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THE IMPACT OF THE EURASIAN CUSTOMS UNION ON THE ECONOMY OF KAZAKHSTAN

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by

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This thesis is dedicated to the memory of my grandfather

Isa Aituar

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ABSTRACT

The dissertation investigates the effect of changes in trade policy in Kazakhstan due to establishment of the Eurasian Economic Union (EEU). The study provides new evidence on the effects of Customs Union (CU) on its members. EEU started as Customs Union between Russia, Kazakhstan and Belarus which was established in 2010. Customs union became EEU in January 2012, when new international agreements, which allowed free movement of capital and work force between three countries, were put into force. Armenia and Kyrgyzstan joined EEU in 2015.

According to theory, the main consequences of entry to the CU are an increase in tariff barriers and a decrease of non-tariff barriers between countries of the CU. The decrease of non-tariff barriers between countries of the CU might lead to trade creation between CU members, and could make Kazakhstan's market more attractive for FDI inflows. The increase in the common external tariffs (CET) with non-members of CU might lead to trade diversion with suppliers outside the CU; however, it might also lead to investment creation of horizontal FDI as it might motivate firms that supplied market through export to "jump" the high CET through establishing production in the host country. Sanction wars of one of the member of the CU could either increase the trade between neighbours and sanctioning countries, (trade might fall due to the increase transportation costs), or trade might increase as neighbour of sanctioned country may become a transport hub of supplies to target country for products banned by sending countries.

The dissertation focuses on applying econometric methods to analyse the effect of the Eurasian Economic Union (EEU) on the economy of Kazakhstan. In the empirical work, time series and panel data techniques are used. The results suggest that the increase of tariff rates after the establishment of EEU decreases imports to Kazakhstan from non-EEU countries and attract FDI inflows in non-extractive industries; and that decrease of non-tariff barriers between EEU countries does not make Kazakhstan's market more attractive for FDI inflows, but increases exports from Kazakhstan to other ECU countries. In addition, sanction wars between Russian and Western countries moderately affected imports to Kazakhstan from Western countries.

Declaration

I confirm that this is my own work and the use of all material from other sources has been properly and fully acknowledged.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ADB - Asian Development Bank

ADF - Augmented Dickey-Fuller test

BIC - Schwarz Bayesian information criterion

CET - Common External Tariff

CIS - Commonwealth of Independent States

CU - Customs Union

CUSFTA - Canada–United States Free Trade Agreement

EBRD - Eurasian Bank of Reconstruction and Development

ECU - Eurasian Customs Union

EDB - Eurasian Development Bank

EurAsEC - Eurasian Economic Community

EEU - Eurasian Economic Union

FE - Fixed Effects estimation method -

FDI - Foreign Direct Investment

Free Trade Agreements – FTA

GDP – Gross Domestic Product

GMM - Generalized Method of Moments estimator

GTAP - Global Trade Analysis Project

HS - Harmonized System

IPS - Im, Pesaran and Shin panel unit root test

KZT – Kazakhstan Tenge

LSDV - Least Squares Dummy Variable estimation method

LLC - Levin, Lin and Chu panel unit root test

MERCOSUR - Free Trade Agreement between Argentina, Brazil, Paraguay, Uruguay and Venezuela

MG - Mean Group estimator

NTB - Non-tariff Barriers North American Free Trade Agreement (NAFTA)

OLS – Ordinary Least Squares estimation method

OECD - Organization for Economic Cooperation and Development

PMG - Pooled Mean Group estimator

TNC - Transnational Corporation

TSLS - Two Least-Squares estimator

USSR - Union of Soviet Socialist Republics

USD - United States Dollar

CHAPTER 1: INTRODUCTION

The creation of the Eurasian Customs Union (ECU) goes back to the disintegration of the Union of Soviet Socialist Republics (USSR) in 1991. The Commonwealth of Independent States (CIS) were part of one large country and the states were economically interdependent on each other; thus there was a need for an integration. The first integration step was made in April 1994, when almost all CIS countries (except Turkmenistan) signed a free trade agreement (FTA). The second step was made in 1995, when Russia, Kazakhstan and Belarus signed an act on the Customs Union (CU), however this act was not factually implemented (Djamankulov, 2011). Then, in 2000, the CU became the Eurasian Economic Community (EurAsEC), with 5 members – Russia, Kazakhstan, Belarus, Kyrgyzstan and Tajikistan.

The final goal of EurAsEC was to create a common market between CIS countries (Belitski, 2009); however, in the early part of the 21st century the integration process slowed down and the parties lost interest in EurAsEC. Further integration presupposed that any amendment to trade policy would be decided on a supranational level and no state wanted to lose the ability to regulate its trade independently. Then, during the world financial crises of 2008-2009, the CIS countries experienced severe economic recession. This was a landmark for promoting integration for some CIS countries, as the governments of these countries started to think about new ways to boost and diversify their economies. The customs union between Russia, Kazakhstan and Belarus was established in 2010 and the Customs Code, the Common External Tariff (CET) and supranational body (Eurasian Economic Commission), were created. As a result three countries, namely Russia, Belarus and Kazakhstan became a single customs territory, in which common tariff and non-tariff measures were applied to foreign trade.

The Customs union became the Eurasian Economic Union (EEU) in January 2012, when a new international agreement, which allowed free movement of capital and work force between three countries, came into force (Laruelle and Peyrouse 2012). The integration agreement included sections on unified policies on agriculture, labour migration, financial market regulation, competition policy, natural monopolies, trade in services and investment, foreign trade policy, macroeconomic policy and energetics. During work on the project, the Kazakhstani side protected the inclusion in the treaty of clauses related to citizenship, legal assistance, border security, common parliament, passport and visa policies, monetary policy, export controls, defence, security, health, education, science and culture. Thus, these issues

were excluded from the agreement on economic integration. Armenia and Kyrgyzstan joined the EEU in 2015.

The Kazakhstani government considers itself a founder of the EEU project as the idea was first put forward in 1994 by the Kazakhstani president Nursultan Nazarbayev (Khitakhunov, Mukhamediyev and Pomfret, 2016). Kazakhstan sees the EEU as a purely economic project, allowing Kazakhstani firms access to a market with a population of 170 million. Competition with Russian and Belarussian firms will help Kazakhstani companies to prepare for global competition within the framework of the WTO. Kazakhstan also hopes that access to the bigger market will make Kazakhstani companies more attractive into investors and bring more foreign investments to Kazakhstan.[1]

In contrast, some scholars view the EEU as a political project, in terms of an attempt by Russia to influence ex-soviet countries (including Kazakhstan). For example, Popescu (2014) stated that "Russia's Eurasian Union" was an attempt by Russia to re-establish its geopolitical significance. The importance of Russia as the main trading partner of the CIS countries has decreased significantly during the last two decades. He writes that Russia joined the ECU in order to sustain its economic influence on CIS countries, as the creation of the CU imposed limits on the relationship of CIS countries with countries outside the union through a common external tariff. Popescu (2014) suggested that the Ukrainian crisis and the annexation of Crimea put additional pressure on the Kazakhstani leadership as they might fear Crimea as a precedent for North Kazakhstan, which has a large Russian population.

Many articles (Aslund, 2013, Popescu, 2014 and Dreyer et al., 2014) have been written on the political drivers and consequences of the ECU. The purpose of this thesis is to determine the economic effect of the ECU on the economy of Kazakhstan, leaving political considerations aside. The main goal of Kazakhstan's entrance to the ECU was to increase foreign direct investment (FDI) and trade flows to its economy. This research is an attempt to determine whether Kazakhstan benefitted in these two areas.

The economic analysis will be focussed on the impact of the ECU on Kazakhstan's trade and FDI flows. As Kyrgyzstan and Armenia joined the union only in 2015, this thesis will consider the ECU as a union of its core countries, namely Russia, Kazakhstan and Belarus.

[1]European Council on Foreign Relations (2015) Kazakhstan and Eurasian Economic Union: The view from Kazakhstan

This thesis will give a better understanding of trade and FDI flows for Kazakhstani policy makers.

This thesis consists of 6 Chapters including an introduction and a conclusion. Chapter 2 is a contextual Chapter in the sense that it investigates changes in FDI and trade activities since the inception of the ECU, based on a review of the relevant literature and an analysis of the current economic situation in Kazakhstan and in the other ECU countries. Based on the contextual chapter, we establish the main consequences of Kazakhstan's entry to ECU and the effect on trade and FDI flows to Kazakhstan. The outcome of this part form the basis of the research questions which are considered in the following chapters.

The second part of this research is an empirical analysis and consists of chapters 3, 4 and 5. These chapters discussed separate research hypotheses, theoretical models, empirical methods, data sources, results and concluding remarks. Chapter 3 introduces the theoretical framework and empirical model for an analysis of the impact of the consequences of the ECU on the trade flows of Kazakhstan. Chapter 4 is concerned with estimation and the results of an economic analysis of the impact of the ECU on FDI inflows to Kazakhstan. Chapter 5 considers whether the trade wars of Russia and Western countries, resulting from sanctions imposed by the latter, have affected the trade flows of Kazakhstan.

This dissertation has developed a systematic analysis of the impact of the ECU. It empirically investigates the link between FDI, trade, and change in trade policy. In addition, it analyses the effect of the sanctions on the trade of the target countries' CU neighbors. The dissertation contributes to the literature by using latest available industry and country level data. This study extends the previous papers on ECU in the following way:

First, the dissertation uses most recent data to analyse the impact of ECU policies on trade flows of Kazakhstan. In this study we separate the effect of the changes in tariffs and non-tariffs barriers, whereas previous studies did not separate these effects. However, this approach ignores the fact that these two consequences of CU have dissimilar effect on FDI and trade flows. The increase in tariff leads to the decrease of trade with non-members of the CU and the decrease in non-tariff barriers would lead to a deeper integration and more trade with countries' members of the CU.

Second, this thesis is among the first to conduct an industry-level analysis on FDI in Kazakhstan. Whilst most papers on FDI in Kazakhstan are concerned with the total volume

of FDI. In addition, there is limited research on the effect of change in trade policy on FDI flows to Kazakhstan. In comparison with the other studies our result shows more positive outcome of the ECU for Kazakhstan. The Customs Union's positive impact on FDI flows is important for future policymaking because it shows the Customs Union did have benefits for Kazakhstan. The World Bank's (2012) results are mostly negative, but they do not show how the Customs Union impacted foreign investment. My results challenge the idea that the Customs Union had only a negative impact on Kazakhstan by showing the Customs Union's positive impact on FDI flows.

Third, in this thesis we estimated the effect of the consequences of sanctions against Russia on agricultural, oil, and gas industries of Kazakhstan. One of the gaps of the literature on sanctions is that no one analyzed what happened with CU neighbor of target countries except of Slavov (2007) which remains the only one empirical study. However, Slavov (2007) used the total trade as independent variable, whereas, trade embargoes usually target specific types of goods. In this study we analyze the impact on the imports of goods that were sanctioned. To aggregate the data we developed sanction index, which serves as an indicator on whether the sanctions harmed economies of countries which are in the CU with the target country. The approach and sanction index developed in this study are generalizable to other custom unions, blocks, and countries subjected to sanctions. Furthermore, this approach provides a framework that could be further used in other publications explaining effectiveness of the sanctions.

Potentially, this project has important policy implications for the government of Kazakhstan and Eurasian Economic Commission. This dissertation gives the following recommendation to the policy makers in Kazakhstan and Eurasian Economic Commission.

Firstly, as this analysis demonstrated, the increase of tariff rate negatively affected imports to Kazakhstan from non-ECU countries; however, it increased FDI to manufacturing sector of Kazakhstan. Nevertheless, this effect is temporary, as due to entry of Kazakhstan and Russia, countries are obliged to lower their tariff rates by 2020. Thus, within this period it is important to encourage FDI in manufacturing industries as in 2020 Kazakhstan will have to lower the tariffs.

Secondly, the findings in Chapter 3 and 4 also suggested that the decrease of NTB between ECU countries has increased the exports of Kazakhstan; however, the NTB was not lowered enough to create an extended market effect for investors. Thus, it is important for policy

makers in Eurasian Economic Commission to work on lowering the NTB and to enhance access to the markets for the companies of the ECU region.

Thirdly, results of ARIMA analysis on imports of Kazakhstan suggest that imports of Kazakhstan were moderately disturbed by trade wars between Russia and Western countries. According to our analysis on imports of sanctioning goods to Kazakhstan, the imports of agricultural goods has decreased moderately from sanctioning countries and there are signs of trade deflection of oil and gas equipment throughout Kazakhstan to Russia. These results showed that unilateral actions of Russia might bring instability to the EEU. Thus, if union is to remain, it is important for the Eurasian Economic Commission to create a policy and guidance for such cases.

CHAPTER 2: CUSTOMS UNION THEORY AND ITS APPLICABILITY TO KAZAKHSTAN

2.1. Introduction

The last fifty years can be characterized by the "rush to discrimination" which led to an increase of regional trade agreements (Pomfret, 2006). The creation of the first substantial customs union between countries of Western Europe in 1958 – the European Customs Union served as a benchmark for the developing countries from Africa, Central and the South Americas. The second important development of regionalism was the North American Free Trade Agreement (NAFTA) in 1990, which also had followers from developing countries. However, by the first half of the 20th century most of the regional trade agreements between developing countries had failed. According to Pomfret (2006), the collapse of these trade agreements was due to the desire of each member of the agreement to sell merchandise produced by its own inefficient firms and the reluctance to buy the low quality or expensive production of its partners. The new wave of the regional integration was led by Asian countries. Japan, South Korea, Singapore, Australia, New Zealand, USA, Mexico and other countries have started negotiations on trade agreements in the early 2000s (Pomfret, 2006).

The similarities between the CU and other trade agreements were described in Krueger's work (1997). The five types of trade agreements were constructed according to the following categories: preferential trading agreement, free trade agreement, CU, common market and single market. Definitions from Krueger (1997) are given in Table 2.1 below. As we can see from this table, for members of free trade agreements (FTA) there are no tariff barriers between each other. A broader definition of a FTA is given by the Organization for Economic Cooperation and Development (OECD).[2] The OECD also adds that countries of a FTA need also to consider elimination of the non-tariff barriers between each other. Table 2.1 shows that the unique difference between a CU and other preferential trade agreements is that the former adopts a common external tariff (CET), which is used by all members of the CU in respect to countries outside CU. Based on the definitions of OECD and Krueger (1997) the consequences of entrance to CU might be summarized in 2 points: (1) elimination of trade barriers between the members of CU; and (2) establishment of CET for imports for the countries outside of the CU.

[2] "A free trade area is a grouping of countries within which tariffs and non-tariff trade barriers between the members are generally abolished but with no common trade policy toward non-members. The North American Free Trade Area (NAFTA) and the European Free Trade Association (EFTA) are examples of free trade areas." (OECD, glossary of statistical terms)

Table 2.1: Types of trade agreements

Type	Description
Preferential trading arrangement	"Any trading arrangement which permits the importation of goods from countries signatory to the preference at lower rates of duty than those imposed on imports from third countries. A preferential arrangement may be partial (such as 50% duty reduction) or total with respect to the amount of duty reduction and with respect to the commodity coverage of the arrangement." (Krueger, 1997)
Free trade agreement	"A preferential arrangement in which tariff rates among members are zero, although external tariffs may be at different rates for different members of the arrangement." (Krueger, 1997)
Customs union	"An arrangement in which there is zero duty between members on imports of goods and services, and a common external tariff." (Krueger, 1997)
Common market	"A Customs union, in which not only the movement of goods and services, but also of production factors, is relatively free among member countries. In practice, of course, an FTA might provide for some arrangements permitting greater mobility of production factor. However, a common market normally refers to an arrangement whereby of countries enter into a CU and also permit free, or at least greatly increased, mobility of factors of production among members." (Krueger, 1997)
Single market	"A common market in which all producers and consumers within the arrangement are governed by the same rules, in the sense that participants in one geographic part of the market may not be prevented from operating in another part of the market." (Krueger, 1997)

Source: definitions are taken from Krueger, A. O. 1997. Free trade agreements versus CUs. Journal of Development Economics.

The motivation to enter the CU might differ depending on a country's status of development. The motives of developed countries are mainly political and offer preferential treatment to reach commercial and diplomatic goals (Feinberg, 2003). While preferential

agreements do not bring economic benefits to developed countries, they do offer low-cost solutions for meeting political objectives (Pomfret, 1997). Developing countries mainly pursue economic goals to ensure guaranteed market access or "exporting motive" with the lowering of trade barriers benefitting the country's exporters. If the preferential treatment is reciprocal, then all partners will be favoured exporters of some products, and will enjoy gains from increased exports. (Pomfret, 1997, p 333). The presence of transnational corporations (TNCs) complicates the "exporting motive". TNCs might invest in a small country with access to the larger market in order to get access to the extended market of all countries within the preferential trade agreement (Pomfret, 1997, p 333). Thus, some of the developing countries are also motivated by the opportunity to attract more foreign direct investments to their economies.

Further integration is however not without costs as a CU might also sharpen the macroeconomic vulnerabilities as countries become more integrated. Shocks to the trade of one of the members of the CU could spread to the other members more quickly. The trade policy, negative or positive, introduced in one of the countries of CU might also influence the trade flows of other members. For example, a negative discrimination trade policy, or sanctions against one of the members of CU might impact all CU members if they have created a single customs territory and abolished customs controls between each other. In this case, imports from sanctioning countries will decrease not only in the target country but also in its CU partners.

The next section 2.2 presents a theory on the effect of CU on trade. Section 2.3 considers (the theory) on the effect of a CU on FDI. Section 2.4 analyses how trade sanctions on one of the CU members affect its neighbours. Sections 2.5 and 2.6 provide a literature review on the ECU and sanctions against Russia. Section 2.7 develops questions to be tested in the following chapters 3, 4, 5.

2.2. Theory about the effect of the Customs Union on trade flows

Viner (1950) has determined when a CU has trade-creating and trade-diverting effects. Trade creation occurs when countries create a CU which eliminates custom tariffs, causing price reductions and the possibility of a trade flow creation. The country that creates a CU with a more efficient partner will pay less and this will lead to an efficiency gain for the country's citizens. Trade diversion occurs when a country creates a CU with a less efficient producer, where the producer with lower costs suffers the disadvantage of paying tariffs; thus,

trade is diverted from the more efficient non-partner country in favour of the less efficient partner country. The country that creates a CU with a less efficient partner will pay more and this will lead to an efficiency loss for the country's citizens.

Viner (1950) and Lipsey (1960) have discussed both negative and positive outcomes of a CU. They have concluded that a CU could lead to a sizable decrease in trade flows if tariff protection in member countries increases after the establishment of a CU. Kemp (1976) and Ohyama (1972) have found that it is possible to enhance welfare by adjusting the common external tariff (CET) at just the right level to get a Pareto improvement of trade flows.

It is, however, hard to believe that CU countries will consider the costs of non-members in setting up the CET. As Pomfret (2006) points out, the proposition of Kemp (1976) does not consider the negotiation costs and requires CU countries to care about the welfare of countries outside of the CU. Krugman (1991) models the world where every country is a member of one of the trading blocks. He tried to find whether the formation of the trading blocs was good or bad for world welfare and suggested that a bigger CU would lead to higher CET. A large trading organization has more market power, which would eventually be used to improve the terms of trade via higher CET. Thus, the creation of the CU might lead to a higher CET. The motivation for higher tariffs is bigger if there is a member with bargaining power and high import tariffs. Kennan and Riezman (1988) found that the biggest member of the CU would set the CET and smaller countries (which might be more liberalized) would eventually agree with the decision.

Through a three country model which stimulated different endowment structure, Kennan and Riezman (1990) came to the same conclusion as Krugman (1991); that the change in tariff rates in a CU and a FTA will differ, because in the FTA's case countries establish a CET unilaterally, whereas in the CU's case countries decide upon the CET multilaterally. There is no increase in market power when countries are allowed to independently set the external tariff. Another reason why the setting of a CET in a FTA and a CU differ is the possibility of trade deflection. Trade deflection is when an FTA member with the lower tariff rate re-exports merchandise to its FTA partner with the higher tariffs, and thus, there is an incentive to lower the tariff rates when you enter the FTA. The problem of trade deflection can be prevented by establishing the rules of origin; however, rules of origin does not work if the country with the low tariff rates produces a product, which it re-exports from a non-member country (Pomfret, 2006).

Based on the arguments above, there are two conclusions. First, entry to the CU can lead to a trade creation due to the emergence of new trade flows arising due to deeper integration

between the CU members. The cancellation of tariff rates and the decrease in non-tariff barriers between the countries might replace inefficient domestic suppliers with the more efficient members of the CU. Second, entry of a country to CU is likely to cause tariff protection to increase. The increase in the CET with non-members of the CU might lead to trade diversion as more efficient suppliers outside of the CU might be displaced by the less efficient ones from one of the partner countries.

2.3. Theory about the effect of the Customs Union on FDI flows

One could argue that the main disadvantage of entry of a country to a CU is that the country would be more likely to trade with the members of the CU than with the rest of the world due to the increase in CET. However, a high CET might affect FDI flows. Barriers to trade are considered as a potential determinant of FDI by a number of different approaches. The increase of tariff barriers would raise the marginal cost of exports relative to the production abroad, which would drive the an increase in investments from multinationals if we assume that multinational companies want to serve the foreign market in the most cost-effective way. This leads to the substitution effect on exports and growth in what is called "tariff-jumping" FDI. According to these models, the increase in tariffs would increase the so called "tariff-jumping" FDI that substitutes exports (Caves, 1996).

The consequences of the increase in trade barriers and the decision to join a CU could differ, depending on whether FDI and exports are complements or substitutes, which depends on the type of FDI. FDIs can be vertical and horizontal (Marcus, 1995, Helpman, 1984). A vertical FDI is where multinationals have different stages of production in different countries. In this type of FDI the multinational aim is to serve the domestic market, whereas in horizontal FDI (tariff-jumping), the investor's aim is to serve the foreign market. In the "tariff-jumping" FDIs, multinationals are duplicating almost the same activities in various countries. Favourable conditions for horizontal FDIs includes a big market size of the host country and high tariff barriers; in this way an increase in the CET can motivate firms outside of the CU, which supplied the host market through export prior to the formation of the CU, to "jump" the high CET through establishing production in the host country.

The impact of membership in a CU on FDI inflows from firms outside of FDI can be ambiguous and depends on the type of FDI, which prevails in the country. If the FDI is vertical, the increase in tariff barriers can increase the cost of transactions in vertical integration across borders, thereby decreasing FDI. Whereas if the FDI is horizontal, the increase in trade

barriers will probably lead to an increase in FDI, as firms enter a market through FDI. This can happen because alternative ways to serve a domestic market, namely exports, incur higher transaction costs.

Another reason why a country might attract more FDIs after entry to a CU is the reduction of tariff and non-tariff barriers between members of the CU; thus, investors have access to the extended market of the CU because there are no barriers to trade between CU countries (Ethier, 1998). FDI flows to countries may decrease or increase depending on how FDI is distributed between countries of a CU. Before the establishment of a CU, an investor might have invested in all the CU countries, but when barriers to trade decrease, the investor might decide to exploit an economy of scale, investing in only one of the CU countries and export to the rest of the CU from the chosen country (Buckley, 2001). The key factors that determine the outcomes of the re-distributive game, are infrastructure, tax policy for multinational companies, quality of institutions and labour force (Yeyati, 2002).

Based on the arguments above, there are two conclusions regarding the effect of the CU on FDI and trade flows to the host country. First, an increase in a CET with non-members of the CU can lead to trade diversion, but it can also lead to investment through the creation of a horizontal FDI; this can motivate firms that supplied market through export to "jump" the high CET through establishing the production in the host country. Second, the cancellation of tariff rates and the decrease in non-tariff barriers can create an expanded market effect. A domestic market might be not large enough for companies to consider investment, but the enlarged market could justify the entrance of multinational corporations to the market through FDIs. The elimination of trade barriers might also divert FDI inflows as the country might lose the FDI re-distributive game.

2.4 Theory on the effect of trade sanctions on the target's CU neighbours

Theories regarding the effect of trade sanctions on trade flows of the target country suggests that trade sanctions are not effective due to the substitutability of goods (Bayard et al., 1983, Willett and Jalalighajar, 1984). Kaempfer and Lowenberg (2007) using an offer curve approach came to the conclusion that trade sanctions will likely disrupt economic relations between warring parties and worsen target countries' terms of trade. As Kaempfer and Lowenberg stated, "the degree to which the sanctions impose costs on these nations depends on the number and size of other countries willing to continue trading and on the elasticities of the trade offers of those countries." (Kaempfer and Lowenberg, 2007, p.875).

Inevitably, sanctions will produce opportunities for the countries which are not part of the sanctioning coalition, to benefit by trading with a sanctioned country. These countries have the possibility to buy goods cheaper than world prices and to sell them for prices above the world price. The more severe the sanctions, the larger the profits from sanction-busting activities, which leads to an increase of initiatives to enter into such activities. Sanction busting is defined by Early (2009) as "a significant increase in a third-party's trade with the target following the imposition of sanctions, constituted in high enough levels so as to have a salient impact upon the economic costs the sanctions would otherwise impose." (Early, 2009, p. 58). Indeed, sanctions can harm economic bonds between sanctioned countries and their sanctioning partners; however, the sanctions might increase the trade between target countries and their non-sanctioning trade partners. Third parties may attempt to seize the economic opportunities arising after the sanctions are established (Green 1983, Drury 1998, Nourriddin 2001).

The impact of the effect of sanctions on the third countries is so far been under-looked in the literature. The existing literature is largely concerned with the effect of sanctions on trade flows of the target and non-sanctioning countries (Hufbauer et al. 1997, Caruso 2003, Yang et al. 2004). Hufbauer et al. (1997) analysed the effect of sanctions on Iran using data for the years 1985, 1990 and 1995 and found that sanctions created trade opportunities for more trade for US "competitors", such as Australia, Canada, and France. Yang et al. (2004) investigated the effect of US sanctions within a broader time span (1980-1999), his analysis confirms Hufbauer et al. (1997) findings and shows that US sanctions increased trade between targeted states and EU countries and Japan. However, Caruso's (2003) analysis of the effect of sanctions on third countries, particularly Japan, Canada, Germany, France, Italy and United Kingdom, for the years 1960-2000, does not support the findings of Hufbauer et al. (1997) and Yang et al. (2004). Caruso found that extensive sanctions decrease trade between targeted and third countries, whereas moderate sanctions show insignificant positive results. Therefore, the trade sanctions may influence the trade between members of the CU; the neighbours of the sanctioned country may try to export their own products or could become a transport hub of supplies for a target country for products banned by the sending countries. The available evidence on the role of sanctions on trade busting activities is mixed and does not question the effect of sanctions on the land neighbours or CU partners of the target country.

Another theory on the influence of the sanctions on neighbour countries was proposed by Slavov (2007), who applied a gravity equation to analyse the possible consequences of sanctions on land neighbours. Slavov (2007) found that sanctions may also decrease trade

between neighbour and sender countries by breaking up the routes of trade and increasing transportation costs. The increased costs of transportation will increase prices or decrease profit margins of the suppliers. Thus, some of the suppliers might not trade with neighbours of target country or customers of "innocent bystanders" (neighbours of target country) might buy less because of the increased price. In this case trade sanctions may decrease the trade between neighbours of sanctioned country and sending countries. Another effect of sanctions on land neighbours of target countries was found by Curovic (1997), who used a three country Heckscher-Ohlin model with two goods. She found that if neighbours import and export the same type of goods, the trade embargo can benefit the neighbours of the target country due to the amelioration of their terms of trade, but this effect is not common as most of the countries are too small to influence the terms of trade (Slavov, 2007).

Based on the arguments above, it can be concluded that a trade embargo could either increase the trade between neighbours and sanctioning countries, or trade might fall due to the increase in transportation costs. Trade might increase as neighbours of sanctioned country can become a transport hub of supplies for the target country for products banned by sending countries.

2.5. Eurasian Customs Union: literature review

There are several scholars have analysed the effect of the ECU on economies of the member countries (Vinhas de Souza, 2011; Michalopoulos and Tarr 1997; and Iskakova and Plekhanov, 2013). Vinhas de Souza (2011) argued that the creation of the Customs Union between Kazakhstan, Russia and Belarus can have a negative effect on GDP and the trading balance of the CU countries. He analysed the effect of new tariffs using a computable general equilibrium model from the Global Trade Analysis Project (GTAP). The results are unequivocally negative for all three countries. Kazakhstan, the Russian Federation and Belarus lose 0.54, 0.66 and 2.77 per cent of their GDP respectively, and their trade balances get worse by 800, 11,000 and 600 million USD, respectively. Vinhas de Souza (2011) found that ECU countries were already integrated in trade terms (the countries already have an FTA with each other), so there was no trade creation arising from the establishment of the ECU. The introduction of the "trade tax wedge" (common external tariffs) leads to the dislocation of trade flows to less efficient partners (ECU partners), which then will lead to a further decline in GDP and welfare trade diversion effects. Vinhas de Souza (2011) suggests that the

results of the GTAP model are more indicative than prescriptive; thus further research is required.

