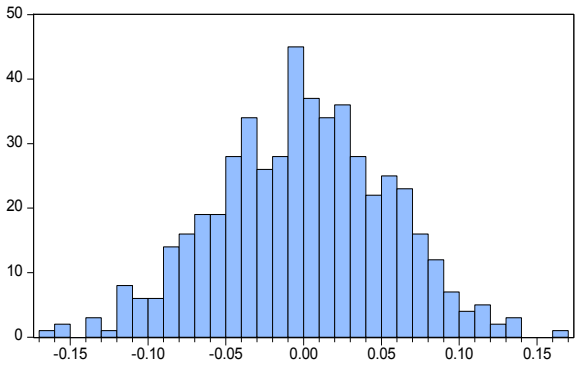
Series: Standardized Residuals	
Sample 1996 2011	
Observations 1547	
Mean	-0.052666
Median	-0.457539
Maximum	3.374430
Minimum	-4.668724
Std. Dev.	1.461268
Skewness	0.086251
Kurtosis	1.304282
Jarque-Bera	187.2654
Probability	0.000000



Series: Standardized Residuals	
Sample 1996 2011	
Observations 1548	
Mean	-0.013393
Median	-0.169785
Maximum	3.689873
Minimum	-3.532764
Std. Dev.	1.415668
Skewness	0.073567
Kurtosis	1.395728
Jarque-Bera	167.3992
Probability	0.000000

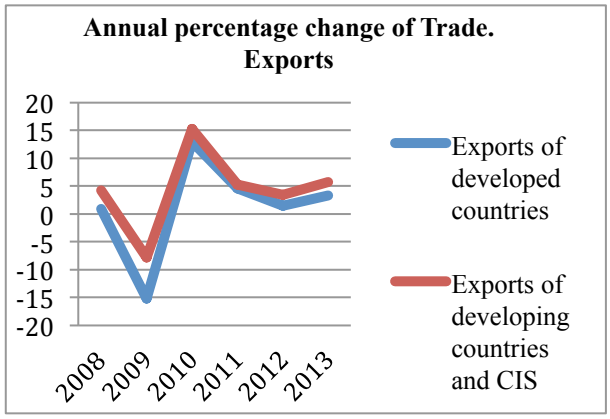


Series: Standardized Residuals	
Sample 1997 2011	
Observations 508	
Mean	4.31e-05
Median	-0.000796
Maximum	0.144549
Minimum	-0.138220
Std. Dev.	0.051867
Skewness	-0.044053
Kurtosis	2.865500
Jarque-Bera	0.547223
Probability	0.760627

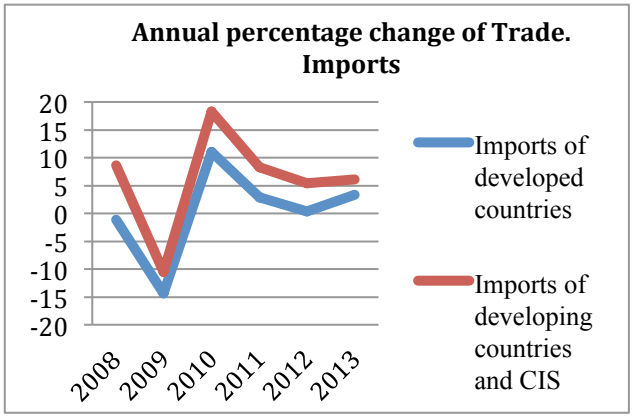


Series: Standardized Residuals	
Sample 1997 2011	
Observations 511	
Mean	-0.000947
Median	-0.000387
Maximum	0.164683
Minimum	-0.168109
Std. Dev.	0.055480
Skewness	-0.076963
Kurtosis	2.848222
Jarque-Bera	0.994955
Probability	0.608063

Appendix 2: Annual Percentage Change of Trade (Exports, Imports)



Annual % Change of Merchandise Trade; Export.
Source: WTO Secretariat, Author's Calculations



Annual % Change of Merchandise Trade; Export. Source:
WTO Secretariat, Author's Calculations