Michalopoulos and Tarr (1997) investigated the possible effects of the ECU and have concluded that as all three countries have been in a Free Trade Agreement since 1994, the effect of creating a CU cannot be significantly positive for trade between CU members, as the ECU countries are already largely integrated. A new free trade agreement between the CIS countries was signed in October 2011 (Dragneva and Kort, 2012). A fundamentally important feature of the new agreement was the presence of a tool to make parties violating the agreement to fulfil their commitments. A tool like this can be effective in resolving potential disputes. An overview of trade agreements between CIS countries was carried out by Dragneva and Kort (2012). A further conclusion of Michalopoulos and Tarr (1997) is that this trade agreement would induce inefficiency losses due to the high level of protectionism and high external tariffs in ECU.

There are two papers which have calculated average tariff rates for Kazakhstan (Jandosov and Sabyrova, 2011; and Mkrtchyan and Gnutzmann, 2012). Jandosov and Sabyrova (2011) calculated the average tariff protection level in Kazakhstan before and after the CU, accounting for almost all of the exemptions, preferences and temporary measures in place. They referred to these as average tariffs and applied tariffs. This applied tariff protection level is an ad valorem equivalent (AVE) of tariff rates including specific and combined tariffs for all countries outside of CIS. The CIS countries have bilateral free trade agreements with all three countries of the CU.

To compute applied tariff rates before and after establishment of the CU, Jandosov and Sabyrova (2011) used the import data set for 2009 and applied CET before and after founding the CU. They computed the average tariff rates for each sector and applied them to imports of the determined sector and then based on received values, average tariffs for the complete imports of Kazakhstan were calculated. They also considered transition period tariff rates negotiated by Kazakhstan for the period 2010-2014. The countries of the CU agreed that Kazakhstan would phase out lower tariff rates for 406 product lines during the transition period of 2010-2014.

Jandosov and Sabyrova (2011) concluded that there was a significant increase in Kazakhstan's tariff protection level after its accession to the CU; the simple average AVE tariff rate increased by 1.86 proportionately from 6.45% to 12.02%. Also applied tariff protection increased further during the transition period from 12.02% in 2011 to 12.24% in 2014.

Mkrtchyan and Gnutzmann (2012) looked at the data on tariffs of the CU countries before and after the establishment of ECU. Kazakhstan had significantly lower tariff rates before the ECU, whereas the tariff rates of Belarus and Russia stayed almost the same. The tariff means are calculated as simple averages of ad valorem and ad valorem-equivalents of the tariff lines on the HS6 desegregation level[3].

Table 2.2: Trends in General System of Preferences (GSP) and Most Favourite Nations (MFN) Tariffs

Year	Mean GSP tariff			Mean MFN tariff		
	Russia	Belarus	Kazakhstan	Russia	Belarus	Kazakhstan
2009	11.52	11.21	6.27	15.5	11.81	6.49
2010	10.05	9.99	9.67	10.67	10.60	10.30
2011	10.38	10.30	10.11	11.07	10.99	10.82
2012	10.23	10.16	10.01	10.94	10.87	10.74

Source: Gnutzmann and Mkrtchyan (2012, p.10)

Iskakova and Plekhanov (2013) have calculated the impact of the tariffs on the import flows of Kazakhstan. They examined the structure as well as the volume of imports using data disaggregated at the six-digit level of the Harmonized System (HS). They took the change in imports between 2009 and 2010 (before and after CU tariffs became effective) for industry-country pairs (EU, CU, other CIS and China) and regressed it on the change in statutory tariffs for the six digit HS level between 2009 and 2010. Using the ITC Trade Map time series data and tariff rates from "Kazakhstanskaya Pravda" newspaper they ran the following OLS regression:

$$\Delta \mathrm{IM}_{jt} = \alpha \Delta \mathrm{IM}_{jt-1} + \beta \Delta \delta_{jt} + \lambda \mathrm{Z}_{jt} + \varepsilon_{jt} \qquad (2.1)$$

Where $\Delta \mathrm{IM}_{jt}$ is the change in the natural log of imports between 2009 and 2010, $\Delta \mathrm{IM}_{jt-1}$ is the change in the natural log of imports between 2009 and 2008 for industry-country pairs, $\Delta \delta_{jt}$ is the change in the statutory tariffs and Z_{jt} represents other secondary variables, namely

[3] "The Harmonized System is an international nomenclature for the classification of products. It allows participating countries to classify traded goods on a common basis for customs purposes. At the international level, the Harmonized System (HS) for classifying goods is a six-digit code system" (United Nation International Trade Statistics, 2013).

the log of change in imports between 2006 and 2008 and change in the log of imports between 2008 and 2010.

The results of the regression suggest that in a worst case scenario, a 2% change in tariff leads to a 2.8% decrease in import from China, while there is no effect of a tariff increase on other parts of the world. Using the same model, Iskakova and Plekhanov (2013) extended their work to Belarus and Russia and found that the evidence does not support trade diversion in relation to the change in tariffs for these countries. The major drawback of these papers is that the researchers only used tariffs and imports of previous years to explain changes in imports before and after the establishment of the CU, and do not consider other "natural" causes of trade, such as size the of economy, distance, and exchange rates between trading partners.

As discussed by Michalopoulos and Tarr (1997), the effect of creating a CU cannot be significantly positive for the trade between CU countries, since all three ECU core countries have been in a Free Trade Agreement since 1994 and therefore, are already largely integrated. However, countries might benefit from the abolition of the customs controls, adoption of the single system of phytosanitary norms[4], and a single system of customs regulation and procedures.

The Eurasian Bank of Reconstruction and Development (EBRD) transition report (2012) compared their Business Environment and Enterprise Performance Survey of 2008 and 2012. One part of their survey evaluated the customs regulations; the management of firms were asked whether they considered the custom control as a problem. In 2008, close to 30% of respondents from Russia, Belarus and Kazakhstan answered that they saw trade regulations for customs as serious obstacle, whereas only 12% did so in 2012. The survey did not ask respondents to indicate the destination of the trade; however, the results of surveys indirectly indicate that ECU countries were facing lower barriers in 2012 than they had in 2008.

The Eurasian Development Bank (EDB, 2015) surveyed 530 firms from core ECU countries. One of the topics of the survey was the difference between access to the markets of ECU countries and access to the markets of other countries. The management of the firms were asked by EDB (2015): "How would you assess the access of your export products to the markets of the CU compared to exports to other countries?" Responses were on a scale from 1-5 from 1 being "much more difficult" and 5 "much easier", with 3 representing view of no difference between access to the markets of ECU countries and access to the markets of other

[4] "Sanitary and phytosanitary regulatory measures related to food safety and animal and plant health; food standards of definition, measurement, and quality; and environmental or natural resource conservation measures." (Calvin, L. and B. Krissoff, 1998).

countries. The EDB (2015) calculated an average score based only on responses from firms that export to both ECU and other countries' markets (44 from Belarus, 37 from Kazakhstan and 35 from Russia). The results show that on average companies from ECU countries feel that access to the mutual ECU market is easier than access to the markets of other countries. The average score for Belarus was 3.83, which means that ECU markets are much more open than the markets of other countries. The average scores for Russia and Kazakhstan were also higher than average (3 – no difference); Russia's average score was 3.44 and Kazakhstan's score was 3.32. The results of surveys indicate that ECU countries are facing higher barriers to other countries' markets than to their mutual market.

Further research assessing changes in non-tariff barriers due to the establishment of ECU was undertaken by the Asian Development Bank (ADB) in 2012, who collected data about the time and cost of the carrying trade from drivers every month since January 2009. Each month they randomly selected a driver who went through ECU borders, and then gathered information about cost and time is checked for completeness, consistency and accuracy; and then data normalized at 20 tons. During the year before and the year after the abolition of the customs control in ECU, ADB collected 7,348 samples. After the establishment of the ECU, the average time spent on customs for Kazakhstani trucks moving through Russian borders decreased from 7.7 to 2.9 hours. ADB (2012) has also reported that the cost of border clearance, including custom clearance, health and phytosanitary inspections did not change between 2011 and 2012; and was cheaper than in 2010.

The conclusions from the literature review on ECU are as follows:

1) Due to the entry of Kazakhstan to the ECU, the external tariffs of Kazakhstan increased significantly.

2) There was no trade creation based on the removal of the tariffs within the CU of Russia, Belarus and Kazakhstan as, since 1994, these countries were in an FTA. Hence, no extra tariff preference was given after the CU was established; however, countries might benefit from the abolition of the customs controls, adoption of the single system of phytosanitary norms[5] and a single system of customs regulation and procedures.

[5] "Sanitary and phytosanitary regulatory measures related to food safety and animal and plant health; food standards of definition, measurement, and quality; and environmental or natural resource conservation measures." (Calvin, L. and B. Krissoff, 1998).

2.6. International sanctions against Russia and their potential implications for Kazakhstan

The contradiction of opinions between Western countries and Russia, caused by the Ukrainian crisis and the crisis in Crimea, resulted in threats of sanctions against Russia by the United States and Western European countries (hereafter, Western countries) at the beginning of March, 2014 (Kalyuzhnova et al., 2016). The first sanctions of the developed countries were mostly smart and diplomatic. Russia was not invited to the G7 summit in Brussels, then various programs, such as visa agreements and bilateral cooperation programs, were cancelled. In addition, the EU-Russia summit was cancelled, bank accounts were frozen and visas were banned for people considered responsible for the crisis in Crimea and West Ukraine. Later EU and US sanctions were aimed against the actions of Russia in order to destabilize the situation in Ukraine and were targeted at access to the foreign capital markets and exports of strategic goods. There are sanctions from both sides of the conflict, as can be seen in the chronology of the sanctions in Table 2.3, below from Kalyuzhnova et al. (2016). The following economic sanctions on trade were imposed by the EU, the US, Norway, Japan and Australia, against Russia:

1. Export licenses are denied for energy-related equipment (deep water development in the Arctic, and shale);
2. Exports of military and dual-use goods are banned.

Russia reciprocated Western sanctions by banning the imports of meat, sea food, dairy, vegetables and other food products from Western countries.

Table 2.3 Chronology of sanctions against Russia, 2014 to 2015

Date - Reason
March 2014 - Crimea's accession to the Russian Federation
April 2014 - Russia was accused of supplying arms to the rebels as well as being in open support of self-proclaimed republics: Donetsk People's Republic and Lugansk People's Republic
July 2014 Malaysian Boeing-777 disaster
September 2014 Russia's alleged role in the Ukrainian crisis
July 2015 The United States extended the Ukraine-related sectorial (in particular the petrochemical sector) sanctions and sanctions on individual

Source: Table is from Kalyuzhnova et al., Y (2016, forthcoming)

These sanctions restrict the target country's access to export markets and overall terms of trade and, in response to these sanction, Russia banned food imports from the EU, US, Norway and Australia. Kalyuzhnova et al. (2016) argue that sanctions are perceived by the Russian government as an opportunity to substitute imports from sanctioning countries with domestically produced goods, as the Russian government is committed to helping local manufacturers. Kalyuzhnova et al. (2016) give an example of plans to support local producers by the state owned oil company Rosneft, which "has plans to increase the use of domestically produced equipment in new projects to 70 per cent by 2025." (Kalyuzhnova et al., 2016, p.151,). In order to affect market creation, and achieve import substitution, the Russian government needs to concentrate on helping domestic manufacturers to catch up with competitors from sanctioning countries; however, the lack of competition and diminished possibilities of attracting FDI could make the "catching up process" more difficult (Kalyuzhnova et al., 2016).

The "sanction wars" between Russia and Western countries (EU, US, Norway, Japan and Australia) could affect Russia's ECU partners' economies as their dependency on the Russian economy is very high. ECU countries may try to export its raw agro-food products or could become a transport hub of supplies to Russia for agro-food and energy related equipment banned by Western countries and Russia (Khitakhunov, Mukhamediyev and Pomfret, 2016). Sanctions may also decrease trade between ECU countries and sender countries by breaking up the routes of trade and increasing transportation costs, for example some of agriculture or energy related goods might have come to Kazakhstan through Russia's borders and with sanctions in place, the costs of trading increase because the routes of trade have to be changed. One of the main routes from the EU to Kazakhstan is through Russian borders, and with sanctions in place EU companies may face more meticulous customs controls and delays at the border. The additional time at border posts will increase transportation costs, which in turn will increase the price; thus, some of the EU companies might find it difficult to trade with Kazakhstan because of the decrease in margins.

2. 7. CONCLUDING REMARKS

This sub-section focuses on the development of the research questions from the context of sub-chapters of the theoretical survey. The CU theory will be applied in the context of Kazakhstan, which has joined the CU with Russia and Belarus in 2010. Based on the

definitions of OECD and Krueger (1997) the consequences of entry to CU can be summarized in two points:

1) the elimination of trade barriers between members of CU;

2) the establishment of CET for imports of the countries outside of the CU.

An analysis of the literature on the ECU suggested that one of the main changes in the trade policy of Kazakhstan, due to its admission to the ECU, was the increase of tariff rates for non-ECU countries, and the decrease of non-tariff barriers between ECU countries. Mkrtchyan and Gnutzmann (2012) and Jandosov and Sabyrova (2011) concluded that there was a significant increase in Kazakhstan's tariff protection level after its accession to the CU, with the simple average tariff rate increasing from 6.45% to 12.02%. In contrast, the tariff rates of Belarus and Russia stayed almost the same level.

The literature review also leads to the conclusion that there was no trade creation based on the removal of the tariffs within the CU of Russia, Belarus and Kazakhstan as, since 1994, these countries were in an FTA; hence, no extra tariff preference was given since the creation of the CU. Countries might benefit from the decrease of non-tariff barriers (NTB), such as the abolition of the customs controls, adoption of the single system of phytosanitary norms, single system of customs regulation and procedures. Research undertaken by the EBRD (2012), EDB (2015) and ADB (2012) have shown that NTB have decreased since the establishment of the ECU.

The CU might also sharpen the macroeconomic vulnerabilities as countries become more integrated. Shocks to the trade of one of the members CU could spread to the other members more quickly. The trade policy, negative or positive, introduced in one of the countries of the CU might also influence the trade flows of other members. Recently, the contradictions of opinions between Western countries and Russia, (which is one of ECU countries), resulted in bilateral sanctions between Russia and Western countries, namely EU countries, USA, Norway, Australia and Japan. EU countries, USA, Norway, Australia and Japan banned exports of oil and gas equipment to Russia, and in response Russia banned imports of agricultural products from these countries. Both Kazakhstan and Belarus refuse to participate in sanction wars between Russia and Western countries.

Based on the literature survey on the effects of CU, it can be concluded that the consequences of entry to the CU (with an increase in CET and a decrease in NTB) might influence trade and FDI flows to the country. The decrease of non-tariff barriers between countries of the CU might lead to trade creation between CU members, and create an expanded market effect. The increase in the CET with non-members of CU might lead to trade diversion

with suppliers outside the CU; however, it might also lead to investment creation of horizontal FDI as it might motivate firms that supplied market through export to "jump" the high CET through establishing production in the host country. Sanction wars of one of the member of the CU could either increase the trade between neighbours and sanctioning countries, (trade might fall due to the increase transportation costs), or trade might increase as neighbour of sanctioned country may become a transport hub of supplies to target country for products banned by sending countries.

This thesis aims to find out whether the CU theory can be applied to the Kazakhstani case. Chapter 3 introduces the theoretical framework and the empirical model for the analysis of the impact of the consequences of the ECU on the trade flows of Kazakhstan. Chapter 4 describes a method of statistical estimation and reports the results of the economic analysis on the impact of ECU consequences on FDI inflows to Kazakhstan. Chapter 5 analyses the question of whether the trade wars between Russia and Western countries distorted the trade flows of Kazakhstan.

CHAPTER 3: THE EFFECT OF THE EURASIAN CUSTOMS UNION ON THE TRADE OF KAZAKHSTAN

3.1. Introduction

The purpose of this chapter is to examine the trade effects of the CU between Russia, Kazakhstan and Belarus (ECU). Based on theory in chapter 2, the following is expected:

Firstly, the increase of the common external tariff of Kazakhstan is likely to cause a trade diversion effect.

Secondly, the decrease of non-tariff barriers between ECU countries, through the abolition of the customs controls, the adoption of the single system of phytosanitary norms, and a single system of customs regulation and procedures, is likely to cause a trade creation effect.

The analysis in this chapter is divided into two sections: (1) detecting the impact of the tariff rise in Kazakhstan; and (2) analysis of the impact of a decrease in the non-tariff costs. For both analyses the gravity model will be used. The empirical strategy is to control as many "natural" causes of trade as possible, and to assess the effects of a change of tariffs in the residual.

The main contribution of chapter are: it models the impact of the increased average tariff on Kazakhstan, this study compares the trade flows of Kazakhstan before and after the establishment of new tariffs; it models the non-tariff impact of the ECU on the trade of Kazakhstan, by comparing CIS and ECU countries' trade flows

This chapter provides an outline of the gravity model and also explains why the gravity model is appropriate for analysing trade flows. Subsequently, the theory of the panel time series techniques is outlined to provide a basic understanding of the empirical methods. Justification for the use of the dynamic gravity model to analyse trade flows is given and an econometric method used for the dynamic gravity model is described.

To sum up: Section 3.2 analyses how the trade flows of Kazakhstan have changed over time; section 3.3 provides details of the theoretical models; section 3.4 describes how the models and econometric techniques are used and reports the estimation results; section 3.5 concludes with a discussion of the results.

3.2. Analysis of ECU trade flows

In this section we analyse the trade flows of Kazakhstan using country level data. In order to analyse the effect of the increase in CET. In section 3.2.1 we analyse whether imports from Kazakhstan's main partners changed after the establishment of the ECU, and then section

3.2.2 compares Kazakhstani trade with the partners from ECU and CIS. CIS countries were chosen because these countries have an FTA with ECU countries; thus, the difference between CIS and ECU trade will allow us to see the effect of change in NTB between ECU countries.

3.2.1. Kazakhstan's import structure

Kazakhstan's economy grew very quickly from 2000-2008 and imports, exports and GDP showed unprecedented growth during this period. In 2000 GDP total exports and total imports were 18, 7 and 5 USD bn (billions of US dollars), respectively; whereas in 2008, the GDP, total exports and total imports increased to 133, 70 and 37 USD bn, respectively. Similar trends were exhibited by other transition economies, including the CIS countries (Coronel et.al, 2010); however the 2008-2010 crisis brought a sharp decline in Kazakhstan's key economic indicators in 2009 and 2010. The total value of imports at 2009 value amounted to USD 28.4 bn, significantly less than the previous year's 37.7 USD bn. After 2009, the economy started to recover and reached its previous level in 2011, and then rose to 45 USD bn in 2012 (see Figure 3.1).

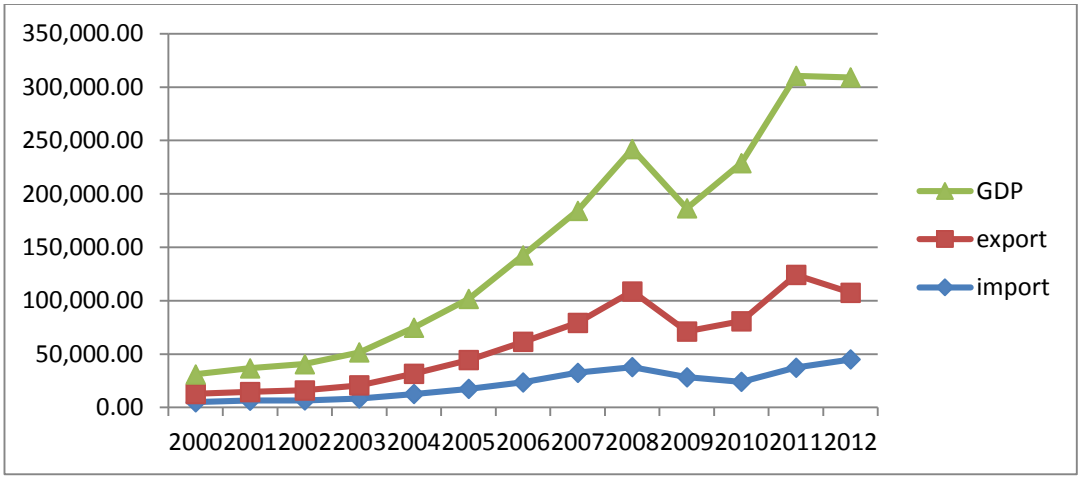


Figure 3.1 GDP, Import and Export of Kazakhstan (USD mn)

Source of data: International Monetary Fund (2015): Direction of Trade Statistics (Edition: Feb 2015)

Figure 3.2 below shows that Kazakhstan's major partners in 2012 were Russia, China and the EU. According to the IMF direction of the trade site, the overwhelming majority of imports came from the CU countries (Russia and Belarus), of which 32% were from Russia and the other 2% was from Belarus. China, with 27%, came second and 20% of Kazakhstan's imports were from the EU countries. Khitakhunov et al (2016) stated that one of the reasons for the creation of the ECU for Russia was to decrease the economic dominance of China in

Kazakhstan. We can conclude from Figure 3.2 below that in 2012 Kazakhstan was exporting from China as much as from Russia; however, it is important to see how the distribution of imports by country has changed over time.

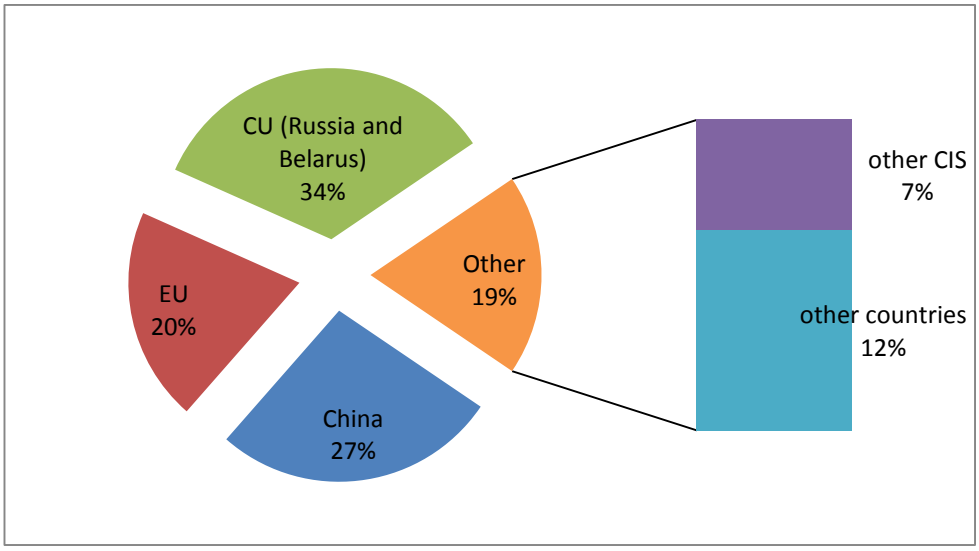


Figure 3.2 Import structure of Kazakhstan in 2012

Source of data: International Monetary Fund (2015): Direction of Trade Statistics (Edition: Feb 2015)

Figures 3.3 below illustrates how the distribution of imports has changed over time and provides a dynamic view of Kazakhstan's trading partners from 2000-2012. It gives insight into which countries were gaining and which countries were losing importance in Kazakhstan's trade relations. Figure 3.3 clearly shows that Russia's exports to Kazakhstan were decreasing. The share of Russian imports to Kazakhstan decreased from 49% in 2000 to 38%, 37% and 34% in 2004, 2007 and 2012 respectively. In contrast, the export share of China increased significantly from 3% in 2000 to 6%, 11% and 27% in 2004, 2007 and 2012, respectively. Trade from the EU countries and other CIS countries did not change significantly: the EU percentage of imports was 24%, 28%, 25% and 20% in 2000, 2004, 2007 and 2012 respectively. The ECU share of imports decreased in the first year after the creation of the ECU in 2010 from 33 to 24%, almost doubled in 2011, to 42% and then decreased to 34% in 2012. China had the reverse situation, that is, the share of imports to Kazakhstan increased in 2010 when compared to 2009; it then decreased in 2011 from 17 % to 13% and again in 2012, it doubled from 13 to 27%.

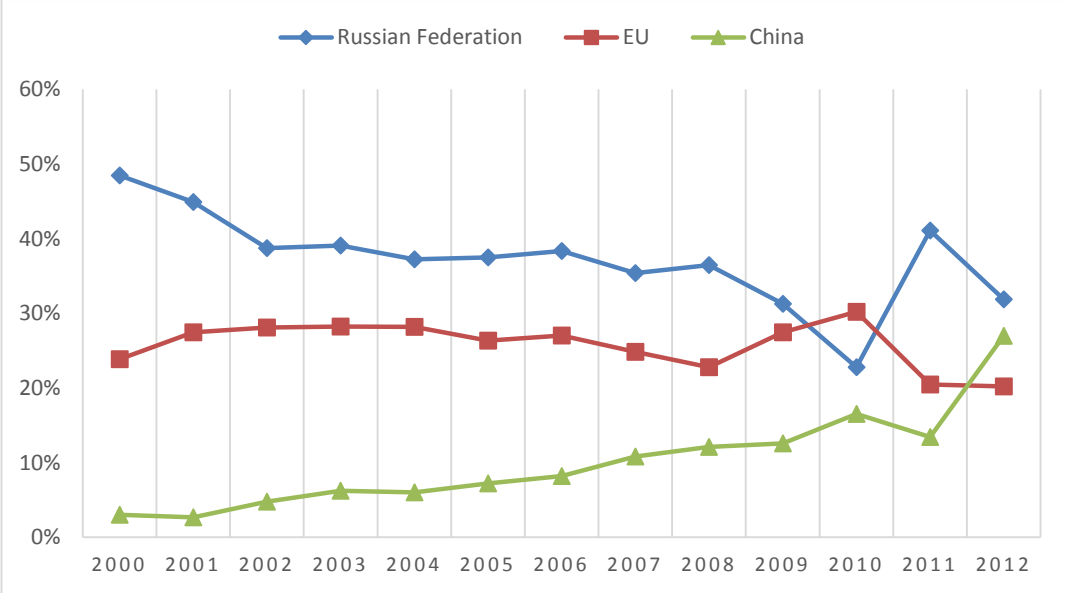


Figure 3.3 Import structure of Kazakhstan from 2000-2012

Source of data: International Monetary Fund (2015): Direction of Trade Statistics (Edition: Feb 2015)

In absolute figures, imports from China in 2012 increased almost two and half times in comparison with 2011. Total imports from China in 2012 were 12.1 USD bn, whereas in 2011 they were only 5 USD bn. A sharp increase in the CU import share in 2011 represents an increase from 5.7 USD bn to 15.9 USD bn; however, a sharp decrease in import share in 2012 was due to the enormous increase in imports from China, whereas imports from the ECU decreased only slightly from 15.9 to 15.2 USD bn.

The share of imports from the EU decreased from 30% to 20% in 2011 and stayed the same in 2012. In absolute figures, imports from the EU increased slightly, but the increase of imports from China and Russia resulted in a decreased share of the EU in overall imports. The situation was the same with other CIS countries: import figures were increasing slightly, but due to an increase in imports from China and CU they decreased from 10% in 2009 to 7% in 2012.

It might have been expected that the increase in the CET would lead to a decrease in imports from the EU and China; however, although the import share of the EU decreased, the absolute figures increased slightly after the ECU was established. Most unexpectedly, despite the rise of CET after establishment of the ECU, China's exports to Kazakhstan continued to grow and increased by almost 250% in 2012 (in 2012 year alone).

3.2.2. Intra CU trade

To see the overall trade effect of membership of the ECU, growth rates of ECU intra trade are compared to ECU trade with the CIS countries. In theory, intra-trade growth should be larger in the intra-CU export flows due to the abolition of customs controls, the adoption of the single system of phytosanitary norms and a single system of customs regulation and procedures, etc. However, the positive effect from the ECU on the intra-CU flows may take a couple of years to become statistically significant.

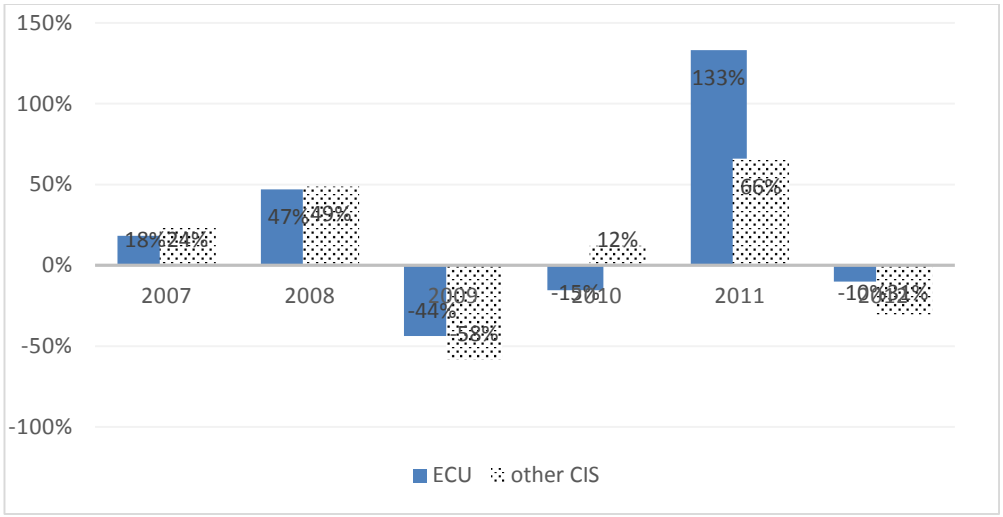


Figure 3.4 Comparison of Kazakhstan's growth rates of exports of CIS and ECU

Source of data: International Monetary Fund (2015): Direction of Trade Statistics (Edition: Feb 2015)

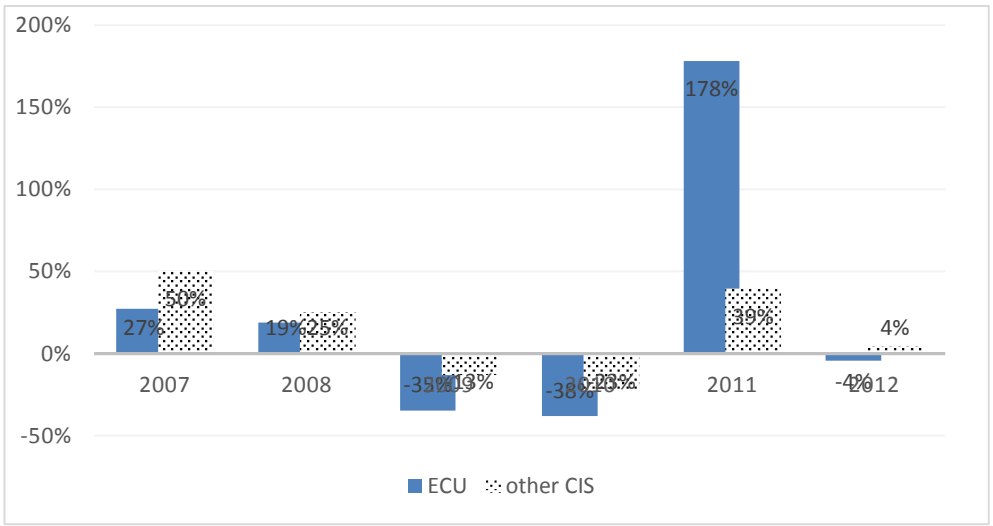


Figure 3.5 Comparison of Kazakhstani growth rates of imports of CIS and ECU

Source of data: International Monetary Fund (2015): Direction of Trade Statistics (Edition: Feb 2015)

Figures 3.4 and 3.5 above compare the growth rates of Kazakhstani trade with the ECU and CIS countries for the years 2007-2012. In 2010, by comparison with 2009, Kazakhstan exported 12% more to CIS countries and exports to ECU countries decreased by 15%. The same situation applies to imports, Kazakhstani imports from ECU countries decreased by 38%, whereas imports from CIS countries decreased by only 23% in 2010 when compared with 2009. The growth rate for both imports and exports of Kazakhstan to and from the ECU countries were significantly larger than trade flows to CIS countries: imports from the ECU grew 178% against CIS's 39% in 2011 in comparison with imports of 2010; exports grew 133% against 66% in 2011 in comparison with exports of 2009. In 2012 imports of Kazakhstan from CIS countries increased by 4%, whereas the level of imports to ECU countries decreased by 4%. Exports of Kazakhstani products to both ECU and other CIS countries decreased in 2012 in comparison with 2011. However the decrease of exports to other CIS countries was greater than the decrease of exports to the ECU: exports to other CIS countries decreased by 10% and exports to ECU countries decreased by 31%.

In conclusion, regarding the influence of the ECU on the trade of Kazakhstan, the impact of the common external tariff on imports of Kazakhstan seems to be less significant than expected as, even though tariff rates increased in 2010, imports from other countries still grew and, after the ECU establishment, the import share of China grew from 13% in 2009 to 27% in 2012. From the comparison of Kazakhstani trade with ECU and other CIS countries it can be seen that export growth rates of ECU countries was greater in 2011 and 2012. This might indicate that the decrease in NTB between ECU countries might have positively affected Kazakhstani export flows to ECU countries. The analysis import flows of Kazakhstan from the ECU and CIS does not give us a clear-cut picture. The growth rate of imports to ECU is much greater in 2011; however, the level of imports to ECU countries decreased in 2012, whereas the level of imports to other CIS countries increased during this year.

3.3. Theoretical Framework

3.3.1. Gravity Model

We use the gravity model to identify the impact of the changes in customs policy of Kazakhstan on its trade flows. The goal of gravity models is to determine the potential for the development of trade between countries. An economic application of the model was initially designed by Isard and Peck (1954) and Beckerman (1956), who suggested that trade patterns

have a strong correlation with geographical distance and that the income of a country has a significant positive correlation with trade volume between any of two countries. Linnemann (1966) included population as a possible explanatory variable, which was found to have a positive effect on bilateral trade. Berstrand (1989) extended the model further and added GDP per capita instead of population variable.

Table 3.1 Key points of the literature review

Authors	Model	Results
Anderson (1979)	Cobb-Douglas function	Constructed the gravity model with unit elasticity coefficients of GDP
Helpman and Krugman (1985)	Monopolistic competition model	Proved the relationship between market structure and trading volume; macroeconomic rationale of the gravity model
Bergstrand (1985, 1989)	Hekscher–Ohlin model	Made a comprehensive microeconomic model output, analysis of intra-industry trade
Deardoff (1995)	Based on Berstrand's work	Conducted a literature review on gravity model; constructed a bilateral trade equation for two limiting cases of the Heckscher-Ohlin theorem
Eaton and Kortum (2002); and Redding and Venables (2002)	New economic geography theory	Found a relationship between new economic geography theory and the gravity model
Anderson and van Wincoop (2003)	Constant elasticity of substitution	Made a comprehensive and well-reasoned conclusion of the gravity model
Helpman, Melitz and Rubinstein (2008)	based on Anderson's work	Constructed gravitational equation as a generalized equation of Anderson and van Wincoop

Anderson (1979) was the first to provide a theoretical justification for the gravity model within the context of a model using the Cobb Douglas production function, and he concluded

that regardless of the price, a country would consume at least one good from every country. He concluded that: "all goods are traded; all countries trade; and, in equilibrium, national income is the sum of home and foreign demand for the unique good that each country produces. For this reason, larger countries import and export more" (Anderson, 1979, p.111). Helpman and Krugman (1985) used the constant elasticity of substitution utility function to identify the relationship between the volume of trade and market structure. This finding implies the consistency of the gravity model with international trade theory. Furthermore, Deardoff (1995), Eaton and Kortum (2002) derived the gravity equation from the well-known Hekscher–Ohlin and Ricardian models, respectively. The key authors of theoretical justification of the gravity model are presented in table 3.1 above.

Until now, the gravity equation has mostly consisted of explaining observed trade flows by measuring the GDP of each partner, the distance between them, and an extendable list of additional determinants of the country or the bilateral level, which could have an impact on trade flows. "These flows have included various measures of cultural or historical ties between countries, factor endowments, production structures of each country, measures of the similarity or the complementarity of these between the two countries, barriers to trade, such as tariffs, non-tariff barriers, countries' levels of infrastructural development, and information systems" (Jarreau, 2011, p.13). The simple version of the gravity model is as follows:

$$log x_{ij} = a + \beta_1 \log(Y_i Y_j) + \beta_2 \log d_{ij} + \varepsilon_{ij} \quad (3.1)$$

where x_{ij} the value of is exports from i to j, Y_i and Y_j are the GDPs of countries i, and j, d_{ij} is the geographical distance between them, taken to be the distance between respective capital cities.

Depending on the objectives of the study and the availability of the necessary information, one can add to the distance other measures of trading costs such as language, infrastructure, common borders and import barriers. Also in line with the theoretical specification, it is also possible to add to a country's GDP other attractors that reflect expenditure in the country of destination and supply in the country of origin.

3.3.2 Dynamic gravity model

The static model discussed in section 3.3.1 assumes that the current trade between trading partners does not depend on the trade over the previous year. This is a strong assumption,

since it is very likely that the trade turnover between the two countries is a dynamic process in which the current level of trade has a certain degree of dependence on the previous level.

From a theoretical perspective, there are good economic reasons to believe that the actual bilateral trade flows are affected by lagged bilateral trade. Eichengreen and Irwin (1998) argued that the pattern of trade flow in the past affects the current trade flow, due to the sunk costs invested by exporters in the importing countries. In other words, when a company exports its products to its partner country, it also creates distribution and service networks in that country; thus, it is cheaper for the company to continue to export to the partner country rather than to a new country. The reason is that in order to enter the same market in the new country, it has to pay entry expenditures.

Another important reason is that consumers in the partner country are accustomed to the specific type of product - habit formation; that is if a customer is already using a particular product, they will be accustomed to that product. This suggests that the current level of bilateral trade will depend on the previous trade flows between the two partner countries (Eichengreen and Irwin 1998; Bun and Klaassen, 2002).

Moreover, trade events such as trade partnership and trade preferences, which led to CUs and free trade agreements, could cause a chain reaction on future trade flows (Krugman, 1993. Harris et al., 2008). There is also an empirical part of the proposal: Bun and Klaassen (2002) and De Benedictis Vicarelli (2005) have found that aggregate trade data have a strong persistence, and there is a tendency for countries that trade with each other at time t - 1 to trade at time t. Bun and Klaassen (2002) endorse this idea with the estimation of a dynamic panel model of gravity and acknowledge the important role of lagged trade in developing a dynamic model of gravity.

Furthermore, Zarzoso al. (2009) have reported that the results estimated using a dynamic gravity model are significant and robust in explaining RTAs. There are other options in developing a dynamic gravity model, for example, Bun and Klassen (2002) as well as Siah et al (2009) estimated the gravity model using the autoregressive distributed lag approach.

The effect of ‘lagged trade’ is important in order to estimate current and future trade correctly, and ignoring this dynamic element will result in error. Trade flows are intrinsically dynamic and it is important to draw measurable implications from the structural dynamic model of gravity.

3.4. Empirical Analysis

3.4.1 Model Specification and Variables Explanation

The analysis uses the simple gravity model structure to determine the effect of an increase of the average tariff for Kazakhstan and the impact of a decrease of non-tariff costs in ECU countries. The empirical strategy is to control as many "natural" causes of trade as possible, and to examine for the effects of changes of the tariffs in residual. Once other factors have been taken into account, it is anticipated that an increase in tariffs will reduce trade. The sample is not restricted only to countries of the particular Custom Union, but includes as many countries as possible so that the empirical analysis is based on the maximum information available.

The impact of an increase in external tariffs is considered using the gravity model structure. The goal of gravity models is to determine the potential for development of trade between countries. Thus, we will use the panel data set of observations for 13 years from 2000 to 2012 for ECU countries' (reporting countries) imports from 195 countries (trading partners). Sources of the data are presented in section 3.4.5. A group of ECU countries was chosen in order to create variability in data and because those countries have strong economic ties with Kazakhstan.

The specification of the estimated model tested is the following:

$$\log(\mathrm{IM}_{ij})_t = \mathrm{a}_o + \beta_1 \log \mathrm{D}_{ij} + \beta_2 \log(\mathrm{Y}_i \mathrm{Y}_j)_t + \beta_3 \log(\mathrm{Y}_i \mathrm{Y}_j / \mathrm{pop}_i \mathrm{pop}_j)_t + \beta_4 \log \mathrm{Area}_{jt} + \beta_5 \mathrm{Cont}_{ij} + \beta_6 \mathrm{COMECON}_{ij} + \beta_7 \mathrm{ComBOR}_{ij} + \beta_8 \mathrm{RER}_{ijt} + \beta_9 \mathrm{AvTar}_{ijt} + \varepsilon_{ijt} \qquad (3.2)$$

Where *i* and *j* denote trading partners, *t* denotes time, and the variables are defined as:

$\log(\mathrm{IM}_{ij})_t$ denotes the real[6] value of import trade between *i* and *j* at time *t*,

Y is real GDP[7],

Pop is population,

D is the distance between *i* and *j*, (between capitals of the countries)

Area is the area of the country (in square kilometres),

Cont is a binary variable which is unity if *i* and *j* share a land border

[6] Trade flows were deflated by national CPI.

[7] GDP was deflated by national CPI.

`COMECON[8] (The Council for Mutual Economic Assistance) is a binary variable, which is unity if the country is the member of the COMECON

RER[9] – real exchange rate between trading partners

ComBor is a binary variable, which is unity if *i* and *j* has common border,

ε_{ijt} represents the other influences omitted on bilateral trade

The variable AvTar represents an average tariff rate calculated by Jandosov and Sabyrova (2011), which was 6.45 for the years 2000-2010, 12.02 for the years 2010-2011 and 12.04 for 2012. Kazakhstan has a free trade agreement with the CIS countries, thus AvTariff for these countries is 0, and the calculation is explained in section 2.5. For Russia and Belarus we use tariff rates applied since the establishment of the ECU for all years: 0 for CIS countries and 12.04 for other countries.

This model can be transformed in the following dynamic representation:

$$\log(\mathrm{IM}_{ij})_t = \mathrm{a}_o + \beta_1 \log(\mathrm{IM}_{ij})_{t-1} + \beta_2 \log \mathrm{D}_{ij} + \beta_3 \log(\mathrm{Y}_i \mathrm{Y}_j)_t + \beta_4 \log(\mathrm{Y}_i \mathrm{Y}_j / \mathrm{pop}_i \mathrm{pop}_j)_t + \beta_5 \log \mathrm{Area}_{jt} + \beta_6 \mathrm{Cont}_{ij} + \beta_7 \mathrm{COMECON}_{ij} + \beta_8 \mathrm{ComBOR}_{ij} + \beta_9 \mathrm{RER}_{ijt} + \beta_{10} \mathrm{AvTar}_{ijt} + \varepsilon_{it} \quad (3.3)$$

GMM was chosen as the estimation method for this dynamic model. A discussion of the literature and selection of estimation method for the dynamic gravity model is discussed in section 3.4.2

The MG and PMG methods were used in estimating the long-run parameters of the gravity models of Kazakhstan's exports and imports to CIS countries. A discussion of the literature and selection of estimation method is discussed in section 3.4.3. We use the same gravity model as in the previous analysis; however, MG and PMG eliminates unobserved fixed effects through some transformations, so we cannot observe the effect of time invariant variables, such as the distance between trading partners, common border, COMECON and continent dummies. Whereas in the previous analysis, when we analysed the imports of Kazakhstan from all other countries (195 trading partners), all of these variables were theoretically important, in this model we analyse trade (thus, the dependent variables are exports and

[8] Eastern Bloc's reply to the formation of the Organization for European Economic Co-operation in Western Europe.

[9] Real exchange rate was found by multiplying the average annual nominal exchange rate of the reporting country by its CPI and dividing it by the average annual nominal exchange rate of the trading partner and CPI of the trading partner. $\mathrm{RER}=(\mathrm{NER}_i * \mathrm{CPI}_i)/\mathrm{NER}_j * \mathrm{CPI}_j)$.

imports) of Kazakhstan with CIS countries. As all of these countries are neighbours and the members of COMECON (as they were a part of Soviet Union), it is theoretically reasonable to expect that the inclusion of these variables tends to be less compelling.

The goal of the modelling is to compare trade flows of Kazakhstan with the CIS countries and the ECU countries. The CIS countries were chosen because these countries also have an FTA agreement with ECU countries, but not entered into the ECU (i.e. have not reduced non-tariff barriers). Basically, we want to the calculate the average treatment effect (decrease of non-tariff barriers, which occurred after 2010) by comparing the treatment group (ECU countries) and control group (other CIS countries) groups. We use the quarterly panel data set of observations for 13 years from 2000 to 2013 for Kazakhstan's (reporting country) trade flows to 7 of the CIS countries(data is only available for 7 of the 9 CIS countries, excluding Tajikistan and Azerbaijan). The specification of the estimated model tested is the following:

$$\log(\text{IM or EX}_{ij})_t = a_o + \beta_1 \log(Y_i Y_j)_t + \beta_2 \log\left(\text{pop}_i \text{pop}_j\right)_t + \beta_3 \text{RER}_{ijt} + \beta_4 \text{ECU}_t + \varepsilon_{ijt} \quad (3.4)$$

where i denotes Kazakhstan and j denotes the trading partners (CIS countries), t denotes time, and the variables are defined as:

$\text{Log(IM or EX}_{ij})_t$ denotes the real value of imports or exports between country i and country j at time t,

Y is real GDP,

Pop is population,

RER – real exchange rate between trading partners

ECU dummy is 1 if the trading partner is ECU country (for the years 2010-2013) and 0 if reporter is one of the other CIS countries.

ε_{ijt} represents the omitted other influences on bilateral trade.

3.4.2 Generalized method of moments (GMM)

The introduction of dynamics in a panel gravity model causes serious econometric problems due to the inconsistency of the estimators typically used in static panel data. The lagged dependent variable included on the right side of the equation will lead to the correlation between the lagged dependent variable and the error term. This correlation makes least squares estimates biased and inconsistent, and thus, the previously used OLS and Least Squares

Dummy Variable (LSDV) estimation methods should not be used in the dynamic model (Nickell, 1981, Hsiao, 1986).

The endogeneity problem in dynamic panel models has always been a major issue and an instrumental variable (IV) method is often used to deal with this problem. Nevertheless, the IV method can be used only if the instruments are good (they should be highly correlated with the potentially endogenous variables, and they should be exogenous to the model). It is practical, when possible, to have more instruments than endogenous variables, as it provides the possibility of testing for instrument exogeneity and omitting less efficient instruments.

Two commonly used methods in IV estimation are two least-squares (TSLS) and the generalized method of moments (GMM). The GMM method produces identical results in TSLS for just identified models, but can give a more accurate assessment for over-identified models. In addition, the GMM method uses internal instruments in contrast to the TSLS method, where the appropriate external instruments should be found.

The GMM method was proposed by Hansen (1982) and Holtz-Eakin et al (1988), and a particular development of interest is due to Arellano and Bond (1991, hereafter AB), commonly referred to as "the difference" GMM". AB (1991), derived a consistent estimator for the GMM model. They suggested that modifying the model into first differences removes unobserved fixed effects, and then it is estimated by a two-step GMM procedure. The second and higher lags of the endogenous variable in levels are appropriate choices of instruments. This AB estimator has two drawbacks as follows:

• The first difference equation removes fixed effects, thus if the variables of interest are time invariant, then difference GMM should not be applied;

• Blundell and Bond (1998) noted that: "the difference GMM estimator performs poorly in terms of precision, when it is applied to short panels (T dimension) with persistent time series. Lagged levels that have unit root properties are weak instruments for subsequent first differences" (Blundell and Bond, 1998). As bilateral trade flows between most of the countries are expected to change slowly, there is then a possibility that trade flows have a unit root and thus the lagged levels might not be appropriate instruments for subsequent first differences.

Based on the work of Arellano and Bover (1995), Blundell and Bond (1998) developed a systems estimator, which uses both first differences and levels of variables as instruments. Their method is termed as a system GMM estimator. It requires the panel level effects to be uncorrelated with the first difference in the first observation of the dependent variable and assumes that there is no autocorrelation in the idiosyncratic errors. The model adds a system of equations in levels to the equations in first differences. Thus, in the "system" GMM there

are twice as many observations as in the "difference" GMM (the first differences in the levels equation and levels in the first difference equation) and, therefore, the "system" GMM has greater efficiency in comparison with the "difference" GMM. The estimation results in Blundell and Bond (1998) have shown that the system GMM-estimator is more reliable than the difference GMM when one uses highly persistent data; however, in low persistence data both methods show very similar results. System GMM adjusts the instrument bias and allows the presence of time invariant explanatory variables.

Bearing in mind these considerations, we used system GMM estimation for the dynamic gravity model designed for panel data, which takes the following conditions into account:

- relatively few time periods, but a large number of country pairs;

- dynamics: lags of the dependent variable can be included as explanatory variables. The lagged dependent variable is instrumented by its lagged first differences, adds a system of equations where differenced lagged dependent variables are instrumented by their lagged levels; thus, this method uses the observations twice and treats both of the system of equations as one equation.

- independent variables which are not strictly exogenous[10]. They can be endogenous[11] or predetermined[12]. If an explanatory variable x_{it} is endogenous, then the instrument vector is $(y_{i1}, y_{i2},\ldots,y_{it-2})$; whereas if x_{it} is predetermined, then this vector would become $(y_{i1}, y_{i2},\ldots,y_{it-2}, x_{i1}, x_{i2},\ldots,x_{it-2}, x_{it-1})$; and in the case of exogeneity it would become $(y_{i1}, y_{i2},\ldots,y_{it-2}, x_{i1}, x_{i2},\ldots,x_{iT})$.

The GMM method was used for the dynamic gravity model shown by equation 3.3. One of the most important conditions in using the system GMM approach is that all the explanatory variables (the right-hand-side variables of the equation) should be weakly exogenous relative to the variable being explained (in our case current trade). As in bilateral trade flows, exports from country i to country j are part of country's i GDP and vice versa, therefore GDP as an explanatory variable can be correlated with the disturbance term and considered as endogenous. Lagged GDP is used as an internal instrument to avoid the endogeneity problem.

[10] "Exogenous explanatory variable is an explanatory variable that is uncorrelated with the error term." (Wooldridge 2013, p 842)

[11] "Endogenous explanatory variable is an explanatory variable in a multiple regression model that is correlated with the error term, either because of an omitted variable, measurement error, or simultaneity." (Wooldridge 2013, p 842)

[12] Predetermined explanatory variable is an explanatory variable that is correlated with the previous error term. (Wooldridge 2013, p 849)

The implementation of GMM used lags of order 3, as a serial correlation test for the regression analysis of the impact of the tariff rise in Kazakhstan, suggested 1st and 2nd order autocorrelation, but with no evidence of 3rd order autocorrelation. The literature on GMM estimation approach suggests (Roodman, 2009) that the model should use as many instrumental variables as possible as it provides the possibility of testing for instrument exogeneity and omitting less efficient instruments. However, in finite samples the large number of instruments created by GMM could lead to biased estimates as they could over-fit endogenous variables (Roodman, 2009). In the system GMM the number of instruments can be reduced by decreasing the number of moment conditions used. Usually the number of instruments is determined by 2 factors: the Hansen test and the number of panel members. According to Roodman (2009) one should not take comfort when Hansen test's p value below 0.1 and when the number of instruments exceeds the number of panel members.

Another important indicator that shows that results are unbiased is that the coefficient of the lagged dependent variable should fall within the range of OLS and fixed effects (FE) estimates. The OLS estimate of the lagged dependent variable is upward biased, as the lagged dependent variable is correlated with the unobserved fixed effect η_i in the equation $y_{it} = \alpha y_{it-1} + \eta_i + \varepsilon_{it}$ as$y_{it-1} = \alpha y_{it-2} + \eta_i + \varepsilon_{it-1}$. The FE estimate of the coefficient on the lagged dependent variable is downward biased as the lagged dependent variable and the transformed error term $\bar{\varepsilon}_i$ are correlated in the equation $y_{it} - \bar{y}_i = \alpha(y_{it} - \bar{y}_i) + (x_{it} - \bar{x}_i)\beta + (\varepsilon_{it-1} - \bar{\varepsilon}_i)$ as$y_{it-1} - \bar{y}_i = \alpha(y_{it-1} - \bar{y}_i) + (x_{it-1}t - \bar{x}_i)\beta + (\varepsilon_{it-1} - \bar{\varepsilon}_i)$.

The empirical strategy is to use as few instruments as possible with the estimated coefficient of the lagged dependent variable between coefficients of the lagged dependent variable estimated by FE and OLS; and with p value of Hansen test above 0.1.

Based on the three indicators mentioned above, we find that the best choice was to restrict the number of instruments to a maximum lag of 3. This is achieved through using the following instrumental variables: log of imports (3 lags); log of GDP (3 lags) and log of GDP per capita (3 lags). By using lagged trade and lagged GDP (3 lags) as instrumental variables, we avoid the endogeneity problem. Lagged GDP per capita (3 lags) is also used as an instrumental variable to capture the effect of lagged income on trade.

In order to account for any time series effects that are common across all countries in the sample, time dummies were included. According to Roodman (2009), one should remove time-related shocks from the errors by estimating the model with time dummies, which would make it more likely that resulting errors are not correlated across (only within) individuals.

3.4.3 Pooled mean group (PMG) and mean group (MG) estimators

The system GMM estimator will be used (see section 3.4.2) to analyse the potential impact of the increase of tariff rates in Kazakhstan (equation 3.3). However, in the analysis of the impact of the decrease in non-tariff barriers we cannot use GMM, as the instruments can be collectively invalid when the number of instruments is more than the number of panel members (Roodman, 2009), which is small in our case (only seven panel members). The distinctions between analyses of an increase in tariff rates and a decrease of non-tariff barriers are explained in sectioned 3.1. In addition, Pesaran et al. (1999) argued that the GMM estimation procedure for the dynamic panel model can produce inconsistent and misleading coefficients of the long-run coefficients when the time dimension of the panel is large; it is moderate in our case (T = 56); thus we have to use different method for analysis of non-tariff barriers.

In an analysis of the effect of the decrease of non-tariff barriers between ECU countries (equation 3.4), we are interested in analysing long-run relationships between the CIS and ECU countries. In order to model the non-tariff impact of the ECU on the trade of the CU, CIS countries trade flows are compared with ECU countries trade flows by inclusion of dummy variables for ECU countries (for the years 2010-2013). Country group analyses usually show some level of heterogeneity; however simultaneously share a good level of commonality that could potentially result in similar specifications and parameters. The standard technique involves estimating the averages of the parameters and is referred as the MG estimator. Pesaran and Smith (1995) show that the MG estimator provides consistent estimates of the parameters' real means. The main issue with this approach is that since the information conveyed in the panel dimension is not being exploited. The estimator will not be able to take into account that some of the parameters could actually be the same across units. This means that all parameters, intercepts, short-run coefficients, long-run coefficients and variances will be allowed to differ across groups, even when that is not the case, thus leading to a decrease in the efficiency of the estimator.

The second alternative (to MG) includes the panel data estimators, such as the fixed and random effect estimators, which allow intercepts to differ, but all the slopes are assumed to be identical across individuals. As discussed in Pesaran and Smith (1995), one of the main obstacles for this approach is that unless the slopes of the dynamic panel data model are in fact identical, these standard estimation procedures may produce inconsistent and possibly

very misleading estimates of the average values of the parameters. The aforementioned assumption, that slopes of the dynamic panel data model are identical, seems to be in most cases excessively strong. The identical short run dynamics and variances across groups are very hard to justify; however, the budget or solvency constraints and arbitrage conditions or common technologies, might be influencing a group of countries in a similar way. Thus, there is a good reason to assume that the long- run equilibrium might be similar in a group of countries.

Pesaran et al. (1999) introduced an alternative estimator where some degree of heterogeneity in the slopes is allowed, but a good level of long-run commonality is assumed, avoiding the very restrictive assumption of identical slopes and the potentially excessive generalization of totally unrelated parameters. Specifically, Pesaran et al., (1999) considered a model where intercepts, short-run coefficients and error variances are allowed to vary freely, but constrains the long-run coefficient to be the same across groups. This proposal is of particular interest in the analysis of CIS countries as it is possible that they might have similar long term dynamics due to the fact that they were one country before, have the same technological level and also have an FTA between each other. This being said, there is no strong reason to assume that in these countries the short-run dynamics and speed of convergence must coincide.

The model may be estimated with stationary and non-stationary regressors; however, if it is non-stationary it requires that regressors are generated by integrated processes of order 1. This requirement will be tested in the next sub-section. The empirical strategy is first test for unit roots and if some of the variables are non-stationary to test for cointegration and estimate the long-run parameters.