Appendix 3: Developed and Developing Countries and the Date of the WTO Accession

Albania (2000)
Angola (1994)
Antigua and Barbuda (1987)
Argentina (1967)
Armenia (2003)
Australia (1948)
Austria (1951)
Bahrain (1993)
Bangladesh (1972)
Barbados (1967)
Belgium (1948)
Belize (1983)
Benin (1963)
Bolivia (1990)
Botswana (1987)
Brazil (1948)
Bulgaria (1996)
Burkina Faso (1963)
Burma(Myanmar) (1948)
Burundi (1965)
Cameroon (1963)
Canada (1948)
Cape Verde (2008)
Central African Rep. (1963)
Chad (1963)
Chile (1949)
China (2001)
Colombia (1981)
Congo, Dem. Rep. of (Zaire) (1971)
Congo, Rep. (1963)
Costa Rica (1990)
Cote D'Ivoire (Ivory Coast) (1963)
Croatia (2000)
Cyprus (1963)
Czech Republic (1993)
Denmark (1950)
Djibouti (1994)
Dominica (1993)
Dominican Rep. (1950)
Ecuador (1996)
Egypt (1970)
El Salvador (1991)
Estonia (1999)
Fiji (1993)
Finland (1950)
France (1948)
Gabon (1963)
Gambia (1965)
Georgia (2000)
Germany (1951)
Ghana (1957)
Greece (1950)
Grenada (1994)
Guatemala (1991)
Guinea (1994)
Guinea-Bissau (1994)
Guyana (1966)
Haiti (1950)
Honduras (1994)
Hong Kong (1986)
Hungary (1973)
Iceland (1968)
India (1948)
Indonesia (1950)
Ireland (1967)
Israel (1962)
Italy (1950)
Jamaica (1963)
Japan (1955)
Jordan (2000)
Kenya (1964)
Korea, South (R) (1967)
Kuwait (1963)
Kyrgyz Republic (1998)
Laos (2013)
Latvia (1999)
Lesotho (1988)
Lithuania (2001)
Luxembourg (1948)
Macedonia (2003)
Madagascar (1963)
Malawi (1964)
Malaysia (1957)
Maldives (1983)
Mali (1993)
Malta (1964)
Mauritania (1963)
Mauritius (1970)
Mexico (1986)
Moldova (2001)
Mongolia (1997)
Montenegro (2012)
Morocco (1987)
Mozambique (1992)
Namibia (1992)
Nepal (2004)
Netherlands (1948)
New Zealand (1948)
Nicaragua (1950)
Niger (1963)
Nigeria (1960)
Norway (1948)
Oman (2000)
Pakistan (1948)
Panama (1997)
Papua N. Guinea (1994)
Paraguay (1994)
Peru (1951)
Philippines (1979)
Poland (1967)
Portugal (1962)
Qatar (1994)
Romania (1971)
Russian Federation (2012)
Rwanda (1966)
Samoa (2012)
Saudi Arabia (2005)
Senegal (1963)
Sierra Leone (1961)
Singapore (1973)
Slovak Republic (1993)
Slovenia (1994)
Solomon Islands (1994)
South Africa (1948)
Spain (1963)
Sri Lanka (1948)
St. Kitts & Nevis (1994)
St. Lucia (1993)
St. Vincent & Gren.(1993)
Suriname (1978)
Swaziland (1993)
Sweden (1950)
Switzerland (1966)
Chinese Taipei (2002)
Tajikistan (2013)
Tanzania (1961)
Thailand (1982)
Togo (1964)
Tonga (2007)
Trinidad & Tobago (1962)
Tunisia (1990)
Turkey (1951)
Uganda (1962)
Ukraine (2008)
United Arab Emirates (1994)
United Kingdom (1948)
United States (1948)
Uruguay (1953)
Vanuatu (2012)
Venezuela (1990)
Vietnam (2007)
Zambia (1982)
Zimbabwe (1948)

Appendix 4
List of Developed Countries in the World: World Bank Classification (Total #70)

Australia
Austria
Belgium
Canada
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Japan
Korea, Rep.
Luxembourg
Netherlands
New Zealand
Norway
Poland
Portugal
Slovak Republic
Slovenia
Spain
Sweden
Switzerland
United Kingdom
United States
Andorra
Aruba
Bahamas, The
Bahrain
Barbados
Bermuda
Brunei Darussalam
Cayman Islands
Channel Islands
Croatia
Curaçao
Cyprus
Equatorial Guinea
Faeroe Islands
French Polynesia
Greenland
Guam
Hong Kong SAR, China
Isle of Man
Kuwait
Liechtenstein
Macao SAR, China
Malta
Monaco
New Caledonia
Northern Mariana Islands
Oman
Puerto Rico
Qatar
San Marino
Saudi Arabia
Singapore
Sint Maarten (Dutch part)
St. Kitts and Nevis
St. Martin (French part)
Trinidad and Tobago
Turks and Caicos Islands
United Arab Emirates
Virgin Islands (U.S.)