The presence of homogeneity of the long term estimates is very important. This can be tested by computing both the MG and PMG estimators and then performing a Hauman test. The pooled estimator estimates the long run parameters together and thus maximises the degrees of freedom. By contrast, the mean-group estimator estimates the parameters by cross sections and after that averages them across cross sections. When the slopes are homogenous, the pooled estimator is not efficient, whereas under the hypothesis of homogeneity it is efficient and consistent. The Hausman test can be set to find out whether the slopes are homogeneous using the fact that MG is always consistent. We determine whether PMG or MG is the preferred estimation method using a Hausman test. PMG is more efficient (minimum variance) under the null of heterogeneity but inconsistent (more N= more precise result) under the alternative. MG will be consistent under both, but inefficient under the null.

Thus, if the null hypothesis of the Hausman test is not rejected, the models are not significantly different; thus we can use the PMG, since it is efficient. If the null is rejected, they are significantly different, and we use MG. The calculated Hausman statistics for exports and imports shows that the PMG estimator, the efficient estimator under the null hypothesis for both exports and imports, is preferred.

The PMG estimator offers a new technique for estimating dynamic heterogeneous panels, and it relies on a combination of pooling and averaging of coefficients across groups (Blackburne and Frank, 2007). The model is an autoregressive distributed lag (ARDL) (p, 1,…, k) dynamic panel specification of the general form

$$y_{it} = \sum_{j=1}^{p} \lambda_{ij} y_{it-1} + \sum_{j=1}^{q} \delta'_{ij} X_{it-j} + \mu_i + \varepsilon_{it} \qquad (3.5)$$

Where i indexes the countries i = 1, 2,…,N; and t indexes the number of periods t = 1, 2,…,T; X_{it} is a kx1 vector of explanatory variables (GDP, population, real exchange rate and ECU dummy); δ'_{ij} are the kx1 coefficient vectors; λ_i are scalars; and is μi the group-specific effect.

An important feature of the cointegrated variables is their responsiveness to any deviation from the long-run equilibrium. As such, the PMG estimator provides a useful a way of capturing the short-run dynamics of the variables in the system by estimating an error correction equation form of the ARDL specification in (3.5):

$$\Delta y_{it} = \phi_i (y_{it-1} - \theta'_i X_{it-1}) + \sum_{j=1}^{p-1} \lambda^*_{ij} y_{it-1} + \sum_{j=1}^{q-1} \delta'^*_{ij} X_{it-j} + \mu_i + \varepsilon_{it} \qquad (3.6)$$

The parameter ϕ_i is the error-correcting speed of adjustment term for the i-th country. Under the assumption that the variables return to a long-run equilibrium ϕ_i is expected to be significantly negative. The vector θ'_i, which contains the long-run coefficients between the variables and δ'^*_{ij} incorporates the short-run relationships. Blackburne and Frank (2007) develop a maximum likelihood method to estimate the parameters through an iterative process until convergence is achieved.

3.4.4 Panel unit root and cointegration tests

The underlying assumption of PMG models is that regressors are following integrated processes of orders 0 and/or 1. In order to check that our data satisfies this assumption we need to perform panel unit root and cointegration tests on all variables.

As a prerequisite for panel cointegration tests, we ascertain the stationarity or integration properties of the time variant variables that enter the gravity model, namely, GDP (lnRY), GDP per capita (lnRYpc), exports (lnREX), imports (lnRIM) and the bilateral exchange rate (RER). This is achieved by employing the Levin, Lin and Chu (LLC) and Im, Pesaran and Shin (IPS) panel unit root tests on the variables over the period 2000Q1-2013Q4. Panel unit root testing requires analysing the stationarity properties of the variables as it is believed that most macroeconomic variables exhibit trends that may be stochastic. The LLC test developed by Levin et al. (2002) is a generalization of the augment Dickey-Fuller (ADF) individual country unit root test to a common panel unit root test. The idea is that this panel unit root will be more powerful than performing individual unit root tests for each cross-section. The LLC test evaluates whether the each time series are stationary with H_0 that they are non-stationary and H_a that all time series in the panel are stationary. The resulting panel version of the ADF test takes the following form:

$$\Delta y_{it} = \sigma_i y_{it-1} + \sum_{j=1}^{pi} \theta_{ij} \Delta y_{it-j} + \emptyset_i Z_{it} + \varepsilon_{it} \qquad (3.7)$$

The σ is referred to as sigma which is equal to ρ – 1, .where ρ is the autoregressive (AR) coefficient; Z_{it} is the vector of deterministic variables including fixed effects or joint intercept, linear time trends and time dummies which capture cross-sectional heterogeneity and $\emptyset_i$ is the corresponding vector of coefficients. As the ρ_i , the lag length of the lagged difference is unknown, LLC (2002) suggest the three-step procedure to implement their test[13]:

(i) Perform augmented Dickey Fuller (ADF) regression for each cross-section and generate two sets of orthogonalized residuals;

(ii) For each individual estimate the ratio of long-run to short-run standard deviations;

(iii) Compute the pooled t-statistics, with the average number of observations per individual in the panel and average lag length of individual ADF regression.

[13] See Baltagi (2008) for detailed discussion on this test and derivation of the test statistic.

The null hypothesis of the LLC test assumes all cross-sections are non-stationary (H_0: $\sigma = 0$) since the AR coefficient ρ is restricted to be the same across individuals (i.e.$\rho_i = \rho$ for all i). The alternative hypothesis is that each time series is stationary (H_a: σ<0 for all individual units i). The pooled t-statistic has been shown by the LLC to have a limiting normal distribution as N→ ∞ and T → ∞ and is recommended for panels of moderate size. The performance of the LLC test may have poor power and be problematic for panels with small time dimension (i.e. when T is small), in our case we have a moderate T (T=56).

It is required by the LLC test that ρ be homogeneous across I (i.e.$\rho_i = \rho$ for all i). Im et al. (2003) proposed a heterogeneous panel unit root test (IPS test), which address this homogeneity issue. This test is based on individual ADF tests. They allow for a heterogeneous coefficient of y_{it-1} and proposes an alternative testing procedure based on averaging ADF individual unit root test statistics, which can be normalized to have a normal distribution. The null hypothesis is that each series in the panel contains a unit root, (H0: ρi = 0 for all i) and the alternative hypothesis allows for some of the individual series to have unit roots (H0: ρi<0 for at least one i). The IPS t-bar statistic is defined as the average of the individual ADF statistic as follows:

$$\bar{t} = \frac{1}{N}\sum_{i=1}^{N} t_{\rho_i} \qquad (3.8)$$

where t_{pi} is the individual t-statistic for testing the null hypothesis. IPS show that a properly standardized, $\bar{t}$ has an asymptotic N (0, 1) distribution, given as:

$$t_{IPS} = \frac{\sqrt{N}(\bar{t} - \frac{1}{N}\sum_{i=1}^{N} E[t_{iT}|\rho_i=0])}{\sqrt{\frac{1}{N}\sum_{i=1}^{N} var[t_{iT}|\rho_i=0]}} \qquad (3.9)$$

as N→ ∞ followed by T → ∞ sequentially. IPS test have a better performance than LLC test in the small samples, when the large lag order is chosen for ADF regressions (Baltagi, 2008).

Table 3.2 Panel unit root test results

Variables	LLC	LLC	IPS	IPS
	Level	Level	Level	Level
	Constant	Constant + Trend	Constant	Constant + Trend
Exports (natural log)	-2.8701***	-2.6023***	-2.5806***	-2.2431**
Imports (natural log)	-3.7546***	-3.5874***	-1.7910**	-0.8804
Countries' GDP (natural log)	-3.6134***	-7.0870***	-1.6020*	-6.9853***
Countries' GDP per capita (natural log)	-3.8675***	-6.9317***	-1.9759**	-6.6793***
Exchange rate	1.7871	4.9261	-0.554	-0.7175
Variables	**LLC**	**LLC**	**IPS**	**IPS**
	First difference	**First difference**	**First difference**	**First Difference**
	Constant	**Constant + Trend**	**Constant**	**Constant + Trend**
Exports (natural log)	-17.3059***	-16.6365***	-17.1224***	-16.3492***
Imports (natural log)	-26.0307***	-26.0144***	-24.9106***	-25.1253***
Countries' GDP (natural log)	-33.4492***	-32.9161***	-32.5659***	-33.1900***
Countries' GDP per capita (natural log)	-33.0948***	-32.5927 ***	-32.2845***	-32.9275***
Exchange rate	-31.0326***	-19.6132***	-24.0911***	-18.3851***

(1)*** denotes significance at the 1% level; **, at the 5% level; and *, at the 10% level.
(2)The test statistics were computed with the aid of Eviews8

To sum up, whereas the LLC test relies on the common unit root process assumption that the autocorrelation coefficients (ρ_i) of the tested variables throughout all cross sections are identical, (indicating an alternative hypothesis of stationarity in all panel units), the IPS test is based on the individual unit root process assumption that the autocorrelation coefficients vary throughout cross sections. The test results are presented in Table 3.2 above. Individual intercepts; and individual intercepts plus deterministic time trend were included in all the test specifications. To determine the country-specific lag length for the ADF regressions, the Schwarz-Bayesian Information Criterion (BIC) was used for the LLC and the IPS tests. It was decided to show tests with and without trend, as for some of the variables (GDP, per cap GDP and the exchange rate) it is necessary to do the test with trends.

The results of the LLC panel unit root test show that some of the variables are non-stationary in the levels. With or without the inclusion of a deterministic trend, the LLC and IPS tests suggest that whereas GDP (lnRY), GDP per capita (lnRYpc), exports (lnREX), achieved stationarity in their levels, bilateral exchange rates (RER) are non-stationary, indicating the presence of unit root in the variables. In addition the IPS test shows that variable bilateral imports (lnRIM) have a unit root when we include a deterministic trend in the test.

In addition, Table 3.2 shows the results of the LLC and IPS tests for unit root after first differencing the data series, whilst allowing for individual effects (constant) and individual effects plus a deterministic time trend. In the first case, when we allowed for only individual effects, both LLC and IPS tests respectively rejected the null hypothesis of common unit root and individual root in all panel data series at 1 percent significance level. Intuitively, this suggests that, on the basis of LLC and IPS tests, there is very strong evidence lnRIM and RER variables are integrated of order one, i.e. I(1).

The overall conclusion drawn from the results of the LLC and IPS panel unit root tests is that there is mixed evidence of non-stationarity in some of the variables that are time variant. Most of the variables are stationary at the level (and are therefore I (0)). The implication of these results is that estimating the specified gravity model using the OLS estimator will yield biased and inconsistent estimates. It is therefore, imperative to determine the existence of the stable long-run (cointegrating) relationship between the variables. Specifically, the variables are said to be cointegrated if a linear combination of the variables turns out stationary error terms.

We employ Pedroni's residual-based test to assess the null hypothesis of no cointegration among the variables. Balgati (2008) noted: "that panel cointegration models are directed at studying questions that concern long-run economic relationships typically encountered in macroeconomic and financial data. Such a long-run relationship is often predicted by economic theory and it is then of central interest to estimate the regression coefficients and test whether they satisfy theoretical restrictions" (Baltagi, 2008, p.232). Pedroni's test has been employed here to assess the cointegrating properties among the time-variant variables entering the estimable gravity model.

Following Pedroni (1999), we consider the following model:

$$Y_{it} = \alpha_i + \beta_{it} + \gamma_{1i}x_{1i} + \gamma_{2i}x_{2i} + \gamma_{3i}x_{3i} + \cdots + \gamma_{Mi}x_{Mi} + \varepsilon_{it} \qquad (3.10)$$

For i = 1, 2, …,N cross-sections; t = 1, 2, …, T observations over time; and m = 1, 2, …, M regressors (xs); and $e_{it} = p_i e_{it-1} + \varepsilon_{it}$.

In the above equation, α_i represents the individual-specific (fixed) effect intercept that is allowed to differ across individual cross-sectional units; β_{it} is the time effect modelled heterogeneously in the same way as the α_i and γ_{1i}i,$\gamma\ \gamma_{2i}$, γ_{3i}i… γ_{Mi} are the slope coefficients. In our context there are only two I(1) variables, which are the log of real imports and the real exchange rate.

In Pedroni's cointegration tests the value the AR(1) coefficient (ρ_i) is tested for the presence of unit root as in the Engle-Granger (1987) two-step approach to cointegration in time series analysis. Pedroni developed two main types of test statistics, namely within-group test statistic (which assumes homogeneity of the AR term) and between-group test statistic (which allows for heterogeneity). Pedroni tested the null hypothesis of no cointegration through seven panel cointegration test statistics using the residuals from the long-run regression. Four of them are pooled statistics (based on the within dimension approach), also referred to as panel test statistics. The remaining three are group cointegration tests (based on the between-dimension); they are less restrictive as they allow for heterogeneity of the AR term.

The first statistic (v-statistic) is equivalent to the long-run non-parametric variance ratio statistic, while the second statistic (panel ρ statistic) is analogous to the Phillips and Perron's (1988) semi-parametric 'rho' statistic. Two other test statistics are panel extensions of the Phillips-Perron (non-parametric) and ADF t-statistics (parametric), respectively. These tests are valid only with I(1) variables and allow for heterogeneous fixed effects, individual deterministic tests and slope coefficients. Fidrmuc (2009) noted that: "these tests are based on the null hypothesis of no cointegration,H_0: $\rho_i = 1$, against the homogenous alternative H_a: $\rho_i = \rho < 1$ for all panel units i. The parametric statistics use the fully specified panel ADF, while the non-parametric statistics do not include lagged differenced residuals" (Fidrmuc, 2009).

Finally, it was written by Fidrmuc (2009) noted that: "the group mean statistics are defined similarly for heterogeneous group mean estimates (i.e., average of parameter estimations for the separate units). In this case, the alternative hypothesis is, HA: ρi < 1 for all i, which may be preferable for standard empirical applications" (Fidrmuc, 2009, p.32).

Table 3.3 below reports the results of the test for the existence of a long-run stable relationship among the all I(1) variables, (log of real imports and real exchange rate) as

proposed by Pedroni. The seven tests for null hypothesis of no cointegration in a panel data model, as developed by Pedroni, are presented in the Table. These tests are classified into two categories – panel statistics consisting of the first four tests, and group panel statistics, constituted by the last three statistics.

Table 3.3 Panel cointegration test results

Pedroni's Panel Statistics	**Cointegration test for Log of Imports (lnRIM) and real exchange rate (RER)**	
intercept +trend	**Statistic**	**p-value**
Panel v-Statistic	2.45	0.01
Panel rho-Statistic	-7.26	0.00
Panel PP-Statistic	-7.15	0.00
Panel ADF-Statistic	-9.13	0.00
Group rho-Statistic	-5.07	0.00
Group PP-Statistic	-9.33	0.00
Group ADF-Statistic	-11.23	0.00
intercept	**ADF t-Statistic**	**p-value**
Panel v-Statistic	-0.13	0.55
Panel rho-Statistic	-2.63	0.00
Panel PP-Statistic	-2.46	0.01
Panel ADF-Statistic	-1.91	0.03
Group rho-Statistic	-2.25	0.01
Group PP-Statistic	-2.40	0.01
Group ADF-Statistic	-1.96	0.02

The test statistics were computed with the aid of Eviews 8

In group statistics the first-order autoregressive term can vary throughout all cross sections, whereas the panel statistics are assumed to be the same throughout the cross sections. The gravity model have cointegration of variables for at least one of trading partners if the group tests' null hypothesis is rejected, and there is a cointegration for all trading partners if the null hypothesis is rejected by panel statistic.

From Table 3.3 above it is clear that three (i.e. panel rho statistic, panel Philips-Perron (PP)- and augmented Dickey-Fuller (ADF)-statistics) out of the four panel statistics, strongly rejected the null hypothesis of no cointegration among the variables at 1% significance level, considering the logarithms of imports and exports as dependent variables. On the other hand, two (i.e. group PP- and ADF-statistics) out of the three group panel statistics, strongly rejected the null hypothesis at 1% level of significance for both total imports and exports models. In addition group rho statistics strongly rejected the null hypothesis of no cointegration for imports. Thus, out of the seven test statistics, at least five statistics (for imports six of seven) strongly rejected the null hypothesis, in favour of the alternate hypothesis of panel cointegration among the variables. We can conclude that there is a cointegration between variables and we can use PMG to analyse the effect of ECU on trade flows of Kazakhstan.

3.4.5. Data

This section describes data used in analysis of the impact of the ECU on the trade of Kazakhstan. For a description of the variables and sources from which data is obtained please see Table 3.4. This chapter uses panel data for both analyses. The analysis for detecting the impact of the tariff rise in Kazakhstan uses the annual panel data set of observations for 13 years from 2000 to 2012 for ECU countries' imports from 195 countries (see table 3.5 for descriptive statistics).

The analysis for detecting the impact of the decrease of non-tariff barriers in Kazakhstan uses the quarterly panel data set of observations for 13 years from 2000 to 2013 for Kazakhstan's trade flows (imports and exports) to 7 CIS countries (see appendix A, tables A.1 and A.2 for descriptive statistics)

Table 3.4 Sources of data

Variable	Source
Annual and quarterly gross trade values (exports and imports)	Direction of trade data set from International Monetary Fund (IMF) (http://www.esds.ac.uk/international/support/user_guides/imf/dots.asp) for bilateral merchandise trade (between 204 IMF, including countries of Custom Union, trading entities between 2000 and 2012)
Annual Gross GDP of a reporter country and trading partner country	The World Bank's World Development Indicators, and the IMF's International Financial Statistics for gross GDP data (in constant American dollars). (http://data.worldbank.org/data-catalog/GDP-ranking-table and http://data.worldbank.org/indicator/NY.GDP.MKTP.CD)
Population of a reporter country and trading partner country	The World Bank's World Development Indicators. (http://data.worldbank.org/indicator/SP.POP.TOTL)
Distance between trading partners	Centre d'Etudes Prospective et d'Informations Internationales (**CEPII**) for distance between countries (http://www.cepii.fr/anglaisgraph/bdd/distances.htm)
Area of a reporter country and trading partner country	Centre d'Etudes Prospectives et d'Informations Internationales (**CEPII**) for countries area (http://www.cepii.fr/anglaisgraph/bdd/distances.htm)
Annual average exchange rate	The World Bank's World Development Indicators. (http://data.worldbank.org/indicator/PA.NUS.FCRF)
Common border	Centre d'Etudes Prospectives et d'Informations Internationales (**CEPII**) for Contiguity (http://www.cepii.fr/anglaisgraph/bdd/distances.htm)
CPI (Consumer Price Index) deflator	The World Bank's World Development Indicators. (http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG)
Average tariff rates before and after establishment of ECU	This study uses average tariff rates calculated by Jandosov and Sabyrova (2011). The following simple mean applied AVE tariff rates were used in regressions: post CU period – 6.45, after CU period – 12.02, 12.02, 12.04, 12.12 and 12.24 for 2010, 2011, 2012, 2013 and 2014 respectively. For more detailed explanation on a method used in calculation of simple mean tariff rates see section 2.2.
Quarterly data on CIS countries' GDP, Exchange rates and CPI	Statistical Database of United Nations Economic Commission for Europe (http://w3.unece.org/)

3.4.6 Regression Results

The results of the static gravity model are presented in Table 3.5 below. The GDP coefficient as expected has a positive sign; the coefficient of GDP per capita has a negative sign, which supports with Linneman's view (1966) that the difference in living standards (proxied by GDP per capita) between trading countries is negatively correlated with population. Since the standards of living are determined in part by factor endowments, Linneman argued that capital abundant countries tend to be richer than labour abundant countries. Thus, there should be a considerable volume of trade between countries with similar characteristics and less between those with different characteristics. Implicitly, medium level

countries like Kazakhstan should trade with other medium level countries and less with wealthy countries. Thus, the larger the GDP per capita of a trading country, the less it will trade with Kazakhstan. Distance has a strongly negative and significant coefficient, which confirms its role as distance represents a natural resistance to trade (Linneman, 1966 and Rose, 2002).

Table 3.5 Regression results from OLS (without introducing country specific effects)

Dependent variable	**log IM**
Countries' real GDP (natural log)	1.345***
Countries' real GDP per capita (natural log)	-0.0543
Real Exchange rate	0.0000727
Area of the trading partner	-0.00142
Area of the reporting partner	-0.345***
Distance (natural log)	-0.492***
Border	1.053***
Continent dummy	0.801***
COMECON dummy	2.556***
Average tariff rate	**-0.117*** **
Constant	-33.63***
Observations	6028
R^2	0.667

(1) *** denotes significance at the 1% level; **, at the 5% level; and *, at the 10% level.
(2) Time specific effects are included in regression results.
(3) The estimated model is detailed in equation 3.2

The common border had a positive and significant coefficient, which means that on average the sharing of a common border increases trade flows between two countries. Continent and COMECON dummies also have strongly positive coefficients. The key coefficient of first column shows how changes in tariffs influence imports outside of the ECU. The coefficient of average tariff rates is -0.117 and significant at the 1% level. The CET is a dummy variable which is 6.45 before and 12.04 after the establishment of the ECU for non CIS countries; and 0 for CIS countries. Thus, as the dependent variable is the log, the effect of the coefficient of this dummy is measured as a percentage change of

dependent variable (import) due to a unit increase, which is measured in percent (from 0 to 12.04), of the independent variable (CET rate). We have a log-linear model as our dependent variable which is in natural logarithm form; and the dependent variable is continuous regressor; thus the change in tariffs will be scaled by exponent of average tariff rate coefficient. Hence the effect of a tariff increase is estimated to be a 12.4% [100*(e0.117-1)=12.4%] decrease in import flows to Kazakhstan if the average external tariff rate of Kazakhstan increases on 1 percentage point (e.g. from 7% to 8%).

Table 3.6 below demonstrates that, if country fixed effects are introduced by creating a dummy for every country pair, the coefficient of the average tariff rate decreases from 12.4% to 8.5% [100*(e0.082-1)=12.4%], but both the sign and significance stay the same.

Table 3.6 Regression results from OLS with country specific effects

Dependent variable	**log IM**
Countries' GDP (natural log)	2.129***
Countries' GDP per capita (natural log)	0.115
Real exchange rate	-0.0000289
Area of the reporting country	-0.955
Area of the partner country	-0.446**
Distance (natural log)	0.408
Border	3.861***
Continent dummy	-10.37**
COMECON dummy	9.547***
Average tariff rate	**-0.0823*** **
Constant	-42.80***
Observations	6028
R^2	0.902

(1) *** denotes significance at the 1% level; **, at the 5% level; and *, at the 10% level.

(2) Time specific effects are included in regression results.

(3) The estimated model is detailed in equation 3.2

Table 3.7 below shows the results of the dynamic gravity model, discussed in section 3.4.3. We begin the interpretation of the results in this table by examining some specification or diagnostic tests.

First of all, the serial correlation test for the regression analysis of the impact of the tariff rise in Kazakhstan, suggests 1st and 2nd order autocorrelation, but no evidence of 3rd order autocorrelation; hence 3nd order lags are used here.

Secondly, the Hansen J-statistic tests the null hypothesis of correct model specification and over-identifying restrictions. A rejection of the null hypothesis indicates that either or both the correct model specification and over-identifying restrictions are questionable. Roodman (2009) suggested that p-value of Hansen J statistic should be larger than 0.1. The GMM model clearly passes the Hansen test of the over-identifying restrictions using the Roodman suggestion as the p value of this test is 0.192. This suggests that the empirical analysis has valid instruments, as the null hypothesis was not rejected.

Thirdly, the system GMM can be biased if it has a large number of instruments because they can be collectively invalid in finite samples and thus over-fit endogenous variables[14]. Roodman (2009) suggests that the number of instruments should not exceed the number of panel members, which is adhered to in our case (139 instruments < 511 panel members for both analyses).

Estimation of the dynamic gravity model shows that current trade is affected by lagged trade. The lagged dependent variable has a large positive coefficient (0.779), which is highly significant (at the 1% level of significance), suggesting that trade volumes last year have a positive significant impact on current trade. This supports the theoretical assumption that current trade is influenced by lagged trade mentioned in section 3.2.3. The coefficients of the lagged dependent variable estimated by GMM are within the range of its OLS and FE estimates. The results of GMM estimation suggests that coefficient of average tariff rate is significant (at the 10% significance level) and negative (-0.03), implying that the increase in tariff rates reduced Kazakhstan's imports. Hence, the effect of tariff increase is given by [100*(e0.03-1)=3%] decrease in imports if the average external tariff rate of Kazakhstan increase on 1 percentage point increase (e.g. from 7% to 8%).

[14] 'For intuition, consider that in 2SLS, if the number of instruments equals the number of observations, the Rsquared of the first-stage regressions are 1, and the second-stage results match those of (biased) OLS. This bias is present in all IV regressions and becomes more pronounced as the instrument count rises. (Roodman, 2009,p 99)

Table 3.7 Regression results of GMM estimation

Dependent variable	log IM
Lag of dependent variable (natural log)	0.779***
Second lag of dependent variable (natural log)	0.095
Countries' GDP (natural log)	0.333**
Countries' GDP per capita (natural log)	-0.158**
Exchange rate	0.0000109
Area of the trading partner	-0.0913*
Distance (natural log)	-0.0841*
Border	0.0626
Continent dummy	-0.0219
COMECON dummy	0.230*
Average tariff rate	**-0.0300***
Constant	-6.643**
Observations	4595
Number of groups	511
Number of instruments	126
Hansen test of overriding restrictions(p-value)	0.192
Arellano-Bond test for autocorrelation of 1 order (p-value)	0
Arellano-Bond test for autocorrelation of 2 order (p-value)	0.012
Arellano-Bond test for autocorrelation of 3 order (p-value)	0.567
Does coefficient of lagged dependent variable fall within the range of its OLS and fixed effects (FE) estimates?	Yes

(1) *** denotes significance at the 1% level; **, at the 5% level; and *, at the 10% level.

(2) Time specific effects are included in regression model.

(3) The estimated model is detailed in equation 3.3

The results of the analysis on the impact of non-tariff barriers reduction are presented in Table 3.8 below. The PMG estimator is a panel extension of the single equation ARDL model with an error correction representation, which enables estimation of the long-run coefficients whilst providing information about the short-run behaviour. All long-run coefficients of the baseline gravity variables are found to have the same sign as in the previous analysis (Tables 3.7-3.9). In particular, the results of PMG estimates confirm that real GDP has a positive and

significant impact on imports and exports and that population exerts significantly negative impact on both bilateral trade flows.

Table 3.8 Results of model, estimation using PMG

Long run coefficients	**Exports**	**Imports**
Countries' real GDP (natural log)	0.366***	0.429***
Countries' population (natural log)	-7.721***	-0.297
Real Exchange rate	0.0228**	-0.0155**
ECU time dummy	**0.485*** **	**-0.0236**
Speed of adjustment	**-0.235*** **	**-0.338*** **
Short run coefficients		
Countries' real GDP (natural log)	0.180*	0.106***
Countries' population (natural log)	-1.322	-5.296***
Real Exchange rate	0.201	0.35
ECU time dummy	-0.0187	0.0188
Constant	60.25***	2.461***
Observations	392	392

(1) *** denotes significance at the 1% level; **, at the 5% level; and *, at the 10% level.

(2) The procedure follows an autoregressive distributed lag, please see section 3.4.3 for details

(3) The estimated model is detailed in equation 3.4

As expected, the long run effect of a depreciation of the external value of the Kazakhstani tenge (KZT) is found to have a significant positive effect in the export equation, but a significantly negative effect in the imports equation. The real bilateral exchange rate is incorporated as a proxy for the relative price of foreign goods in terms of domestic goods, and proxies the international competitiveness of goods produced domestically. An increase in the real exchange (or currency depreciation) means that it takes fewer units of foreign currency to buy one unit of domestic currency. This makes domestic goods relatively cheaper, leading to an increase in exports due to higher foreign demand. On the other hand, when the real exchange rate decreases (i.e. a currency appreciation) an economy loses competiveness because it now requires more units of foreign currency to buy one unit of domestic currency. The regression results show that the impact of the exchange rate is approximately 2% for both imports and exports. This occurs because Kazakhstan had a managed float currency regime, as the central bank of Kazakhstan fixed the KZT to USD ratio, but allowed for a wide currency

corridor. The regression catches the effect of the exchange rate variation within this corridor on the trade flows of Kazakhstan.

Turning to the short-run impacts of the variables the estimation results also provide information about the speed of convergence to the long-run equilibrium (steady state) following a short-run shock in the system. From the short-run results, a boost in domestic economic activity (countries' GDP) is found to positively affect total bilateral trade whilst reducing the country's exports supply, probably due to a high domestic absorption effect. The short-run coefficient on population in the imports equation has a significant negative sign. The real bilateral exchange rate does not have a significant effect in either the exports or imports equation, in the short run. The short run customs union dummy is unexpectedly negative for both imports and exports, although it is statistically insignificant.

The speed of adjustment estimates from each model imply almost the same short-run dynamics for both the exports and imports models -0.235 and -0.338 respectively. Both coefficients are signed correctly (negative) and statistically significant at 1 percent level, guaranteeing convergence to equilibrium in the long-run following a sudden shock in the short-run. Intuitively, the coefficients of the ECM suggest that following a deviation from the long-run in the previous period, adjustment to the long-run steady state is corrected by 23% and 34 % in the current year in the imports and exports gravity models, respectively.

Of primary interest to the analysis in this section, and the focus of this chapter, are the estimated coefficients of the long run customs union dummy. The key coefficient for exports of Kazakhstan is estimated to be [100*(e0.485-1)=62%] and is statistically significant (at a 1% significance level). The custom union is estimated to increase exports of Kazakhstan to the ECU countries by about 62% due to the decease of the non-tariff barriers between the ECU countries. The estimated coefficient of the ECU dummy for imports is negative, but not statistically significant. This suggests that the decrease in non-tariff barriers has positively contributed to the exports of Kazakhstan to the ECU countries, but has not had an impact on imports from these countries.

3.5. CONCLUDING REMARKS

The benefits and costs of a CU between Kazakhstan, Russia and Belarus is one of the most debated issues in the CIS area. The participants emphasise that this is an open integration project which welcomes any willing CIS country, and the theoretical and empirical literature

indicates that there are two major factors that can influence the trade flows in relation to the establishment of ECU.

The first is the impact of new common external tariff rates on Kazakhstan's import. Mkrtchyan and Gnutzmann (2012) have analysed data on tariffs and find that Russia and Belarus had similar tariff averages prior to the ECU, while Kazakhstan had a noticeably lower tariff average.

The second factor is the impact of decreasing non-tariff barriers. In 2010 internal border controls were removed and the ECU determined rules regarding sanitary and phyto-sanitary standards to be applied within the ECU.

This chapter has assessed how these two factors have affected the trade levels of the ECU countries, with the effect considered in a framework that controls for country fixed effects using the OLS, GMM and PMG estimation method of a gravity model. The effect of tariff increase, using the preferred dynamic gravity model, is estimated to be a 3% decrease in imports if the average external tariff rate of Kazakhstan increase on 1 percentage point increase (e.g. from 7% to 8%). As a result, the estimated decrease in imports of Kazakhstan, due to the increase in the tariff rates, is approximately 16.7% (3% multiplied by the change in average tariff rate from 6.45% to 12.02%). However, the accession of Russia to the WTO might lead to a decrease in tariff rates of the ECU. Shepotylo and Tarr (2012) calculated that after Russia implements all commitments to the WTO, average un-weighted tariff rates of ECU will decrease from 13 to 5.8%. The custom union is estimated to increase exports of Kazakhstan to the ECU countries by about 62% due to the decease of the non-tariff barriers between the ECU countries; whereas the effect of the decrease of non-tariff barriers on imports of the ECU countries to Kazakhstan was insignificant.

These results confirm the World Bank report (2012) findings. Using a computable general equilibrium model for Kazakhstan, the World Bank (2012) found that the increase of the CET might have a negative impact on Kazakhstan's economy and the decrease of the non-tariff barriers (if trade facilitation costs and NTBs are be decreased substantially) could offset the negative impact of ECU for the economy of Kazakhstan.

CHAPTER 4: THE EFFECT OF THE EURASIAN CUSTOMS UNION ON THE FOREIGN DIRECT INVESTMENT FLOWS TO KAZAKHSTAN

4.1. Introduction

The purpose of this chapter is to examine how the ECU affected FDI flows to Kazakhstan. In the context of Chapter 2, the primary expectations are:

1) The decrease in non-tariff barriers between ECU countries, such as the abolition of the customs controls, the adoption of the single system of phytosanitary norms and a single system of customs regulation and procedures, is likely to increase FDI flows to Kazakhstan. Kazakhstani investors will have access to the extended market of the ECU (markets of Russia, Kazakhstan and Belarus) because there are no barriers to trade between ECU countries.

2) The increase in the common external tariff of Kazakhstan is likely to increase FDI flows to Kazakhstan.

The analysis in this chapter consists of two parts: (1) an analysis of the impact of a decrease of non-tariff costs on FDI; and (2) detecting the impact of the tariff rise in Kazakhstan on FDI. For the first part of the analysis we will use the gravity model and country level data; and for the second part, we will use the locational approach and industry level data.

This Chapter contributes to the existing literature in the following way: it models the extended market effect for FDI flows to Kazakhstan, by comparing CIS countries FDI inflows with ECU countries' FDI inflows; it models the impact of the increased average tariff, this study compares FDI inflows to Kazakhstan before and after the establishment of new tariffs.

The plan of this Chapter is as follows: Section 4.2 analyses how the industry level and country level FDI flows of Kazakhstan and other CIS countries changed over time. Section 4.3 provides details of the theoretical models; section 4.4 describes how the models and econometric techniques are used and the reported results; section 4.5 concludes with the discussion of the results.

4.2. FDI trends

In this section we analyse FDI inflows on a country and an industry level, with industry level data on FDI available only for Kazakhstan. Thus, in order to analyse the extended market effect we use country level data for CIS country. In the country level analysis, comparing CIS countries FDI inflows with ECU countries' FDI inflows.

In order to analyse the impact of the increased average tariff on the Kazakhstan we use industry level data. The data show that major tariff changes occurred in 2008 and 2010 (due

to the establishment of an ECU); thus, in the industry level analysis, we observe which industries show significant changes during 2008 and 2010.

4.2.1 FDI trends at the country level

The trends of FDI inflows in CIS countries tend to correlate with general global trends of FDI. Table 4.1 below shows that from 2004 to 2008, FDI inflows in CIS countries increased as global FDI inflows increased. When global FDI inflows decreased in 2008 and 2009, the inflow of FDI to CIS countries also decreased; then FDI flows started to increase from 2010, both worldwide and in the CIS countries, and decreased again in 2012. Despite a decrease in inward FDI flows in 2008 and 2012, the CIS share of global FDI inflows increased from 4.1% in 2008 to 4.7% in 2008 and from 6% in 2011 to 7.2% in 2012. This evidence indicates a shift of inward FDI allocation to CIS.

FDI inflows by individual country within the CIS region from 2001 to 2012 are shown in Table 4.2 below. Nominal FDI inflows to the CIS region increased almost 10 fold from 9,533 USD mn in 2001 to 99,081 USD mn in 2012. FDI flows from 2001 to 2012 to the region were highly concentrated in two main countries, Russia (54%) and Kazakhstan (24%). Despite the fluctuations of Russia's FDI inflows from 2001 to 2012, Russia has always been the largest recipient of FDI in the CIS region. Both Russia and Kazakhstan faced a steady increase in FDI inflows during this time. For Russia, FDI reached its peak of 74,782 USD mn in 2007, experienced a decline in 2009, and then started to grow steadily, but has not reached the level of 2007 again. There was, however, no reduction in FDI flows to Kazakhstan during the period 2001-2012.

The FDI of Belarus, the third member of the ECU, grew unevenly after a growth of 158% in 2001 when compared with 2000; Belarus's FDI inflows fluctuated until 2006, when FDI increased to 357 USD mn, and thereafter it increased by 406% from 357 USD mn in 2006 to 1,807 USD mn in 2008 and then fluctuated around this figure in 2009 and 2010. In 2011, FDI flows to Belarus more than doubled from 1,393 USD mn in 2010 to 4,002 USD mn in 2011, and dropped again to 1,463 USD mn in 2012.

Table 4.1 Comparison of world and CIS trends of FDI

Year	Indicator	World	CIS countries
2001	FDI inflows in USD MLN	840,033	9,533
	share of global FDI inflows(percent)	*100*	*1*
2002	FDI inflows in USD MLN	630,737	11,096
	share of global FDI inflows(percent)	*100*	*2*
2003	FDI inflows in USD MLN	606,235	17,779
	share of global FDI inflows(percent)	*100*	*3*
2004	FDI inflows in USD MLN	741,986	31,204
	share of global FDI inflows(percent)	*100*	*4*
2005	FDI inflows in USD MLN	1,003,981	36,759
	share of global FDI inflows(percent)	*100*	*4*
2006	FDI inflows in USD MLN	1,489,221	61,563
	share of global FDI inflows(percent)	*100*	*4*
2007	FDI inflows in USD MLN	2,016,873	94,770
	share of global FDI inflows(percent)	*100*	*5*
2008	FDI inflows in USD MLN	1,825,583	117,426
	share of global FDI inflows(percent)	*100*	*6*
2009	FDI inflows in USD MLN	1,230,906	74,397
	share of global FDI inflows(percent)	*100*	*6*
2010	FDI inflows in USD MLN	1,439,282	83,358
	share of global FDI inflows(percent)	*100*	*6*
2011	FDI inflows in USD MLN	1,714,560	103,661
	share of global FDI inflows(percent)	*100*	*6*
2012	FDI inflows in USD MLN	1,347,788	99,081
	share of global FDI inflows(percent)	*100*	*7*

Source of data: United Nations Conference on Trade and Development (UNCTAD), Bilateral FDI statistics (2014)

Other CIS countries followed the same pattern as the ECU countries, growing during the years 2001- 2008, with the biggest growth in Kyrgyzstan and Tajikistan; FDI flows increased almost 40 times in these countries in 2008 in comparison with 2001. There was then a sharp decrease in 2009 in FDI flows to all other CIS countries except Uzbekistan, the FDI of which grew on 18% during 2009. After that there were slight increases in FDI flows to CIS countries during 2010 and 2011, except Armenia where FDI flows continued to decline during the period 2010-2012. In 2012, all other CIS countries experienced a decrease in FDI flows except for Ukraine, Azerbaijan and Tajikistan. The rate of decrease was highest in Uzbekistan (59%), Kyrgyzstan (58%) and Moldova (39%).

Table 4.2 FDI flows to CIS countries, 2001-2012 (USD mn)

Area	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CIS countries	9,533	11,096	17,779	31,204	36,759	61,563	94,770	117,426	74,397	83,358	103,661	99,081
ECU countries	7,401	7,815	12,754	23,926	23,730	50,018	77,099	98,272	59,896	66,807	85,543	80,885
Other CIS countries	2,132	3,281	5,025	7,278	13,029	11,545	17,671	19,154	14,501	16,551	18,118	18,196
Russian Federation	2,748	3,461	7,958	15,444	15,508	37,595	55,874	74,783	36,583	43,168	55,084	50,588
Kazakhstan	4,557	4,106	4,624	8,317	7,916	12,066	19,418	21,301	21,437	22,246	26,457	28,833
Belarus	96	247	172	164	307	357	1,807	2,188	1,877	1,393	4,002	1,464
Ukraine	792	693	1,424	1,715	7,808	5,604	9,891	10,913	4,816	6,495	7,207	7,833
Azerbaijan	900	2,012	3,018	4,192	4,030	3,791	4,442	3,845	3,037	3,615	4,294	5,382
Turkmenistan	170	276	226	354	418	731	856	1,277	4,553	3,631	3,399	3,117
Uzbekistan	83	65	83	177	192	174	705	711	842	1,628	1,651	674
Armenia	70	111	123	247	292	467	668	944	760	529	515	489
Kyrgyzstan	5	5	46	175	43	182	208	377	189	438	694	293
Moldova	103	84	74	146	191	258	541	711	208	208	288	175
Tajikistan	9	36	32	272	54	339	360	376	95	8	70	233

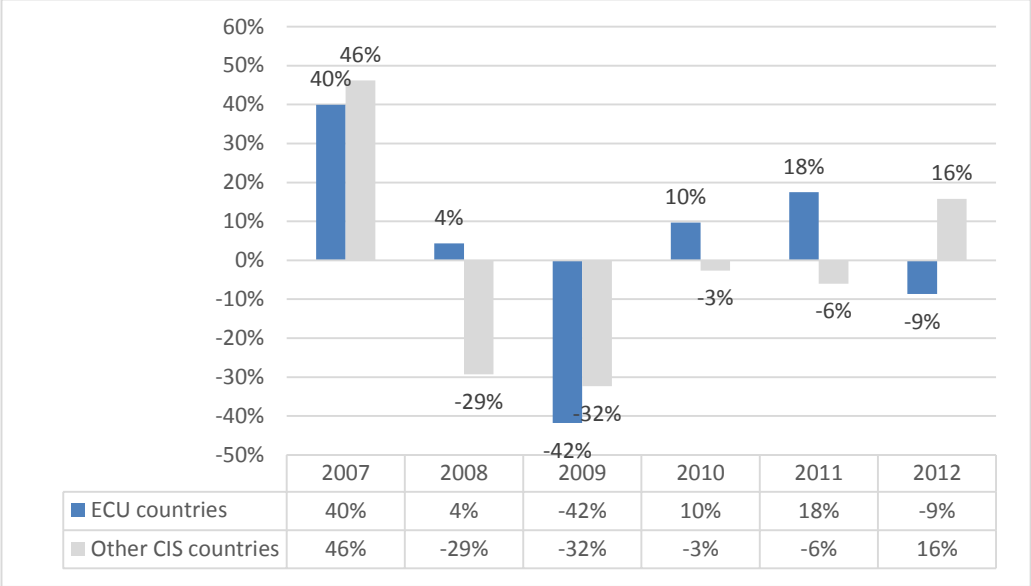
Source of data: United Nations Conference on Trade and Development (UNCTAD), Bilateral FDI statistics (2014)

Table 4.3 below compares the growth rates of real FDI (deflated by country's CPI) in ECU countries and other CIS countries for the years 2007-2012. The ECU was initially announced in 2007, but the crisis of 2008-2009 postponed establishment of it until 2010. As the announcement of the ECU might have triggered an anticipation effect, it was decided to compare the real FDI of the countries starting from 2007. The bar charts show that the annual growth rates of real FDI to ECU countries are smaller than the annual growth rates of FDI to other CIS countries in 2007, 2009 and 2012. ECU countries and other CIS countries experienced growth in 2007 of 40% and 46%, respectively.

In 2008, ECU countries experienced growth in real FDI flows of 4%, whereas, FDI flows in other CIS countries decreased by 29%. In 2009, both ECU and other CIS countries showed a downward trend in real FDI inflows, ECU countries FDI inflows decreased by 42%. Other CIS countries' FDI inflows decreased by 32% in 2009 in comparison with 2008. Starting from 2010 the growth rates of ECU and other CIS countries showed completely opposite trends; while real FDI grew in other CIS countries they decreased in ECU countries.

In 2010 and 2011 FDI flows to ECU countries grew 10% and 18%, respectively, whereas FDI flows to other CIS countries decreased by 3% and 6%, respectively. In 2012, FDI flows to other CIS countries increased by 16%, whilst FDI flows to ECU countries fell by 9%. Based on Table 4.3, we can see that there was no anticipation effect in 2007 as FDI flows to CIS countries grew in 2007, and faced a more moderate decrease in 2009 than FDI inflow to ECU countries. In 2010 and 2011, FDI flows to ECU countries increased, whereas there was a downward trend in the growth of FDI flows to other CIS countries. This might indicate that there was an extended market effect after the establishment of ECU in 2010. However, in 2012 FDI inflows to ECU countries declined, whereas FDI to other CIS countries showed growth. Thus, based on this analysis it is hard to say whether establishment of ECU helped to attract more FDI to members of CU.

Table 4.3 Comparison of growth rates of real FDI flows to CIS and ECU



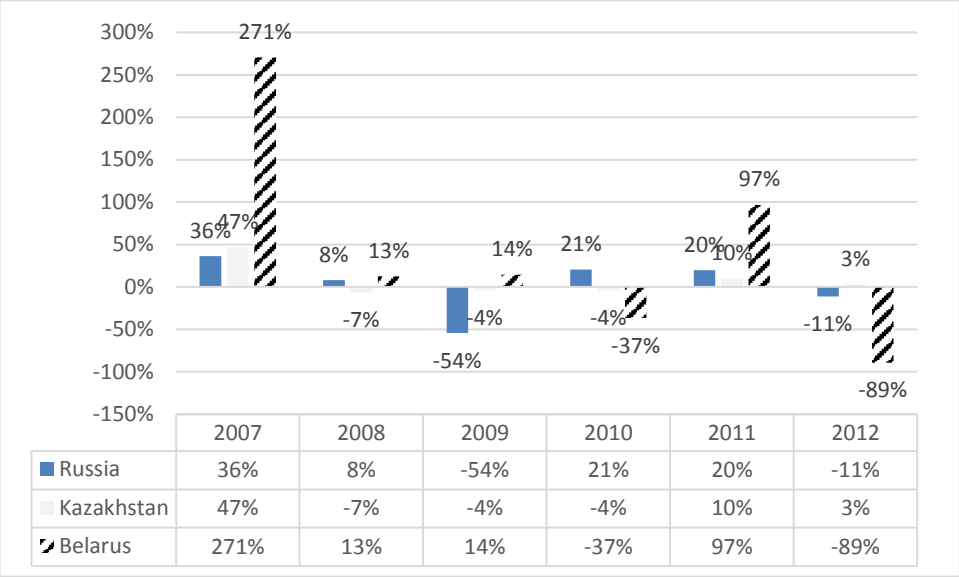
	2007	2008	2009	2010	2011	2012
ECU countries	40%	4%	-42%	10%	18%	-9%
Other CIS countries	46%	-29%	-32%	-3%	-6%	16%

Source of data: UNCTAD, Bilateral FDI statistics (2014)

Table 4.4 below compares annual growth rates of 3 ECU countries. In 2007, the biggest rate of increase in FDI was to Belarus where real FDI flow increased by 271% from 309 USD mn to 1,148 USD mn. The second largest growth rate was in Kazakhstan with an increase of 47% from 16,647 USD mn to 24,429 USD mn. FDI to Russia experienced growth in 2007 of 45% from 50,617 USD mn to 69,009 USD mn. In 2008, Russia and Belarus experienced growth in real FDI flows of 13% and 8%, respectively, whereas, FDI flows in Kazakhstan decreased by 7%. In 2009, FDI inflows to Russia and Kazakhstan decreased by 54% and 4%, respectively, whereas, FDI flows in Belarus increased by 14%. During 2010 real FDI inflows to Russia grew by 21%, whereas real FDI to Kazakhstan and Belarus decreased by 4% and 37%. In 2011, the most significant rate of increase in real FDI was experienced by Belarus, where real FDI grew by 97% in 2011 compared to 2010. The growth rate of real FDI in other countries was significantly smaller: 20% in Russia and 10% in Kazakhstan. Kazakhstani real FDI inflow increased slightly in 2012, and the real FDI to Russia and Belarus decreased on 11% and 89%, respectively. Based on statistics in Table 4.4 below, we can see that after establishment of ECU in 2010 Kazakhstan did not experience any significant changes in levels of FDI inflows. FDI flows in Kazakhstan decreased in 2010 and then grew in 2011 and 2012. Russia's FDI increased moderately in 2010 and 2011 and then decreased slightly in 2012. After the establishment of ECU level of Belarus's FDI inflows was galloping up and down. The level of FDI to Belarus decreased by 37% in 2010 in comparison with 2009, then

increased by 97% in 2011 and after that it decreased again by 89%. Thus, based on this analysis it is hard to say which of the ECU countries benefited more in terms of FDI inflows after the establishment of the ECU.

Table 4.4 Comparison of growth rates of ECU countries



	2007	2008	2009	2010	2011	2012
Russia	36%	8%	-54%	21%	20%	-11%
Kazakhstan	47%	-7%	-4%	-4%	10%	3%
Belarus	271%	13%	14%	-37%	97%	-89%

Source of data: UNCTAD, Bilateral FDI statistics (2014)

The influence of the ECU on the trade of Kazakhstan is that the extended market effect of ECU countries, due to the decrease in non-tariff barriers, seems to be less significant than expected. It was expected that due to the extended market effect FDI flows to ECU countries would increase significantly. Even though FDI growth in ECU countries was greater than in other CIS countries in 2010 and 2011, in 2012 the growth rate of FDI in ECU countries was smaller than the growth rate of FDI in CIS countries.

4.2.2 FDI trends at industry level

While FDI inflows in Kazakhstan have grown steadily since the 2000s, the investment structure and sectorial FDI distribution has also changed significantly. These changes have had far-reaching impacts on Kazakhstan's economy and industry structures. This section will introduce the patterns of FDI sectorial composition in Kazakhstan.

There are four major industries in Kazakhstan. The primary, or agriculture, industry, which includes farming, forestry, animal husbandry and fishery. The second industry, or raw material industry, consists of mining and quarrying, crude oil and natural gas. The third industry is the manufacturing industry and the rest of the sectors are the service based sectors, which include

transportation, storage, post and telecommunication, wholesale and retail trade and catering services, finance and insurance services, real estate management and other service industries (see Table 4.5 below for an overview of all industries).

Table 4.5 FDI flows by sector in Kazakhstan, 2001-2013 (USD mn)

Year	primary industries	resource industries	Manufacturing industries	Service industries	total
2001	5	3,528	643	381	4,557
2002	2	2,909	832	358	4,101
2003	2	3,153	1,001	465	4,621
2004	0	7,007	521	795	8,323
2005	1	6,155	347	1,413	7,916
2006	38	9,240	695	2,109	12,082
2007	18	12,890	1,271	5,428	19,608
2008	38	11,824	2,131	7,307	21,301
2009	6	14,268	1,827	5,497	21,597
2010	6	15,530	2,281	4,468	22,285
2011	8	15,762	5,659	5,040	26,468
2012	18	15,656	3,409	9,852	28,935
2013	6	14,417	2,949	6,968	24,340

Source of data: National Bank of Kazakhstan (2015)

Table 4.6 FDI flows by sector in Kazakhstan, 2001-2013 (in % of total FDI to Kazakhstan)

Year	Primary industries	Extractive industries	Manufacturing industries	Service industries	total
2001	0.11%	77%	14%	8%	100%
2002	0.06%	71%	20%	9%	100%
2003	0.03%	68%	22%	10%	100%
2004	0.00%	84%	6%	10%	100%
2005	0.02%	78%	4%	18%	100%
2006	0.31%	76%	6%	17%	100%
2007	0.09%	66%	6%	28%	100%
2008	0.18%	56%	10%	34%	100%
2009	0.03%	66%	8%	25%	100%
2010	0.03%	70%	10%	20%	100%
2011	0.03%	60%	21%	19%	100%
2012	0.06%	54%	12%	34%	100%
2013	0.02%	59%	12%	29%	100%

Source of data: National Bank of Kazakhstan (2015)

The sectorial distribution of FDI is quite unbalanced in Kazakhstan, with the majority of FDI inflows concentrated on the raw material industry, especially in the crude oil and natural gas industries. Table 4.6 above shows the sectorial composition of foreign-invested firms from

2001 to 2013, from which we see that FDI is heavily biased towards the raw material industry as the single largest FDI recipient, attracting more than 50% of total investments for all sample years. Although the share of resource sector declined dramatically between 2001 and 2013, from 77% in 1991 to 59% in 2008, it is still the most important sector in attracting FDI.

From Table 4.7 below, we can see that there are significantly more investments in the crude oil and natural gas sectors than in other industries (mining of coal and lignite, mining of metal ores and other mining and quarrying). Since its independence, Kazakhstan's top priority has been to develop the hydrocarbon sector. Initially, foreign investments to Kazakhstan went mostly to the hydrocarbon sector. Through investments in oil and gas industries, foreign companies learned how to cooperate with the Kazakhstani government (Kalyuzhnova, 2008). The mining of coal and lignite received the smallest amount of real FDI (FDI deflated by the PPI of its industry) amongst resource sectors. Real FDI to the mining industry was almost negligible with peaks in 2008, 2012 and 2013. Real FDI to mining of ores increased significantly during the period 2001-2011 from 14 USD mn in 2001 to 417 USD mn in 2011; then the level of real FDI to this industry dropped to 179 USD mn and 294 USD mn in 2012 and 2013, respectively.

Table 4.7 Real FDI (deflated by PPI of resource industries) to resource sectors (USD mn)

Sector	Mining of coal and lignite	Crude oil and natural gas	Mining of metal ores	Other mining and quarrying
2001	0	4,163	14	23
2002	8	3,006	22	25
2003	5	3,048	37	32
2004	8	5,462	13	35
2005	10	3,768	84	109
2006	0	4,874	225	92
2007	0	5,200	162	77
2008	33	5,822	183	186
2009	7	5,393	262	0
2010	0	5,012	307	129
2011	2	4,003	417	134
2012	187	3,904	179	165
2013	34	3,639	294	164

Source of data: National Bank of Kazakhstan (figures were deflated using 2005 as a base year)

From Table 4.8 below we can see that investments in the metal processing industry are much higher than in process manufacturing (process manufacturing is common in the food, beverage, chemical and pharmaceutical industries). The level of investment in the processed metals industry increased significantly in 2008, with the average tariff rate increasing from 3.59% to 6.57%. In addition there was a sharp increase in real FDI for the metal industry in 2011, which might have been caused by the increase of industry tariff rates from 6.57% to 12% after the establishment of the ECU in 2010.

The second most attractive sector for FDI was the industry for food products, beverages and tobacco, which attracted 10% of all FDI in the manufacturing industry during the years 2001-2013. The significant rise in the level of FDI in this industry occurred in 2008 and continued to increase during the period 2009-2013. This may have been due to the increase of the tariff rates in 2008 and after the establishment of the ECU in 2010, from 2.7% to 13.8% and from 13.8% to 16.5%, respectively.

The third largest sector in industry is that of computer, electronic and optical products. In the period 2001-2004, the average level of real FDI in the sector was approximately 56 USD mn; however, there were no FDI flows to the industry during the period 2005-2008. In 2008 the tariff rates in the sector increased from 0.36% to 1.7% and, after the establishment of ECU tariff rates, rose again from 1.7% to 5.63%. The year after the first increase in tariff rates, this sector started to attract real FDI, the average level of real FDI to the sector during the period 2009 -2013 was 75 USD mn.

The level of real FDI to almost all other sectors of manufacturing industry (the textiles, clothing, leather and allied products sector; the pharmaceutical sector; the chemicals and chemical products sector; and the machinery and equipment sector) started to increase after the establishment of the ECU and the subsequent increase in tariff rates in these sectors. In the coke and refined petroleum sector, tariff rates decreased in 2008 from 5% to 2.32%, which led to a decrease in real FDI flows to this sector (average real FDI level to this sector was 61 USD mn and 4 USD mn from 2001 to 2007 and from 2008 to 2013, respectively).

Table 4.8 Real FDI (deflated by PPI of manufacturing industries) to manufacturing sectors, 2001-2013 (USD mn)

Sector	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Food products, beverages and tobacco	90	68	44	37	59	64	49	100	100	74	104	134	153
Textiles, clothing, leather and allied products	0	1	3	1	0	5	2	2	2	21	0	12	3
Wood & Wood Products	6	8	10	8	4	6	29	49	1	2	3	2	8
Coke and refined petroleum products	76	113	195	16	30	0	0	15	6	0	1	1	0
Chemicals and chemical products	9	23	7	25	18	12	9	24	45	18	20	13	22
Basic pharmaceutical products	0	0	0	0	0	0	0	0	1	0	2	12	4
Plastics / Rubbers	19	9	41	16	13	19	29	82	44	10	17	37	13
Metals	475	612	618	249	77	228	324	769	501	629	1,368	676	618
Computer, electronic and optical products	67	45	71	71	0	0	0	0	60	54	75	127	61
Electrical equipment	0	0	0	0	41	34	47	65	0	0	0	3	1
Machinery and equipment not elsewhere classified	2	2	3	8	6	4	0	2	4	19	8	18	2
Transport equipment	0	2	2	1	5	62	113	32	9	3	42	16	0
Other manufacturing	2	0	1	2	6	9	8	11	6	7	5	5	20

Source of data: National Bank of Kazakhstan (figures were deflated using 2005 as a base year)

Table 4.9 Real FDI (deflated by PPI of service industries) to service sectors, 2001 -2013 (USD mn)

Sector	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Electricity, gas, steam and air conditioning	32	17	68	9	86	18	20	66	253	45	51	103	89
other utilities	0	0	0	0	0	0	0	0	0	0	4	0	0
construction	28	41	43	129	103	193	232	221	604	540	627	775	543
wholesale and retail	60	93	135	201	278	507	699	675	1,130	679	675	1,013	1,149
Land transport	122	50	38	26	14	15	26	24	9	17	57	77	78
transport via pipelines	0	0	14	0	386	24	13	19	45	39	4	3	5
air transport	10	4	3	0	3	3	3	2	1	4	64	43	40
Warehousing and support activities for transportation	10	27	7	19	43	121	96	45	65	16	59	65	68
Postal and courier activities	13	4	2	44	0	1	1	0	0	0	0	0	0
Accommodation and catering services	24	10	6	10	4	11	28	19	45	26	19	30	0
information and communication services	0	0	0	0	26	121	17	67	189	313	213	2,046	743
Financial services, except insurance and pension funding	43	8	42	53	77	298	1,756	994	259	266	261	951	305
Insurance, reinsurance and pension funding	1	1	4	2	3	9	2	3	3	2	5	1	5
Activities auxiliary to financial services and insurance	0	1	0	0	0	6	4	6	5	4	2	6	41
Real estate operations	10	39	10	7	11	25	43	27	176	61	74	41	60
other services	8	22	16	112	102	104	164	1,650	111	287	296	188	138

Source of data: National Bank of Kazakhstan (figures were deflated using 2005 as a base year)

Another feature of Kazakhstan's sector-level FDI is that there has been a rapid development in the service industry during the last ten years; however, sectors within the service industry still differ significantly from each other. FDI is mainly concentrated in a wholesale and retail trade, as well as construction, and information and communication and financial services; with investments in other sectors such as utility, transport and accommodation and catering to a lesser degree (see Table 4.9 above for details).

Wholesale and retail trade have been the largest FDI recipient in the service industry and their share in total FDI has greatly increased since the 1990s, from 3% in 2001 to 22% in 2013. The importance of this sector has increased steadily over the last 12 years (2001-2013), especially after Kazakhstan entered into the ECU. The second most attractive sector for investment was the financial services sector, which reached its peak in 2007, with growth from 298 USD mn in 2006 to 1756 USD mn in 2007; thereafter, the FDI started to decrease during 2008-2011 falling to the level of 2006 in 2011; it subsequently regained its momentum and continued to rise again after 2012.

Construction also steadily increased over the last 12 years, growing significantly since 2001 from 28 USD mn in 2001 to 543 USD mn in 2013. Other industries (service industries other than wholesale and retail trade; financial services; and construction industries, (see Table 4.9 above for details) followed the same trend with growth during 2001 to 2008 and steady fell from 2009.

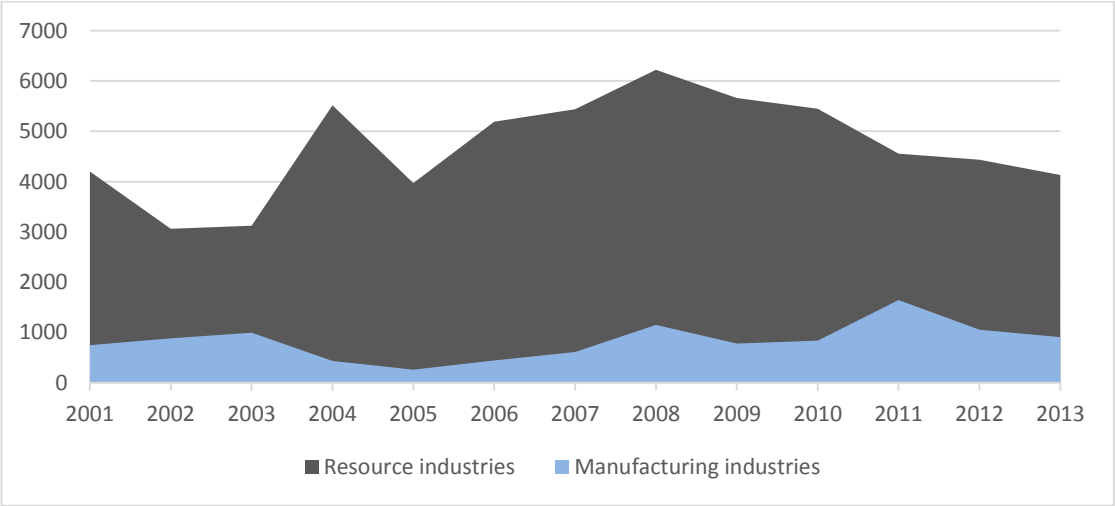


Figure 4.1 Real FDI (deflated by PPI of resource industries) in manufacturing and resource industries, 2001-2013

Source of data: National Bank of Kazakhstan (figures were deflated using 2005 as a base year)

In summary, FDIs in Kazakhstan grew during the period 2001-2008, but decreased following the world crises in 2009 and 2010, and have grown steadily since then. From this analysis we can see that an increase in tariff rates in 2008 and 2010 affected only the manufacturing industry; however its share in overall FDI for Kazakhstan is very small. Figure 4.1 above compares investment in raw materials and manufacturing industries. The black part of the chart is the real investment (deflated by producer's price indices of every industry) to extractive industry. The white part represents FDI to manufacturing industries. We can see that FDI into raw material industry is bigger and has different trends in comparison with manufacturing industries FDI. Whereas FDI into resource FDI has been decreasing sharply since 2008, manufacturing FDI is has mostly been growing since that time. The level of FDI to manufacturing industries increased significantly in the time frame of 2008 and 2011. As mentioned previously this might be due to increase in tariff rates of manufacturing products in 2008 and 2010. An interesting question is whether the increase in FDI in the manufacturing industries can be attributed to the reaction of foreign investors to changes in tariff rates in the manufacturing industries.

4.3. Theoretical Framework

The literature on the theoretical determinants of FDI is fragmented. Different theories emphasise different factors that influence a firm's decision to engage in cross-border investment activities. Some theories focus on macro-economic factors, such as interest rate differentials and exchange rate fluctuations. Others concentrate on micro-economic factors, such as transaction costs arising from the imperfection of markets for intangible assets. Broadly, theories may be grouped according to the three approaches used, namely the capital market, internalization and the locational approaches.

The capital-market approach is supported by many researchers, including Hobson (1914), Jasay (1960) and Aliber (1970). The theory focuses on the movement of capital across the countries and suggests that FDI is motivated by differences in the prices of capital assets, the diversification risks and the imperfections of the market of capital and currency markets. Thus, FDI tends to be directed to countries with relatively high rates of return of investment and also to countries with depreciating of the currencies.

The internalisation theory was first described by Buckley and Casson (1976). According to this theory, FDI is motivated by imperfections in the markets for intangible assets, which

gives rise to ownership-specific advantages, and FDI tends to be undertaken by technologically advanced firms to less technologically advanced host countries.

The third approach the locational approach, explains inter-locational or industry variation in FDI flows according to factors such as the high trade costs, large market size and differences in locational endowments, (Helpman 1984, Markusen et al., 1996 and Markusen 2002). FDI tends to be directed to host locations with a relatively large market size, cheap labour costs and availability of natural resources as well as low/high trade costs.

While theories using the internalization approach (Buckley and Casson, 1976) concentrate on the characteristics and the motivation of FDI, theories using the locational approach tend to focus on the directional aspect of FDI. In contrast, the capital-market approach emphasise the macro-economic or the financial aspect of FDI determinants. These dissimilarities in the three theoretical approaches, suggest that a suitable theoretical basis for the present analysis of FDI in Kazakhstan depends on the aspect of FDI being examined.

In other words, the basis depends on the type of research question being asked, whether it is 'What is FDI?'(internalization theory), 'Why is there FDI?' (capital market theory) or 'Where is there FDI?' (locational FDI). As noted by Dunning (1988), "the question raised will, to a large extent, determine the strand of theoretical frameworks appropriate for its answer". As in the present analysis the aim is to examine the impact of ECU on FDI in Kazakhstan, thus the directional aspect of FDI is the main focus of this analysis; logically then it is appropriate to use the locational approach to model the determinants of FDI in this context.

In addition there is a good reason to assume that the internalisation advantage of firms from developed countries can be taken as given, and it is not presumptuous to say that return on investment is higher in developing countries, such as Kazakhstan, when compared with the return on capital invested in developed countries. The determinants of developed countries' FDI distribution across Kazakhstan's industries will thus be identified and investigated in terms of the locational determinants.

The most promising approaches that explain locational decisions are the gravity model and locational approaches. Location theory integrates two different theories, these are industrial organisation and international trade. Explanations for the spatial concentration of firms is based on the comparative advantages (technological level and differences in labour and capital) of the location (Jones, 1965).

The gravity approach, as discussed in Chapter 3, explains various types of flows, such as trade, investment, migration and tourism (Bergstrand, 1985). Our empirical and theoretical

evidence in Chapter 3, as well as the results in many other studies (Eaton and Tamura, 1994, Brainard, 1997, and Brenton and Di Mauro, 1998), found a two-way dependency of the trade flows. Trade flows depend negatively on the distance between countries and positively on their market size. The gravity approach, as in the ownership, location and internalisation (OLI) paradigm, distinguishes the role of market size and characteristics; however, the impact of distance on FDI is implicit. When the distance increases the transportation costs rise, in this situation it is less expensive to directly produce in the host country in comparison with serving the market via exports.

Another effect of distance is that it increases information costs for the investor, which were suggested by Goldstein and Razin (2003) as a fixed set-up costs of the investor. They also found multinationals invest more in nearby countries as they are more familiar with their legal system in comparison with institutions of more distant countries. Distance, religion and difference in languages were stressed as barriers to FDI in Carnies (1874); and familiarity with customs was emphasised by Senior (1850). Furthermore, investors' control might be affected by the distance, thus by being far from the market, investors will be less familiar with the market and have less control over their investment and surely will have less desire to invest.

To sum up, according to the gravity model the size of the market is positively correlated with FDI flows; however, the direction of the influence of distance on FDI depends on whether the distance is a proxy for information or transportation costs. Information costs will decrease the probability of investment and transportation costs will increase investments as it increases the costs of exports. The following sections discuss empirical work on FDI based on the gravity model and the location approach.

4.3.1 Empirical works on Foreign Direct Investment based on gravity model.

Two aspects of the research of the gravity model for FDI are considered below. The first of these aspects includes research that relates to explaining the effect of CU on FDI, and the second focuses on the influence of the extended market effect as one of the main effects of the ECU on FDI flows of Kazakhstan.

Blomström and Kokko (1997) focus on three regional agreements; the Canada–United States Free Trade Agreement (CUSFTA), the North American Free Trade Agreement (NAFTA), and the free trade agreement between Argentina, Brazil, Paraguay, Uruguay and Venezuela (MERCOSUR) to investigate how regional integration affects FDI flows. Starting

with the effect of CUSFTA on inward FDI to Canada, it seems as if the agreement only had modest effects. This applies to both investment made by the US (members) as well as made by non-member countries. This development may be explained on the one hand by the fact that the US prior to the agreement had invested considerably in its neighbour country and, on the other, that Canada prior to CUSFTA already was very "developed" and liberalized. In other words, CUSFTA did not bring about any noteworthy changes.

Brenton et al (1999) used a gravity model that controls for distance, host country income and population to test for the FDI effect of the economic integration between the EU and the CEECs. Their research did not find any important FDI effects of regionalism. Using the same sample, Di Mauro (2000) proposed a different gravity model specification that controlled for aggregate GDP as well as measures for relative size and relative endowments, remoteness adjusted relative distance between both countries, and a source country fixed effect and measures for tariffs, non-tariff barriers, exchange rate stability and the degree of competitiveness in the destination country. Di Mauro (ibid) did not find a link between the tariff rate and FDI, but between the level of non-tariff barriers and FDI; her results suggested that a preferential trade agreement (PTA), which decreases non-tariff barriers and, as a consequence, leads to an increase in trade by 10%, can be associated with a 10% increase in FDI.

The gravity model has also been used to examine extended market effects (Lim, 2001). Lim's results show that FDI in percentage of the GDP doubled in Spain after its accession to the European Union (EU) in 1986 and more than doubled in the case of Portugal. Greece's accession to the EU in 1981, by contrast, did not trigger a significant increase in FDI inflow, mainly because investor confidence towards the country's macroeconomic structure remained low (Blomström and Kokko, 1997).

Yeyati et al. (2002) used the data for the years 1982-1998 with 60 host countries and 20 source OECD countries to determine the extended market effect. He used two dummies, namely "Extended Market Source" and "Extended Market Host" in the FDI gravity model. Extended Market Host variable is the sum of GDP of all members of FTA of the host country; the Extended Market Source is the sum of GDP of all members of FTA of the host countries. Yeyati et al. (ibid) developed the following specification:

$$\log \mathrm{FDI}_{ijt} = \mathrm{a}_o + \beta_1 \log \mathrm{GDP}_{jt} + \beta_2 \log \mathrm{GDP}_{it} + \beta_3 \mathrm{EMhost}_{it} + \beta_4 \mathrm{EMsource}_{jt} + \beta_6 D_{ij} + \beta_7 Y_t + \varepsilon_{ijt} \qquad (4.1)$$

Here, D_{ij} and Y_t are the country and time fixed effects; EMhost_{it} and $\mathrm{EMsource}_{jt}$ are the "Extended Market Host" and "Extended Market Source" variables. "Extended Market Host" represents FDI creation effect as being the bigger the aggregate market, the more attractive the market for investors. "Extended Market Host" represents FDI diversion effect as it might be when the source country joins new FTA and some FDI can be redirected to new FTA members. The results were following by extending the market via FTA host country become 31% more attractive for investors and when the source country enlarges its market via FTA 15.5% of FTA will be redirected to the members of new FTA. Thus he concluded that joining an FTA increase countries attractiveness for investors.

MacDermott (2007) examined what impact CU may have on FDI. He used a fixed effects gravity model and OECD panel data for the 1982-1997 period. By studying the NAFTA (that went into force 1994), he found that integration spurred FDI for all NAFTA members. MacDermott (ibid) further showed that FDI rises with host and source country GDP and falls with distance.

4.3.2 Empirical work on FDI based on location approach.

Two aspects of the research on the location determinants of FDI will be considered below. The first of these aspects includes those works that relate to the flow of FDI determinants in CIS countries (as Kazakhstan is considered as a CIS country), and the second focuses on the articles that explain the influence of the tariff rates as one of the main effects of ECU on the FDI flows of Kazakhstan.

There is some research that includes CIS countries in the sample, for example, Garibaldi et al. (2001) analysed the determinants of portfolio investment and FDI flows to 25 Central and Eastern European countries; they found that the FDI pattern can be explained by standard economic fundamentals, such as GDP, GDP growth, inflation and the exchange rate, although they did not find a robust role for wage costs. Dummies for liberalization, institutional quality and the legal framework were also significant in their regression.

Campos and Kinoshita (2006) analysed the FDI flow determinants in CIS countries, using the GMM method for 25 countries (all CIS countries were in the sample) for the years 1990 to 1998. Their results implied that FDI flows into the CIS economies are not always explained by low labour cost-seeking or market-seeking types, in contrast with other studies. This might

be explained by the fact that, in contrast with the previous studies, they included lagged FDI. It might be that when the adjustment to the equilibrium level occurs rapidly, the effect of the market size can be gauged by the lagged FDI.

In addition, Campos and Kinoshita (ibid) found that natural resource abundance is one of the most influential variables in their regression, the main reason being that large FDI flows go to resource-rich countries, such as Russia, Kazakhstan and Azerbaijan. Most of the FDI in these countries is distributed unevenly and goes to the resource sectors, thus the motives for these countries' FDI might be quite different from the other transition countries. In the second analysis, Campos and Kinoshita performed a separate regression for CIS countries and other transition countries and found the motives for FDI varied greatly between these two groups. In the CIS countries, FDI is located mostly in the resource sector, with natural resource abundance and infrastructure being the driving factors. In other countries, FDI is mostly located in the manufacturing sector with institutions and persistence as the main considerations for investors. This raises the question as to whether the resource FDI dilutes the effects of the determinants, and requires an analysis at the industry level to separate different determinants for different types of FDI. Johnson (2006) has compared CIS countries with the other transition economies and came to the same conclusion as Campos and Kinoshita (2006) with regards to FDI determinants in CIS countries; however, he did not use lagged FDI as an explanatory variable and, as result, he found a significant effect of the market size on FDI inflows.

There are few works that analyse FDI at the industry level; one of these is Resmini (2000), who concluded that FDI in the Central and Eastern European and Baltic (CEEB) countries mostly goes to the manufacturing sector. Shiells (2003) examined CIS countries at the industry level and, guided by a survey of investors interested in the CIS countries, he found that FDI in CIS countries goes to the resource and energy sectors.

To sum up, in order to explain the determinants of FDI in Kazakhstan, it is crucial to specify an empirical model that includes market size, lagged FDI and market openness. In addition, an analysis needs to be undertaken at an industry level as in the resource-rich CIS countries most of their FDI was directed to extractive and energy related industries, on which macroeconomic variables may have little impact. The key determinant for extractive FDI is likely to be resource abundance, see Blonigen (2005).

Capital flows have different determinants in different industries. Walsh and Yu (2010) found that for manufacturing industries the main determinants are trade openness and the market size, whereas for services they showed that the main FDI determinants are GDP

growth and a clustering effect. Karpaty and Poldahl (2006), Cheng and Kwan (2000), and Gpib (2009) found that capital intensity as a proxy of infrastructure has a positive and statistically significant impact on manufacturing FDI. There is much evidence on the impact of tariff barriers on FDI flows; however, there are no significant studies on the impact of tariffs on the FDI to CIS countries. Blonigen and Feenstra (1996) make a strong case for the significance of tariffs in MNC's location decisions. They looked at the dynamic impact of the creation of trade agreements and found that in order to avoid potential high tariffs, MNCs pushed to invest in the market of the trading bloc. Motta (1992) found that the costs related to the establishment of subsidiaries negatively affects FDI, and an increase in tariff rates had the opposite effect on MNCs, i.e. increases in FDI from MNC.

Girma et al (1999) used data for 223 sectors at the 4-digit SIC level for the years 1988-1996 for all UK firms, to analyse the effect of tariff protection on FDI from Japanese firms. They used industrial sales as market size because it reflects total demand for domestic output, and they found that it had a significant positive effect on FDI flows. They used nominal and effective tariff rates to assess the protection of the UK against Japanese exports; however, the results for both variables were not significantly different from each other as both tariffs tended to be highly collinear. Girma et al (1999) found that market size and tariff rate variables have a significant and positive on FDI flows. These results suggest that the characteristics of the market influences firms into entering foreign markets, and tariff barriers act as an incentive for FDI from Japan to the UK, which validates the theory of Blonigen and Feenstra (1996).

4.3.3 Agglomeration effect

The location and gravity model discussed in sections 4.2.1 and 4.2.2 assumed that the current FDI flows between home and host countries do not depend on the FDIs of previous years. However, from a theoretical perspective, there are good economic reasons to believe that new investors mimic past investment decisions by other investors in choosing where to invest. Krugman (1991) argued that the concentration of firms in one location tends to raise up wage rates, thus causing the migration of labour from other locations. Over time, a pooled market for labour with different specialised skills is formed, and thus act as an incentive for subsequent firms to establish production activities there. The subsequent firms will gain advantages in terms of large available supply of labour with different specialised skills, as well as flexibility of the labour market. To clarify, firms that experience 'a good time' in their

business performances could employ a surplus of workers released from those experiencing 'a bad time'. Workers also gain securities in their employment since the prospect of being unemployed is low. In other words, they are able to switch from one job to another without changing locations.

Another important reason is the large market demand for the available supply of intermediate products. Arguably, with the concentration of firms in the same location, those firms subject to scale economies can be specialised in particular product ranges (or particular processes of production), and depend on the purchases of intermediate inputs from other specialised manufacturers (Krugman and Venables, 1995 and Puga and Venables, 1996). The pecuniary benefits gained from being concentrated in one location are the cost (or forward) and the demand (or backward) linkages. On the one hand, by being close to a number of intermediate suppliers, producers using such intermediates would benefit from available intermediate inputs and perhaps a reduction in input costs. This is because the greater the number of suppliers the lower the price of the products (the forward linkage). On the other hand, by being close to a number of producers using intermediate inputs, suppliers of such inputs would benefit from an increase in sales due to large demand for the products (the backward linkage). Hence, with an increases, in the number of firms, the demand for and/or the supply of intermediate product also increase, as do the benefits gained from the backward and forward linkages. In other words, an entry of new firms will lead to a greater concentration, thus providing more benefits of input-output linkages.

Another reason is the empirical counterpart of the proposal. Mody and Wheeler (1992) make a strong case for the agglomeration effect in decisions of US multinationals in determining where to locate FDI. Ries et al (1995) confirmed the agglomeration effect at an industry-level, based on information of Japanese FDI in US manufacturing industries. Cheng and Kwan (2000) found similar results of an agglomeration effect in China, using panel data model for 29 regions of China. In addition, the agglomeration effect was also tested by Campos and Kinoshita (2006). This effect is important in order to estimate current and future FDI flows; it captured by the inclusion of the lag of FDI stocks in the country or industry.

The conclusions of the analysis of the effect of ECU on the FDI to Kazakhstan from the summary above are as follows:

1) The analysis of tariff rates should be carried out at industry level, as the resource-reach CIS countries received most of their FDI for extractive and energy related industries, on which macroeconomic variables have little impact.

2) Other than country level dummies, the key variables of FDI flows in transition countries are: an agglomeration effect (through the lag of the stock of FDI), market size and openness. Thus we need to control for the impact of these variables to determine the effect of the increase in tariff rates.

In section 4.3, we analyse the impact of the tariff rise on FDI flows to Kazakhstan. The empirical strategy is to control for the main determinants of FDI in CIS countries and to assess for the effects of change of tariffs in the residual.

4.4. Empirical Analysis

4.4.1 Model Specification and Variables Explanation

This section explains the specification for the analysis of the impact of the extended market size and increase of tariff rates on FDI flows of Kazakhstan. Initially, the country level analysis uses the gravity model structure to determine the effect of an increase of the average tariff for Kazakhstan, and the impact of the extended market size. Changes in tariff rates in Kazakhstan mostly happen in manufacturing industries. As most FDI to Kazakhstan goes to extractive industries we might not see the effect of the change in tariff rates at a country level; thus, we turn to an industry level to analyse the effect of the change in tariff rates.

The empirical strategy is to control as many "natural" causes of the FDI flows as possible, and to examine for the effects of changes of the tariffs and the extended market effect. Once other factors have been taken into account, it is anticipated that both an increase in tariffs and the extended market effect will increase FDI flows.

The goal of gravity models is to determine the potential for development of FDI flows between countries. Thus, we will use the panel data set of observations for 13 years from 2000 to 2012 for 8 CIS countries' (target countries) FDI flows from 101 country (source countries). A group of CIS countries was chosen in order to create variability in data and because these countries have strong economic ties with Kazakhstan. The goal of the model is to compare the FDI flows of Kazakhstan with the CIS countries and the ECU countries. The specification of the estimated model tested is the following:

$$\log(\text{FDIflow}_{ij})_t = \text{a}_o + \beta_1 \log(\text{FDIstocks}_{ij})_{t-1} + \beta_2 \text{logGDPsource}_{it} + \beta_3 \text{logGDPhost}_{jt} + \beta_4 \text{logD}_{ij} + \beta_5 \text{NATRES}_{jt} + \beta_6 \text{tariff}_{jt} + \beta_7 \text{POLRISK}_{\text{jt}} + \beta_8 \text{KAZCU}_{jt} + \beta_9 \text{RUSCU}_{jt} + \beta_{10} \text{BELCU}_{jt} + \varepsilon_{it} \quad (4.2)$$

where *i* denotes Kazakhstan and *j* denotes the trading partners (CIS countries), t denotes time, and the variables are defined as:

FDIflow_{ijt}: the real [15]value of FDI flow between country *i* and country *j* at time t,

FDIstocks_{ijt}: the real value of FDI stock in country *j* owned by country *i* at time t-1,

GDPsource_{it} and GDPhost_{jt}: the real GDP of a source and host countries,

D_{ij} is the distance between *i* and *j*, (between capitals of the countries)

NATRES_{jt}: rents from natural resources of the host country,

tariff_{jt}: an average import tariff rate of the host country,

$\text{POLRISK}_{\text{jt}}$: political risk in the host country,

$\text{KAZCU}_{jt}, \text{RUSCU}_{jt}, \text{BELCU}_{jt}$: dummy variables which are 1 if the host country is Kazakhstan, Russia or Belarus respectively (for the years 2010-2013) and 0 if the otherwise.

ε_{ijt} represents the omitted other influences on FDI.

The industry level analysis will investigate the effect of the tariff rate on FDI flows on all industries (including manufacturing industries) and on manufacturing industries separately. The specification of the estimated model tested is the following:

$$\log(\text{FDIflow}_j)_t = \text{a}_o + \beta_1 \log(\text{FDIstocks}_j)_{t-1} + \beta_2 \log(\text{Marsize}_{jt}) + \beta_3 \text{Maropen}_{jt} + \beta_4 \text{tariff}_{jt} + \varepsilon_{jt} \quad (4.3)$$

where as all flows are to Kazakhstan there is no i subscript and j denotes the trading partners (CIS countries), t denotes time and the variables are defined as:

FDIflow_{ijt} : the real[16] value of FDI flow in industry *j* at time t,

FDIstocks_{ijt}: the real value of FDI stock of industry *j* at time t-1,

Marsize: real demand of goods of industry *j* at time t,

Maropen_{jt}: market openness of industry *j*, calculated by dividing the sum of exports and imports in industry *j* by the market size of industry *j*,

tariff_{jt}: average import tariff rate of the industry *j* at time t

ε_{jt}: the omitted other influences on bilateral trade.

FDI stocks in the equations above represent FDI flows of previous years and are included to account for the agglomeration effect discussed in Section 4.2.3. The United Nations

[15]FDI flows and stocks; and GDP were deflated by national CPI.

[16] FDI flows and stocks; and market size were deflated by national PPI of each industry.

Conference on trade and development (UNCTAD), which is the source for FDI stocks used for this chapter, describes FDI stocks as:

"For associate and subsidiary enterprises, it is the value of the share of their capital and reserves (including retained profits) attributable to the parent enterprise (this is equal to total assets minus total liabilities), plus the net indebtedness of the associate or subsidiary to the parent firm. For branches, it is the value of fixed assets and the value of current assets and investments, excluding amounts due from the parent, less liabilities to third parties."

The coefficient of FDI stocks is expected to be positive as it reflects the decision of new investors to mimic past investment decisions by other investors in choosing where to invest.

Most of the empirical work considers the impact of GDP on FDI as GDP considered as a proxy of the market size (Anderson, 1979; Buch et al., 2003; Dunning, 1980; Kim, 2000); however the resource seeking FDI might not be significantly influenced by the GDP (Guerin, 2006). Therefore, the hypothesis is that GDP will have positive sign, but the effect might have a small coefficient.

The distance represents the distance between financial centres of countries and, (section 4.2), the effect of the distance on FDI flows will depend on whether the distance represents transportation or information costs. If it is a proxy of information costs the expected sign of the distance coefficient is negative (Goldstein and Razin, 2003), if transportation costs then the sign is positive (Gopinath and Echeverria, 2004).

Equations (4.2) and (4.3) include market openness, which is determined in this chapter as the sum of imports and exports normalized by market size, as an independent variable to find out the relationship between trade and FDI, whether they are complements or substitutes. As discussed in section 2.3, the relationship between trade and FDI depends on whether the FDI is horizontal or vertical. If FDI is horizontal, with tariff jumping as its motive, then trade and FDI are substitutes, as trade and foreign investment are alternative ways to serve the domestic market (Firms enter a Kazakhstani market through FDI because alternative entry modes, namely exports, incur higher transaction costs). If FDI is vertical, with integration of stages of production as its motive, they are complementary, as trade across the borders will help vertical integration of the investor. Thus, the openness of the CIS economies is expected to have a positive sign if FDI is vertical and negative sign if FDI is horizontal. In this study, market openness refers to total imports and exports, normalized by market size.

Russia, Kazakhstan and Azerbaijan are oil-rich countries, with most of their FDI going to energy and resource sectors; thus, natural resource rents should have a positive effect on FDI;

thus in order to test the effect of natural resources we used a measure of natural resources rents.

We have taken the political stability risk rating of the Economist Intelligence Unit (EIU) by the World Bank as a proxy of political stability risk ($\mathrm{POLRISK_{jt}}$ variable from the country level regression). The political risk of the countries varies from 0 to 100 and is achieved by applying qualitative assessment on a country by country basis. Countries with a zero political risk index have the highest political risk and countries which have a value of 100, the lowest risk of political instability. Political risk is represented by five indicators: international disputes, social unrest, politically motivated violence, orderly political transfer and war. Multinationals will consider political risk in their decisions to invest, which is why it is theoretically appealing to add this indicator to the regression; moreover, the EIU coefficient is available for the multinational to make an investment decision. The coefficient on political risk is expected to have a positive sign (a larger political score is associated with better political stability in the country).

Referring to the theoretical section (section 2.3), where the effect of exports and FDI as substitutes was discussed, and then the effect of an increase in tariff rates should be positive. Higher trade barriers should discourage exports and correspondingly increase FDI.

ECU dummies ($\mathrm{KAZCU}_{jt}, \mathrm{RUSCU}_{jt}, \mathrm{BELCU}_{jt}$) represent a comparison of the ECU countries with CIS countries in the 2010-2013 period (ECU period). CIS countries were chosen as a comparison because they have an FTA agreement with ECU countries - the only difference between ECU and CIS countries is that ECU countries agreed to decrease non-tariff barriers between themselves. It is expected that the decrease of non-tariff barriers will help investors to consider all three ECU countries as one market. ECU dummies are expected to be positive if a country receives more FDI after the establishment of ECU and it is expected to be negative if country started to receive less FDI as result of re-distributive effects within the region.

4.4.2 Estimation methods

The dataset in this study combines cross sections and time series for analysis, providing a rich source of information to investigate the determinants of FDI over time and across countries/industries. In addition it combines pooled regressions longitudinal (panel) methods, which are more suitable for the structure of the data. Panel data analysis enables researchers to observe individuals (industries/countries) over time. The attractive feature of the panel data analysis, which distinguishes panel analysis from OLS, is that it can handle missing or

unobserved variables. There are 2 main specifications for the panel data analysis, namely fixed effects (FE) and random effects (RE), which are different in the way they treat individual specific effects.

If a_i is unobserved and correlated with X_{it}, then the OLS leads to inconsistent estimates as a result of omitted variables. In this case, the model is:

$$Y_{it} = X_{it}\beta + a_i + \varepsilon_{it} \quad (4.4)$$

where a_i specifies an estimable conditional mean and externalizes all the observable effects. The error termε_{it}, contains an individual level effect which is correlated with the regressors, and a common disturbance term. In the fixed effects, FE, regression a_i is a group constant term.

The estimation of the FE model usually involves a 'within-group transformation'. By removing panel-level averages from each side of the equation (4.4), the fixed effects from the model can be eliminated. In this way, OLS estimation on the transformed within-group data will produce consistent estimates of β and the estimators are thus termed 'within estimators'. The model can easily adjust for time-specific effects by including a set of time indicator variables in the regression (if the period time is reasonably small, which is the case in most studies). The significance of the time effect can be checked by a joint test that all the coefficients on the time indicators are zero.

If the unobserved random variable is uncorrelated with any of the explanatory variables, then the model is a random effects, RE model, and can be formulated as:

$$Y_{it} = X_{it}\beta + a_i + u_i + \varepsilon_{it} \quad (4.5)$$

This linear regression model can be estimated by OLS; estimates will be consistent, but not efficient. In the RE approach there is a group-specific random componentu_i, which is entered in each period identically. In addition RE uses more efficient feasible generalized least squares estimator.

Generally, the FE model is more appropriate as it is relatively unrealistic to assume no correlation between the error term and individual observations in a panel data setting. However, there are two main problems with this model. First, it can take up a lot of degrees of freedom as it introduces new parameters into the model, which can make estimation quite

difficult. Second, the effect of time fixed variables cannot be identified; thus, one can only choose RE as an alternative to FE. Moreover, RE is inconsistent when any of the variables correlated with individual effect (Mundlak, 1978) In this study, a Hausman test (Hausman 1978) on the validity of the extra orthogonality conditions imposed by the RE estimator is used to choose between the FE and RE model, and as a result of this test, we use a FE model for the estimation. For the robustness checks, the results of OLS are reported in the Chapter.

4.4.3 Data

Table 4.10 Sources of data

Variable	Source
Country level FDI inflows and inward FDI stocks	The united nations conference on trade and development (http://unctad.org/en/Pages/DIAE/FDI%20Statistics/FDI-Statistics-Bilateral.aspx)
Annual Gross GDP of a reporter country and trading partner country	The World Bank's World Development Indicators, and the IMF's International Financial Statistics for gross GDP data (in constant American dollars). (http://data.worldbank.org/data-catalog/GDP-ranking-table and http://data.worldbank.org/indicator/NY.GDP.MKTP.CD)
Political risk indicator (international country risk)	The World Bank's World Development Indicators. (http://info.worldbank.org/governance/wgi/index.aspx#countryReports)
Distance between trading partners	Centre d'Etudes Prospective et d'Informations Internationales (**CEPII**) for distance between countries : (http://www.cepii.fr/anglaisgraph/bdd/distances.htm)
Total natural resources rents	The World Bank's World Development Indicators. (http://data.worldbank.org/indicator/NY.GDP.TOTL.RT.ZS)
Annual average exchange rate.	The World Bank's World Development Indicators. (http://data.worldbank.org/indicator/PA.NUS.FCRF)
Common border	Centre d'Etudes Prospectives et d'Informations Internationales (**CEPII**) for Contiguity (http://www.cepii.fr/anglaisgraph/bdd/distances.htm)
CPI (Consumer Price Index) deflators on industry and country level; and market size, exports and imports on industry level	The statistical department of Kazakhstan (www.stat.gov.kz)
Average tariff rates on industry and country level	The International Trade Centre (http://www.intracen.org/)

This section describes the data used in the analysis of the impact of the ECU on the FDI flows of Kazakhstan. The variables and sources from which data are clarified in Table 4.10 below. This chapter uses panel data for both analyses. The country level analysis uses the annual panel data set of observations for 12 years from 2001 to 2012 for ECU countries' FDI

flows from 102 countries (see Table A1 in appendix for descriptive statistics), and the industry level analysis uses the panel data set of observations for 13 years from 2001 to 2013 for 34 industries (see Table A.3 and A.4 in appendix for descriptive statistics).

4.4.4 Regression Results

The results of OLS estimation of equation 4.2 are presented in Table 4.11. The OLS estimation allow us to study the effect of the time invariant variable - distance, but it fails to account for country-pair heterogeneity. Since there is often a country pair fixed effect present in bilateral FDI data, conventional cross-sectional estimates of the gravity model are generally biased. The FE model is suitable since it controls for these effects, but it does not specifically determine the importance of the time invariant variables. The equation is divided into separate regressions; in the first regression we include the main variables of the gravity model – distance and market size; then an agglomeration effect variable is included; and in the third regression we add all the remaining variables.

Table 4.11 Country level analysis of Kazakhstani FDI using OLS

Dependent variable - natural log of real FDI flows	**1**	**2**	**3**
Real FDI inward stocks (natural log)		0.737***	0.747***
Real GDP (natural log)	0.363***	0.0456***	0.0408*
Distance (natural log)	0.0127	0.102***	0.0175
Total natural resources rents			0.00218
Exchange rate			0.0578**
Political risk indicator			4.230***
Market openness			0.156
Average tariff rate			-0.0171
Dummy for Russia (2010-2012)	0.324	0.404***	0.468***
Dummy for Kazakhstan (2010-2012)	0.579***	1.099***	0.616***
Dummy for Belarus (2010-2012)	1.007	0.425	0.093
Constant	-3.192***	-0.665	-1.769***
Observations	2151	1751	1751
R^2	0.199	0.654	0.697

(1) *** denotes significance at the 1% level; **, at the 5% level; and *, at the 10% level.

(2) Time specific effects are included in the regression model.
(3) The estimated model is detailed in equation 4.2
(4) Reference category: 5 other CIS countries (namely, Armenia, Azerbaijan, Kyrgyzstan, Tajikistan and Ukraine)

The results from OLS estimates are reported in Table 4.11 above, and show that the GDP coefficient, as expected, has a positive sign; but the effect of GDP on the FDI flows decreases as variables are added. The coefficient of distance is significant and positive, which confirms findings of Gopinath and Echeverria (2004), that distance might influence decision of agents to change from exports (trade) to invest overseas in order to reduce transportation and production costs.

FDI stock variable has a significant and positive effect on FDI as expected. The effects of average tariff rate, market openness and natural resources rent variables on FDI are found to be insignificant. The coefficient of political risk as expected is positive and significant and supports the findings of Beaven and Estrin (2000) that risk factors and general political instability decrease FDI. The key coefficients of the regression, the ECU dummies are positive; they are significant for Russia and Kazakhstan, indicating that these countries have benefited from the extended market effect. Regarding the goodness of fit of the regressions, it is only natural that the more variables are included, the more likely it is that the R-squared value is higher. The third regression has the highest adjusted R-sq. (0.692), followed by regression number two (0.654) and regression number one (0.199).

The results of the FE regressions of equation 4.2 are presented in Table 4.12 above. Here the time invariant variables disappear from the specification, but are captured by the country pair fixed effects. After controlling for country pair heterogeneity, it can be seen that the importance of GDP increases sharply: a 1% increase in source GDP leads to a 0.48% increase in FDI in equation 1, and 0.86% in equation 3. The agglomeration effect is, as expected, positive and significant. However, the importance of political risk diminishes and becomes insignificant in the FE model, which might be due to the fact that the country pair fixed effect may have accounted for political differences between the countries. The effect of the key ECU dummy variables in the FE regression decreases when more variables are added. In the first regression, as in OLS estimation, the Russia and Kazakhstan dummies are significant; in the second regression only the Russian dummy is significant; and when all determinants of FDI are included, all the integration dummies became insignificant.

Table 4.12 Country level analysis of Kazakhstani FDI using FE

Dependent variable - natural log of real FDI flows	1	2	3
Real FDI inward stocks (natural log)		0.240***	0.241***
Real GDP (natural log)	0.480***	0.800***	0.859***
Total natural resources rents			-0.00740
Exchange rate			-0.222
Political risk indicator			-0.166
Market openness			0.170
Average tariff rate			-0.0393
Dummy for Russia (2010-2012)	0.620***	0.319	0.167
Dummy for Kazakhstan (2010-2012)	0.341**	0.134	0.222
Dummy for Belarus (2010-2012)	0.168	0.307	0.450
Constant	-8.405	-24.47***	-26.64***
Observations	2151	1751	1751
R^2	0.1953	0.3637	0.3494

(1) *** denotes significance at the 1% level; **, at the 5% level; and *, at the 10% level.

(2) Time specific effects are included in regression model.

(3) The estimated model is detailed in equation 4.2

(4) Reference category: 5 other CIS countries (namely, Armenia, Azerbaijan, Kyrgyzstan, Tajikistan and Ukraine)

To sum up, the results of estimation of the country level equation using OLS and country-pair FE regressions, suggests that the main gravity variables and agglomeration effect variable, are significant, and have the expected sign in all regressions; the integration dummies show that main winners from the decrease in non-tariff barriers are Kazakhstan and Russia; however in the final FE regression, where we consider all FDI determinants from equation 4.2, both coefficients (of dummies for Kazakhstan and Russia) become insignificant. An F test on all the insignificant variables (natural resources rents, Market openness, exchange rate, average tariff rate and political risk) in the main regression found that all individually insignificant variables are also jointly insignificant. Thus, we can consider the results of regression with GDP and the agglomeration effect variables (row 2 in Table 4.12) as a main result. The coefficients of the extended market effect are also insignificant in this regression.

Table 4.13 Industry level FDI

Method (dependent variable - natural log of real FDI flows)	All industries		Manufacturing industries	
	OLS	FE	OLS	FE
Real FDI inflows (natural log)	0.810***	0.294***	0.668***	0.348**
Market size	0.258***	0.142	0.0976	0.583**
Openness of the market	-0.31	0.0465	-1.005**	-0.425
Average tariff rate	0.0129	0.022	0.0668*	0.126**
Constant	-3.046**	8.184**	2.861	-1.988
Observations	357	357	152	152
R^2	0.689	0.177	0.558	0.212
Number of industries		34		15

(1) *** denotes significance at the 1% level; **, at the 5% level; and *, at the 10% level.

(2) Time specific effects are included in regression model.

(3) The estimated model is detailed in equation 4.3

The results of OLS and FE estimation of equation 4.3 are presented in Table 4.13 above. We have compared data with all industries, as well as the data with only manufacturing industries using an F-test, and find that they have different agglomeration effect slopes. Thus, we have divided the equation into separate regressions; the first regression includes all industries, whereas in the second only information from the manufacturing sectors is included. The agglomeration effect as expected is positive and significant in all regressions. However, other variables show different signs for the all industries and the manufacturing sectors regressions. Market size has no effect on overall FDI flows (all industries) of Kazakhstan, whereas it has a significant effect on FDI in the manufacturing sectors. This confirms the findings of Walsh and Yu (2010) that market size has a positive effect on FDI in manufacturing industries and has no effect on FDI for extractive industries, to which most of FDI in Kazakhstan is directed. The negative sign of the market openness variable in manufacturing industries validates findings of Wheeler and Mody (1992), and indicates that policy restrictions in the manufacturing sector make a location more attractive to the multinationals. The effect of the key variable (tariff rate) is significant and positive. The results of the FE regression suggest that the coefficient on the average tariff rate is statistically

significant at the 5% significance level, with a numerical value of coefficient of 0.126. This suggests, that the increase in tariff rates has contributed positively to the FDI flows to the manufacturing industries of Kazakhstan. The effect of tariff increase is estimated to be a 13.4% (= 100*(e0.126-1)) increase in FDI flows to manufacturing industries if the average external tariff rate of Kazakhstan increases on 1 percentage point (e.g. from 7% to 8%).

The most significant change in tariff rates in the manufacturing industries after the establishment of ECU was in metal processing, the average tariff rates in this industry increased by 5.4 percentage points (from 6.6% to 12%). The smallest change in tariff rates in manufacturing industries after the establishment of ECU was in coke and refined petroleum products industry, the average tariff rate in this industry grew from 2.32% to 2.36% (increase of 0.04%). The largest increase due to establishment of ECU was in the metal processing industry, the growth of FDI in this industry is estimated to be 72% (5.4*13.4%); the smallest increase was in the coke and refined petroleum products industry, which is 0.5% (0.04*13.4%).

As openness of market variable is insignificant in our final regression it was decided to run an FE regression on the manufacturing industries without this variable. The regression without market openness did not change the regression results significantly. All coefficient signs are the same; however, some coefficient have changed slightly. The tariff rate coefficient became significant at 1 percent level and changed from 0.126 to 0.129. Thus, the effect of tariff increase is estimated to be a 13.7% (= 100*(e0.129-1)) increase in FDI flows to manufacturing industries if the average external tariff rate of Kazakhstan increases by 1 percentage point.

Table 4.14 Industry level FDI (the main equation without insignificant variables)

Method (dependent variable - natural log of real FDI flows)	**Manufacturing industries**
	FE
Real FDI stocks (natural log)	0.343**
Market size	0.612**
Average tariff rate	0.129***
Constant	-2.755
Observations	152
R^2	0.211
Number of industries	15

(1)*** denotes significance at the 1% level; **, at the 5% level; and *, at the 10% level.

(2) Time specific effects are included in regression model.

(3) The estimated model is detailed in equation 4.3 without variable of market openness

4.5. CONCLUDING REMARKS

The theoretical and empirical literature indicates that there are two major effects of the ECU that can influence FDI flows to Kazakhstan. First is the extended market effect. Previous research has shown that customs unions and regional trade agreements have the potential to increase foreign investment by increasing the market size available to investors. Taking Kazakhstan as an example, investors with production facilities within Kazakhstan might have gained access to a much larger market after Kazakhstan joined the Customs Union. The larger market is an incentive to invest more. One could claim that market access did not change much because Kazakhstan already had an FTA with Russia and Belarus. The increased market access has not come from tariff reductions, but from the elimination of non-tariff barriers. One of the major steps of integration was the removal of customs stations at borders within the Customs Union in 2010. This and other efforts to reduced non-tariff barriers did actually improve access and increase the exports of goods from Kazakhstan to other ECU countries. This is evidenced by positive coefficient of custom union dummy in export in chapter 3, which showed us that exports increased by about 62% due to the decease of the non-tariff barriers between the ECU countries.

Another reason why FDI flows to Kazakhstan might be affected by the establishment of an ECU is the increase in tariff rates. Mkrtchyan and Gnutzmann (2012) have analysed data on tariffs and found that Russia and Belarus had similar tariff averages prior to the ECU, while Kazakhstan had a noticeably lower tariff average. Higher trade barriers should discourage exports and correspondingly increase FDI; however, the majority of FDI flows into Kazakhstan are connected to the extractive industries. Tariffs and export duties on oil and gas were not harmonized when the Customs Union was implemented; thus much of the Kazakhstani oil flows through pipelines and was not affected by changes in tariffs. Also, FDI in extractive industries is considered as vertical FDI, on which the increase of tariff rates has had no effect; thus, FDI in the extractive sectors was not affected by changes in tariff rates. However, changes in tariff rates have had an impact on FDI for manufacturing industries of Kazakhstan.

This chapter has assessed how the extended market effect and the increase of tariff rates have affected FDI flows to Kazakhstan in a framework that controls for country/industry fixed effects. The results showed that there was no significant extended market effect due to the

decrease in non-tariff barriers. The effect of tariff increase is estimated to be a 12.9% increase in FDI flows to manufacturing industries if the average external tariff rate of Kazakhstan increases on 1 percentage point (e.g. from 7% to 8%).

The Customs Union's positive impact on FDI flows is important for future policymaking because it shows the Customs Union did have benefits for Kazakhstan. The World Bank's (2012) results are mostly negative, but they do not show how the Customs Union impacted foreign investment. My results challenge the idea that the Customs Union had only a negative impact on Kazakhstan by showing the Customs Union's positive impact on FDI flows.

CHAPTER 5: THE EFFECT OF SANCTIONS AGAINST RUSSIA ON THE TRADE OF KAZAKHSTAN

5.1. Introduction

The purpose of this chapter is to examine how the sanctions against Russia enacted by the EU, the USA, Canada, Australia, Japan and Norway affected trade flows to Kazakhstan. The "sanction wars" between Russia and Western countries (EU, US, Norway, Canada, Japan and Australia) had potential to affect economies of the ECU partners as their dependency on the Russian economy was very high. Based on the literature review in Chapter 2, the following expectation are formed:

1) During July and August, 2014 Western countries sanctioned exports of strategic goods (energy-related equipment, military and dual-use goods). In this chapter, Figure 5.1 below illustrates the possible impact of Western' sanctions against Russia on trade flows of Kazakhstan; as illustrated in figure 5.1, Kazakhstan could become a transport hub of supplies to Russia for energy related equipment banned by western countries. Thus, our expectation is that sanctions against Russia are likely to increase imports of strategic goods to Kazakhstan.

2) Russia reciprocated Western sanctions by banning the imports of meat, sea food, dairy, vegetables and other food products from EU, USA, Canada, Australia and Norway on 20 August 2014. These trade sanctions may influence the trade of Kazakhstan, as the trade wars between EU and Russia may decrease trade between Kazakhstan and European countries by breaking up the routes of trade and increasing transportation costs. One of the main routes from Europe to Kazakhstan is through Russian borders and with sanctions in place EU companies may face more meticulous customs controls and delays at the Russian border. Figure 5.1 illustrates that the additional time at border posts will increase transportation costs, which in turn will increase the price; thus, some of the EU companies might find it difficult to trade with CA countries because of the decrease in margins. Thus, we expect that Russian sanctions are likely to decrease imports of agricultural goods to Kazakhstan.

This Chapter will analyse the impact of sanctions (Russian and Western) on imports of Kazakhstan from sanctioning countries. In these analysis we will use post ECU data (from June 2010) and to have more time series observations, we will use monthly data. For the first analysis we will use the univariate time series econometric technique, namely autoregressive moving average (ARMA). Monthly data on the main determinants of the trade is not available.

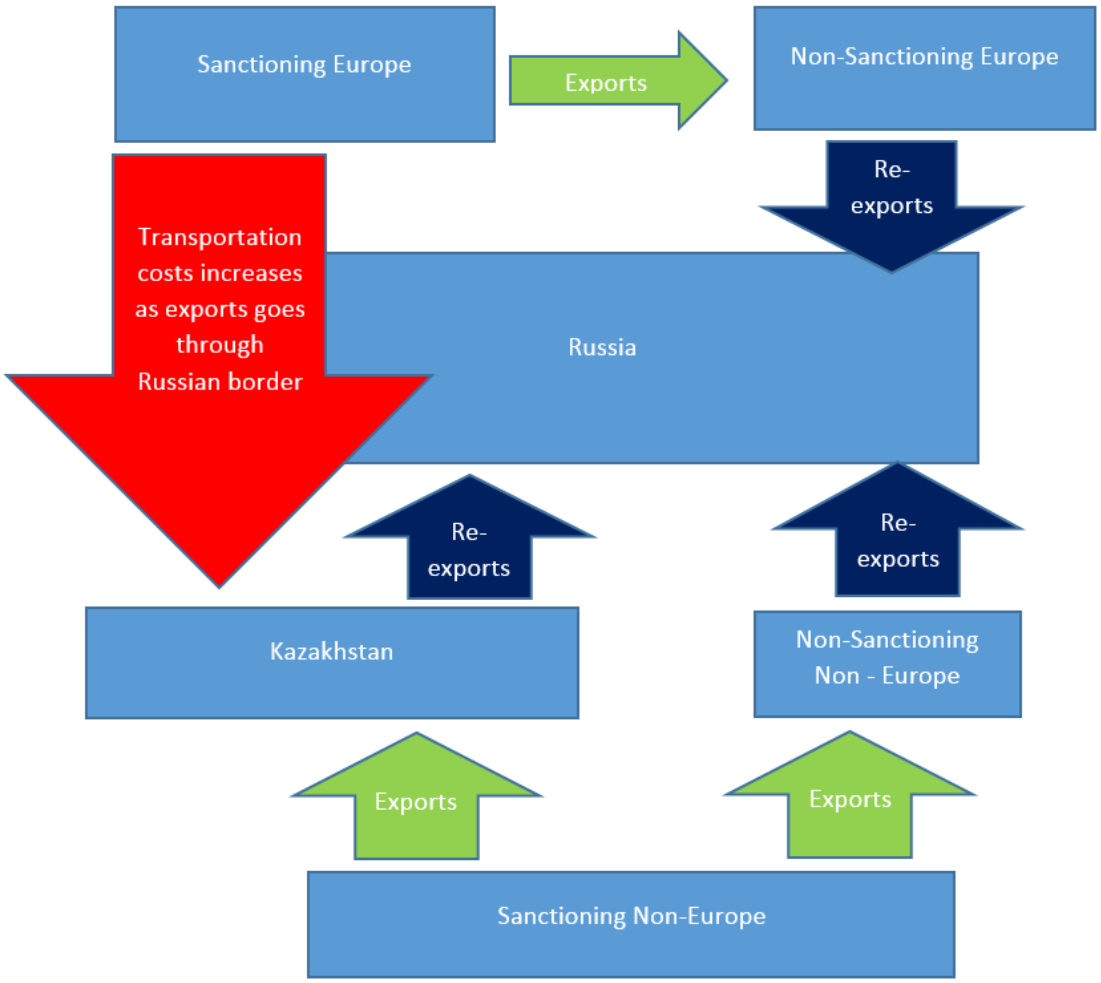


Figure 5. 1 Impact of Russian sanctions on trade flows of Kazakhstan.

Source: author's own elaboration based on the theoretical literature on the effect of sanction on target's neighbours in Chapter 2

In this chapter: Section 5.2 analyses the imports of Kazakhstan and other ECU countries before and after the sanctions. Section 5.3 reviews a literature of empirical work done on the impact of the sanctions on trade of neighbouring countries to the target country; section 5.4 describes how the models and econometric techniques are used; section 5.5 shows how sanction index is calculated and section 5.6 reports the results. Section 5.7 concludes with a discussion of the results.

5.2. Trade trends before and after sanctions

In this section, we analyse imports to Russia, Kazakhstan and Belarus to see whether the analysis matches the theory that Kazakhstan will trade less with the sanctioning Europe (EU

and Norway), and more with other sanctioning countries, namely, the USA, Canada and Australia (to re-export these goods to Russia). Sanctions on imports were imposed on the 7th of August 2014, thus we will compare imports the year before (09.2013-08. 2014) with the year after (09.2014-09.2015) the sanction date. We aggregated imports to 2 HS digit numbers, which will contain only sanctioned trade lines. For example, ships, boats and other floating structures have an HS 2 digit code of 89. However only floating drilling platforms (HS code 89052000) and sea-going light vessels (HS code 89059010) were sanctioned. Under 89 HS digit codes there are many non-sanctioned trade lines, such as 8901 (passenger and goods transport ships), 8903 (yachts) and 8904 (tugs and pusher crafts); however, those lines are irrelevant for the purposes of this analysis. Thus, only sanctioned trade lines will be aggregated into 2 digit trade lines and analysed in relation to our theory. The following 2 digit lines were sanctioned[17]:

1. Meat (HS code 02)
2. Seafood (HS code 03)
3. Milk and Dairy Products (HS code 04)
4. Vegetables, edible roots and tuber crops (HS code 07)
5. Fruits and nuts (HS code 08)
6. Meat, fish and seafood preparations (HS code 16)
7. Malt extract and cacao products (HS code 19)
8. Other food preparations (HS code 21)
9. Tubes and pipes for oil and gas pipelines (HS code 73)
10. Rock drilling parts (HS code 82)
11. Oil pumps and pile driving machines (HS code 84)
12. Floating submersible drilling platforms and cranes (HS code 89)

The data for Kazakhstan is obtained from the Customs Control Committee of the Ministry of Finance of the Republic of Kazakhstan, which have trade data for 10 digit trade lines, whereas the data for Belarus and Russia were taken from the UN Comtrade database, which only have aggregates for 6 digit trade lines. It is impossible to analyse trade data on Russia and Belarus, when the sanctioned goods are not aggregated into 6 digit code trade line. Thus, for the sanctioned goods that have more than 6 digit code aggregation we can only analyse Kazakhstan's imports, otherwise imports of sanctioned goods of all core ECU countries will

[17] The table with information on disaggregated sanctioned lines is in the appendix B (please see Table B.1 and B.2)

be analysed. In section 5.2.1 we will investigate the effect of Russian sanctions on the imports of sanctioned agricultural goods to Russia, Kazakhstan and Belarus. Section 5.2.2 will identify the level of the impact of the Western sanctions on the imports of oil and gas equipment to Kazakhstan.

5.2.1. Changes in imports of agricultural goods across ECU countries before and after sanctions (2013-2015)

This section shows how 2 digit HS level import flows of agricultural products to Kazakhstan, Russia and Belarus (core ECU countries) change during the year after the Russian sanctions, when compared with the year before the sanctions. The imports of eight agricultural product lines were sanctioned by Russia. In order to see the effect of the sanctions we will inspect changes in imports from sanctioning and non-sanctioning countries line by line. The analysis of Russia's import flows will show us whether the sanctions actually work and whether the imports from sanctioning countries were replaced by imports from other countries. A comparison of the import flows of Kazakhstan and Belarus before and after the sanctions will show whether these countries were involved in sanction busting activities. In addition, we will also look at whether the imports from sanctioning countries to Kazakhstan decreased. There is a possibility that due to the sanctions transportation costs from EU to Kazakhstan will increase, which will lead to a decrease of imports to Kazakhstan from non-sanctioning countries. We will analyses only imports of meat, seafood, milk, vegetables, fruits and meat, as well as fish and seafood preparations for all core ECU countries. As mentioned earlier we only have the 6 digit aggregation level data on Russia and Belarus; thus due to the fact that the sanctions on 2 other agricultural trade lines, namely alt extract, cacao and other food products, were imposed on more than the 6 digit code aggregation, they will be analyzed only for Kazakhstan.

The analysis of imports of meat to Russia and Belarus shows that imports of meat (HS code 02) decreased significantly. The year after the sanctions the import of meat to Russia decreased from 5.5 bln USD to 3 bln USD. During that time, the exports of meat from sanctioning countries to Russia decreased significantly from 1.6 bln USD to 3.6 mln USD, whereas the exports from non-sanctioning countries did not decrease as significantly: from 3.9 bln USD to 3 bln USD. (Table 5.1 below for details). This indicates that the Russian sanctions on the imports of meat were effective, and that the imports from sanctioning countries were not replaced by imports from other countries. The same situation happened in

Belarus, where the exports of meat from sanctioning countries decreased significantly from 132 mln USD to 22 mln USD, whereas the exports from non-sanctioning countries did not decrease as significantly from 77 mln USD to 44 mln USD. The decrease of meat imports from sanctioning countries to Belarus show us that Belarus does not re-exports meat from sanctioning countries to Russia.

Table 5.1 Imports of the meat products to Russia, Kazakhstan and Belarus (USD)

	imports Russia		imports Kazakhstan		imports Belarus	
Country	1 year before sanctions	1 year after sanctions	1 year before sanctions	1 year after sanctions	1 year before sanctions	1 year after sanctions
EU	794,562,686	2,369,898	24,205,446	16,473,768	109,564,991	18,755,331
United States of America	380,168,800	0	46,613,133	46,143,762	0	0
Canada	391,667,919	1,190,698	989,671	981,075	23,297,467	3,593,154
Australia	85,295,648	37,427	2,786,516	83,395	0	0
Norway	8,094	29,349	0	0	0	0
Sanctioning countries	**1,651,703,147**	**3,627,372**	**74,594,766**	**63,682,000**	**132,862,458**	**22,348,485**
Russian Federation	0	0	45,206,994	8,213,097	8,780,802	2,330,710
Belarus	863,201,100	629,543,100	23,702,000	13,977,200	0	0
Kazakhstan	12,700,010	11,470,702	0	0	0	0
Brazil	2,086,683,632	1,736,361,269	14,481,785	4,221,201	79,169	2,297,773
Turkey	6,800,653	23,864,707	0	0	6,800	0
India	0	20,503,418	842,787	0	0	0
other non-sanctioning countries	934,148,629	596,567,647	37,527,030	33,127,568	68,594,566	39,903,740
Non-sanctioning countries	**3,903,534,024**	**3,018,310,843**	**121,760,596**	**59,539,066**	**77,461,337**	**44,532,223**
Total	**5,555,237,171**	**3,021,938,215**	**196,355,362**	**123,221,066**	**210,323,795**	**66,880,708**

Source of data: United Nations (UN) Comtrade Database

The imports of meat from sanctioning countries to Kazakhstan did not decrease as significantly as they did to Russia and Belarus. During the year after the sanctions, the import of meat to Kazakhstan decreased significantly from a value of 196 mln USD to 123 mln USD. While imports from sanctioning countries decreased slightly, Kazakhstan's exports from sanctioning countries decreased from 74 mln USD to 63 mln USD, whereas imports from non-

sanctioning countries have decreased by more than double the amount; from 122 mln USD to 59 mln USD (Table 5.1 above for details). The biggest decrease in imports was from Russia, imports to Kazakhstan decreasing from 45 mln USD to 8 mln USD. Kazakhstan's imports from sanctioning countries decreased mostly due to the decrease of exports from the EU and Australia. The decrease of meat exports of meat from the EU might mean that the cost of transportation from the EU to Kazakhstan increased due to the sanctions. In spite of the overall decrease of Kazakhstani imports from the main exporter USA, stayed almost the same after the imposition of the sanction, the USA's share of total exports to Kazakhstan increased greatly, from 24% to 37%. The same is true for Canada. This might indicate that there might have been re-export activities of Kazakhstan from USA and Canada.

The imports of seafood (HS code 03) to Kazakhstan and Russia decreased, whereas the imports to Belarus increased slightly. Russian sanctions on the imports of seafood were effective and the imports from sanctioning countries were replaced by imports from other countries. In the year after the sanctions the overall imports of seafood to Russia decreased by more than double the amount from 2.2 bln USD to 1 bln USD. After the sanctions, exports of seafood from sanctioning countries to Russia decreased significantly from 1.3 bln USD to 60 mln USD, whereas exports from non-sanctioning countries slightly increased from 865 mln USD to 979 mln USD. (Table 5.2 below for details). In addition, Table 5.2 shows that after the imposition of the sanction, Russia exported a lot less sea food to Belarus and Kazakhstan. The decrease of seafood exports from Russia and the decrease of the overall imports of seafood to Russia indicates that after the sanctions Russia produced seafood mainly for itself.

Despite the overall decrease of Kazakhstani seafood imports, the exports of seafood from sanctioning countries to Kazakhstan slightly increased. After the introduction of sanctions, the value of seafood imports to Kazakhstan decreased from 57 mln USD to 53 mln USD, the exports of seafood from sanctioning countries to Kazakhstan increased from 36 mln USD to 39 mln USD, whereas the exports from non-sanctioning countries decreased from 21 mln USD to 14 mln USD. (Table 5.2 above). Imports from Norway and EU increased from 32 mln USD and 3.8 mln USD to 35 mln USD and 4.4 mln USD, respectively. Imports from the USA almost doubled from 0.06 mln USD to 1.3 mln USD. As in the case of Russia, exports from Switzerland and China grew from zero to 4 mln USD and 0.3 mln USD, respectively. The increase of imports of seafood from sanctioning countries to Kazakhstan might potentially mean that sanctioning countries outflank Russian sanctions by re-exporting seafood through Kazakhstan to Russia.

Table 5.2 Imports of sea food products to Russia, Kazakhstan and Belarus (USD)

	imports Russia		imports Kazakhstan		imports Belarus	
Country	1 year before sanctions	1 year after sanctions	1 year before sanctions	1 year after sanctions	1 year before sanctions	1 year after sanctions
Norway	973,604,376	14,669,133	32,535,641	34,981,182	122,027,137	167,274,085
EU	192,938,190	45,570,529	3,851,125	4,440,375	19,947,523	33,930,582
Canada	105,479,173	84,546	138,268	0	0	0
United States of America	92,192,530	499,012	63,004	136,401	229,863	597,175
Australia	2,510,171	0	4,655	0	0	0
Sanctioning countries	**1,366,724,440**	**60,823,220**	**36,592,693**	**39,557,958**	**142,204,523**	**201,801,842**
Russian Federation	0	0	17,765,790	4,154,337	61,860,094	19,280,943
Belarus	112,300,700	148,053,800	672,200	1,149,700	0	0
Kazakhstan	2,999,849	1,834,179	0	0	0	0
Switzerland	0	54,634,891	0	4,609,109	63,658	2,474,242
China	0	9,171,548	0	274,750	0	361,270
Iceland	171,993,536	128,710,034	0	2,020,120	5,804,845	4,395,521
other non-sanctioning countries	578,236,596	636,935,864	2,568,827	1,863,055	12,842,823	6,861,338
Non-sanctioning countries	**865,530,681**	**979,340,316**	**21,006,817**	**14,071,071**	**80,571,420**	**33,373,314**
Total	**2,232,255,121**	**1,040,163,536**	**57,599,510**	**53,629,029**	**222,775,943**	**235,175,156**

Source of data: UN Comtrade Database

During the year after the sanctions the overall imports of seafood to Belarus increased from 222 mln USD to 235 mln USD. The exports of seafood from sanctioning countries to Belarus increased significantly from 142 mln USD to 201 mln USD, whereas the exports from non-sanctioning countries decreased from 80 mln USD to 33 mln USD (Table 5.2 above). Imports from Norway increased from 122 mln USD to 167 mln USD. Imports from EU and USA almost doubled from 20 mln USD and 0.2 mln USD to 34 mln USD and 0.6 mln USD, respectively. The increase of seafood imports from sanctioning countries to Belarus and Kazakhstan show us that Belarus and Kazakhstan might be involved in sanction-busting activities.

Table 5.3 Imports of milk and dairy products to Russia, Kazakhstan and Belarus (USD)

	imports Russia		imports Kazakhstan		imports Belarus	
Country	1 year before sanctions	1 year after sanctions	1 year before sanctions	1 year after sanctions	1 year before sanctions	1 year after sanctions
EU	1,721,707,838	26,736,280	68,402,405	45,623,103	14,393,338	67,823,231
Australia	100,207,689	428,093	590,109	493,238	0	372,105
United States of America	2,823,867	1,041,562	80,110	80,954	0	0
Norway	5,207,492	511	0	0	0	0
Canada	0	0	0	0	0	0
Sanctioning countries	**1,829,946,886**	**28,206,446**	**69,072,624**	**46,197,295**	**14,393,338**	**68,195,336**
Russian Federation			151,165,357	31,648,465	44,664,203	8,430,855
Belarus	2,126,405,300	1,852,266,600	83,652,600	37,654,300	0	0
Kazakhstan	18,367,858	3,506,881	0	0	8,617	7,105
Ukraine	273,257,868	1,010	54,467,899	19,863,731	17,622,371	1,526,474
Switzerland	14,097,101	23,636,873	827,617	378,688	4,433	11,848
Moldova	2,734,581	381,354	6,079,949	5,034,090	0	28,060
Serbia	23,387,971	16,760,774	580,728	0	367,902	96,330
Kyrgyzstan	0	0	0	11,510,490	0	0
other non-sanctioning countries	278,134,009	172,918,178	1,742,172	346,785	0	0
Non-sanctioning countries	**2,736,384,688**	**2,069,471,670**	**298,516,322**	**106,436,549**	**62,667,526**	**10,100,672**
Total	**4,566,331,574**	**2,097,678,116**	**367,588,946**	**152,633,844**	**77,060,864**	**78,296,008**

Source of data: UN Comtrade Database

Table 5.3 above shows that Russian sanctions on the imports of dairy (HS code 04) were effective, and that the imports from sanctioning countries were not replaced by imports from other countries. The effect of sanctions was such that the exports of dairy to Russia and Kazakhstan went down significantly. The decrease in imports to Russia mostly came from the sanctioning countries. During the year after the sanctions, the overall imports of dairy to Russia decreased by more than double the amount from 4.5 bln USD to 2 bln USD. The exports of dairy food from sanctioning countries to Russia also decreased significantly from 1.8 bln USD to 28 mln USD, whereas the exports from non-sanctioning countries did not decreased decrease as significantly from 2.7 bln USD to 2 bln USD. (Table 5.3 above).

Similarly to Russia, imports of dairy to Kazakhstan also went down significantly; however in Kazakhstan's case, the decrease in imports mostly came from non-sanctioning countries

(Russia, Belarus and Ukraine). The exports of dairy from sanctioning countries decreased from 69 mln USD to 46 mln USD, while the exports from non-sanctioning countries decreased almost three times the amount from 298 mln USD to 106 mln USD. Kazakhstan's exports from sanctioning countries decreased mostly due to the decrease of exports from the EU. In spite of the overall decrease in imports of milk and dairy products, exports from the USA and Canada, remained more or less the same. The main reason for the decrease in Kazakhstan's imports from non-sanctioning countries was the decrease of imports from Russia, Ukraine and Belarus. The biggest decrease in imports was from Russia, whose imports to Kazakhstan decreased from 151 mln USD to 31 mln USD. The decrease of seafood exports from Russia to Kazakhstan might have been caused by the decrease of the overall imports of dairy and milk products from Russia, i.e. after the sanctions, Russia started to produce dairy only for itself.

From Table 5.3 it can be seen that there it is highly likely that Belarus started re-exporting dairy products from EU to Russia. The imports of dairy products to Belarus stayed almost at the same level. The year following the sanctions, the overall imports of dairy to Belarus increased slightly from 77 mln USD to 78 mln USD. However, there was a change in structure, after the sanctions most (86%) of the milk products came from the EU, whereas the major exporters to Belarus during the year before the sanctions were Russia and Ukraine, accounting for 80% of all of the imports of dairy to the country. The imports from sanctioning countries to Belarus increased significantly: Belarus' exports from sanctioning EU increased from 14 mln USD to 168 mln USD, whereas the imports from non-sanctioning Russia declined sharply from 44 mln USD to 8 mln USD (see table 5.3).

Table 5.4 below shows that Russian sanctions on the imports of vegetables (HS code 07) were effective, and that the imports from sanctioning countries were not replaced by the imports from other countries. Following the sanctions, the overall imports of vegetables to Russia decreased substantially from 2.2 bln USD to 1.3 bln USD. After the sanctions exports of vegetables from sanctioning countries to Russia also decreased significantly from 1 bln USD to 84 mln USD, whereas the exports from non-sanctioning countries increased slightly from 1.1 bln USD to 1.2 bln USD.

Table 5.4 Imports of vegetables to Russia, Kazakhstan and Belarus (USD)

Country	imports Russia		imports Kazakhstan		imports Belarus	
	1 year before sanctions	1 year after sanctions	1 year before sanctions	1 year after sanctions	1 year before sanctions	1 year after sanctions
EU	1,003,809,507	84,597,322	8,587,129	10,437,898	159,684,225	198,441,277
United States of America	8,780,792	92,013	146,903	0	0	0
Canada	4,759,132	157,069	0	0	0	0
Norway	25,108	372	0	0	0	0
Australia	19,655	0	0	0	0	0
Sanctioning countries	**1,017,394,194**	**84,846,776**	**8,734,032**	**10,437,898**	**159,684,225**	**198,441,277**
Russian Federation	0	0	5,381,266	1,047,481	2,450,856	596,635
Belarus	184,031,200	301,674,600	811,500	15,013,600	0	0
Kazakhstan	3,686,732	1,058,134	0	0	0	0
Rep. of Moldova	11,553,322	1,647,272	20,040	30,691	2,318,808	5,840,669
China	0	27,309,381	0	1,407,781	0	51,945
Kyrgyzstan	0	2,421,479	0	8,917,466	0	15,840
other non-sanctioning countries	970,848,431	883,364,094	2,490,783	1,718,942	37,861,595	25,452,592
Non-sanctioning countries	**1,170,119,685**	**1,217,474,960**	**8,703,589**	**28,135,961**	**42,631,259**	**31,957,681**
Total	**2,187,513,879**	**1,302,321,736**	**17,437,621**	**38,573,859**	**202,315,484**	**230,398,958**

Source of data: UN Comtrade Database

Kazakhstan's imports of vegetables more than doubled mostly due to the increase of imports from non-sanctioning countries. Imports from the EU to Kazakhstan increased, but not to the same extent as the overall increase of vegetable imports to Kazakhstan. Therefore, it is hard to say whether Kazakhstan was involved in the sanction busting activities. During the year after the sanctions overall imports of vegetables to Kazakhstan increased more than 2 times the amount from 17 mln USD to 38 mln USD. After the sanctions, exports of vegetables from sanctioning countries to Kazakhstan increased from 8.7 mln USD to 10.4 mln USD, whereas exports from non-sanctioning countries increased significantly from 8 mln USD to 28 mln USD. (Table 5.4 above). The main reason for the rise in imports was the

increase of exports from Belarus, which rose by more than 15 times from 811 USD'000 to 15 mln USD.

Belarus's imports increased too. However, whereas Kazakhstan's imports increased mostly because of the rise of imports from non-sanctioning countries, Belarus' imports increased mainly due to the increase of imports from sanctioning countries. During the year after the sanctions, the overall imports of vegetables to Belarus increased from 202 mln USD to 230 mln USD. The main reason for the rise in imports was the increase of exports from the EU, which accounted for 79% of all vegetable imports to Belarus during the year before the sanctions, and increased its share to 86% after the imposition of the sanctions. Belarus' exports to Russia doubled after the imposition of the sanctions and exports to Kazakhstan rose by more than 15 times the value prior to the sanctions. The increase in the imports of vegetables from sanctioning countries and in the exports of vegetables to Russia indicates that there is a strong possibility that Belarus might be re-exporting vegetables imported from the EU to Russia.

As in the case of vegetable imports, the imports of fruits (HS code 08) to Russia decreased, whereas the imports to Belarus and Kazakhstan increased after the imposition of the sanctions. Throughout the year after the sanctions the overall import of fruit to Russia decreased substantially from 3.3 bln USD to 1.9 bln USD. After the sanctions, the exports of fruits from sanctioning countries to Russia also decreased significantly from 1.5 bln USD to 120 mln USD, whereas the exports from non-sanctioning countries decreased slightly from 1.82 bln USD to 1.75 bln USD. The biggest rise in the imports of fruits to Russia came from Belarus, where imports increased from 139 mln USD before the sanctions to 213 mln USD after the sanctions (Table 5.5 below).

Kazakhstan's imports of fruits increased mostly because of the rise of imports from non-sanctioning countries, whereas those of Belarus increased mainly due to the increase of imports from sanctioning countries. After the sanctions, the overall import of fruits to Kazakhstan increased from 104 mln USD to 126 mln USD. After the sanctions, the exports of fruits from sanctioning countries to Kazakhstan increased from 45 mln USD to 56 mln USD, whereas the exports from non-sanctioning countries increased from 58 mln USD to 70 mln USD. (Table 5.5 shows the details). As in case of Russia, the imports from Belarus was the main reason of the increase of imports from non-sanctioning countries to Kazakhstan. Belarus' imports increased from 1.4 mln USD before the sanctions, to 45 mln USD after the sanctions.

Table 5.5 Imports of fruits and nuts to Russia, Kazakhstan and Belarus (USD)

Country	imports Russia		imports Kazakhstan		imports Belarus	
	1 year before sanctions	1 year after sanctions	1 year before sanctions	1 year after sanctions	1 year before sanctions	1 year after sanctions
EU	1,339,471,579	116,808,986	44,489,596	56,465,081	323,089,690	392,890,778
United States of America	169,489,874	4,105,068	781,113	158,616	322,960	154,000
Canada	2,548,964	0	0	0	0	0
Norway	19,073	0	0	0	0	0
Australia	9,120,789	0	0	0	156,555	0
Sanctioning countries	**1,520,650,279**	**120,914,054**	**45,270,709**	**56,623,697**	**323,569,205**	**393,044,778**
Russian Federation	0	0	9,078,838	2,495,076	24,590,863	7,007,553
Belarus	139,433,400	213,965,800	1,437,700	45,041,000	0	0
Kazakhstan	5,778,587	2,913,941	0	0	0	0
Rep. of Moldova	69,222,341	19,297,952	1,211,269	6,600,258	18,832,195	62,022,443
Armenia	8,488,579	20,342,541	0	44,988	30,523	23,970
China	0	15,371,628	0	2,059,703	0	0
Kyrgyzstan	0	766,663	0	3,416,940	0	0
other non-sanctioning countries	1,603,899,141	1,481,517,725	47,161,289	10,377,879	34,232,470	19,160,362
Non-sanctioning countries	**1,826,822,048**	**1,754,176,250**	**58,889,096**	**70,035,844**	**77,686,051**	**88,214,328**
Total	**3,347,472,327**	**1,875,090,304**	**104,159,805**	**126,659,541**	**401,255,256**	**481,259,106**

Source of data: UN Comtrade Database

After the sanctions were introduced the overall value of imports of fruits to Belarus increased from 401 mln USD to 481 mln USD. The main reason for the rise in imports was the increase of exports from the EU, which accounted for 81% of all fruit imports to Belarus during the year before the sanctions and increased its share to 82% after the imposition of the sanctions. Exports from Moldova also increased significantly from 18 mln USD to 62 mln USD. However, exports from Russia decreased by almost 4 times after the imposition of the sanctions. As in the case of vegetable imports, there is a strong possibility that Belarus might have re-exported fruits from EU to Russia.

Table 5.6 Imports of meat, fish and seafood preparations to Russia, Kazakhstan and Belarus (USD)

Country	imports Russia		imports Kazakhstan		imports Belarus	
	1 year before sanctions	1 year after sanctions	1 year before sanctions	1 year after sanctions	1 year before sanctions	1 year after sanctions
EU	51,282,817	409,515	294,255	388,540	1,612,048	340,388
United States of America	3,322,232	0	0	0	0	0
Canada	0	0	0	0	0	0
Norway	2,189	1,010	0	0	0	0
Australia	0	0	0	0	0	0
Sanctioning countries	**54,607,238**	**410,525**	**294,255**	**388,540**	**1,612,048**	**340,388**
Russian Federation	0	0	80,053,022	20,046,980	557,505	185,693
Belarus	176,218,300	92,266,000	5,470,600	5,205,900	0	0
Kazakhstan	840,818	500,633	0	0	0	0
Ukraine	4,710,108	366,882	0	0	0	0
Serbia	1,461,478	3,233,727	0	60,135	374,666	181,629
Armenia	0	7,776	0	0	526	0
other non-sanctioning countries	397	2,754	77,169	1,050	0	0
Non-sanctioning countries	**183,231,101**	**96,377,772**	**85,600,791**	**25,314,065**	**932,697**	**367,322**
Total	**237,838,339**	**96,788,297**	**85,895,046**	**25,702,605**	**2,544,745**	**707,710**

Source of data: UN Comtrade Database

Table 5.6 above, clearly shows that after the imposition of the sanctions, the imports of meat preparations (HS code 16) to Russia suffered a drastic decline due to the decrease of imports from sanctioning countries and Belarus. Following the sanctions, the overall imports of meat preparations to Russia decreased to less than half from 238 mln USD to 97 mln USD. The exports of food preparations from sanctioning countries to Russia decreased more than 100 times from 54 mln USD to 410 USD'000, whereas the exports from non-sanctioning countries had a significant decrease from 183 mln USD to 86 mln USD. The biggest supplier of meat, sea and food preparations to Russia was Belarus. Belarus' exports to Russia decreased substantially from 176 mln USD before the sanctions to 92 mln USD after the sanctions. This indicates that the imports from sanctioning countries were not substituted by the imports from other countries. In addition, exports from Russia to Kazakhstan fell almost 4 times from 80 to

20 mln USD. The decrease of Russian exports of meat preparation shows that part of the imports from the sanctioning countries were substituted by Russia's domestic production.

Table 5.6 above shows that the share of imports of meat preparation from sanctioning countries is very small; thus sanctions did not affect the imports from sanctioning countries. The sanctions did not affect the imports of meat preparation from sanctioning countries to Kazakhstan, since the volume of imports from sanctioning countries was negligible the year before and after the sanctions (less than 1% before and after the sanctions). Most of the meat preparations to Kazakhstan came from Russia (94% before the sanctions and 80% after the sanctions). Kazakhstan's imports decreased mostly due to the decrease of imports from Russia. Belarus is considered a net exporter of meat preparations, so it imported much less than it exported. Belarus's exports to Russia decreased to less than half after the imposition of the sanctions and exports to Kazakhstan stayed at the same level. The level of food preparation imports from sanctioning countries did not change either after the imposition of the sanctions. Therefore, neither Belarus nor Kazakhstan were involved in the sanction-busting activities.

Table 5.7 below shows the structure of Kazakhstani imports of malt extract and cacao products. The imports of malt extract and cacao products (HS code 19) to Kazakhstan increased almost 10 times after the imposition of sanction; however mostly due to the increase of imports from non-sanctioning countries. This means that Kazakhstan was not involved in sanction-busting activites. In the year following the sanctions the overall imports of malt extract and cacao products to Kazakhstan increased from 4.7 mln USD to 47 mln USD. The main reason for this was the growth of imports from Ukraine, which grew from 4.4 mln USD to 46 mln USD in one year.

Table 5.7 Imports of malt extract and cacao products to Kazakhstan (USD)

Country	imports Kazakhstan	
	1 year before sanctions	1 year after sanctions
EU	36,817	85,929
United States of America	0	5,911
Canada	0	0
Norway	0	0
Australia	0	0
Sanctioning countries	**36,817**	**91,840**
Russian Federation	288,212	207,029
Belarus	0	600
Ukraine	4,453,073	46,297,928
Turkey	0	1,317
Iran	0	653,038
other non-sanctioning countries	0	0
Non-sanctioning countries	**4,741,285**	**47,159,911**
Total	**4,778,102**	**47,251,751**

Source of data: Customs Control Committee of Ministry of Finance of Republic of Kazakhstan (2015)

The major exporters of other food preparations (HS code 21) to Kazakhstan during the year before the sanctions were Russia, the EU and the Ukraine, accounting for 81% of all imports of other food preparations to the country. During the year after the sanctions, this decreased from 149 mln USD to 108 mln USD. Imports from sanctioning countries decreased slightly, and Kazakhstan's imports from sanctioning countries decreased slightly from 58.9 mln USD to 58.4 mln USD, whereas imports from non-sanctioning decreased by almost double the amount from 90 mln USD to 49 mln USD (Table 5.8). The decrease of imports from sanctioning countries to Kazakhstan was due to the decrease in imports from the EU and Norway, despite an increase in food preparation imports from the USA, Canada and Australia.

Imports from non-sanctioning countries decreased mostly due to the decrease in exports from the Ukraine, with its substantial change from 31 mln USD to 8 mln USD.

Table 5.8 Imports of other food preparations to Kazakhstan (USD)

Country	imports Kazakhstan	
	1 year before sanctions	1 year after sanctions
EU	52,011,727	50,419,225
United States of America	6,711,775	7,792,231
Canada	36,975	48,278
Norway	187,286	168,821
Australia	0	27,829
Sanctioning countries	**58,947,762**	**58,456,384**
Russian Federation	38,475,673	30,036,372
Belarus	432,537	397,436
Ukraine	30,964,694	6,719,698
China	7,621,319	3,737,367
Iran	0	20,940
other non-sanctioning countries	12,742,102	8,978,262
Non-sanctioning countries	**90,236,323**	**49,890,075**
Total	**149,184,085**	**108,346,459**

Source of data: Source of data: Customs Control Committee of Ministry of Finance of Republic of Kazakhstan (2015)

To sum up, an analysis of the imports of agricultural goods shows that the Russian sanctions were effective and that the imports from sanctioning countries to Russia almost disappeared. Furthermore, in all the analyzed trade lines, imports from non-sanctioning countries did not replace imports from sanctioning countries. Additionally, the exports of sanctioned agricultural products from Russia to Kazakhstan and Belarus fell significantly. The decrease in the Russian exports of sanctioned agricultural goods might indicate that most of the imports from the sanctioning countries was substituted by domestic production.

The imports of agricultural goods from the EU decreased for all sanctioned agricultural lines, except for the imports of seafood and vegetables. Kazakhstan imported less meat and dairy products from the EU and, despite the overall decrease in imports of meat and milk products, the exports from the sanctioning countries, the USA and Canada, remained at the same level. This indicates that there might be re-export activities of Kazakhstan from USA and Canada to Russia; and an increase of transportation cost to Kazakhstan from the EU. The imports of vegetables from EU to Kazakhstan also increased, but did not happen to the same extent as the overall increase in the import of vegetables to Kazakhstan, which saw imports more than double. This might indicate that the transportation costs of vegetables from the EU to Kazakhstan through Russia also increased.

Since the imports from EU to Belarus did not go through the Russian borders, the imports of agricultural goods did not decrease. The imports of agricultural goods from the EU either increased or stayed at the same level for all sanctioned agricultural lines. In addition to that, following the sanctions, Belarus' imports of sea food, vegetables and fruit to Russia and Kazakhstan increased significantly (the biggest increase was in the imports of fruits to Kazakhstan, which increased almost 45 times). This indicates that Belarus re-exported sanctioned agricultural goods from EU to Russia and Kazakhstan.

5.2.2. Changes in imports of oil and gas equipment to Kazakhstan before and after sanctions (2013-2015)

This section shows how 2 digit HS level import flows of oil and gas equipment to Kazakhstan change during the year following the Western sanctions when compared with the year before the sanctions. The imports of four oil and gas lines were sanctioned by Western countries. In order to see the effect of the sanctions we will inspect changes in imports from sanctioning and non-sanctioning countries step by step. A comparison of the import flows of Kazakhstan before and after the sanctions will show whether these countries were involved in the sanction-busting activities. In addition, we will also look at whether the imports from the sanctioning countries to Kazakhstan decreased. There is a possibility that due to the sanctions, the transportation costs to Kazakhstan increase, which would lead to a decrease in imports for Kazakhstan from non-sanctioning countries. As mentioned earlier, we only have 6 digit aggregation level data on Russia and Belarus; thus due to the fact that the sanctions on all oil and gas equipment trade lines, (namely tubes and pipes for oil and gas pipelines (HS code 73), rock drilling parts (HS code 82), oil pumps and pile driving machines (HS code 84) and

floating submersible drilling platforms and cranes (HS code 89)), were imposed on more than just the 6 digit code aggregation, they will be analysed only for Kazakhstan.

Table 5.9 Imports of tubes and pipes for oil and gas pipelines to Kazakhstan (USD)

	imports Kazakhstan	
Country	1 year before sanctions	1 year after sanctions
EU	96,728,370	387,051,416
United States of America	3,303,847	10,877,422
Canada	180,447	100,351
Norway	0	0
Australia	0	50,580
Japan	57,542,214	1,371,721
Sanctioning countries	**157,754,878**	**399,451,489**
Russian Federation	353,380,062	140,997,268
Belarus	0	28,800
Ukraine	177,635,671	122,302,262
China	252,267,021	80,455,405
Mexico	49,096,644	21,639,717
other non-sanctioning countries	24,347,602	20,050,614
Non-sanctioning countries	**856,727,000**	**385,474,066**
Total	**1,014,481,877**	**784,925,554**

Source of data: Source of data: Customs Control Committee of Ministry of Finance of Republic of Kazakhstan (2015)

Table 5.9 above shows that Kazakhstan might be re-exporting tubes and pipelines to Kazakhstan from the EU as its imports from EU increased significantly after the establishment of sanctions by Western countries. During the year after the sanctions, the overall imports of tubes and pipes for oil and gas pipelines to Kazakhstan decreased in value from 1014 mln USD to 785 mln USD. The major exporters to Kazakhstan during the year before the sanctions were Russia, China, the Ukraine, the EU and Japan, accounting for 92% of all the imports of tube for oil and gas pipelines to the country. Imports from non-sanctioning countries declined by more than half the amount because two of the biggest importers, Russia and China dropped

their level of imports after the sanctions from 353 mln USD and 252 mln USD to 140 mln USD and 80 mln USD, respectively. Imports from sanctioning countries increased more than doubled due to the increase in imports from EU countries from 96 mln USD to 387 mln USD. (Table 5.9). Thus, after the sanctions a share of the EU's imports of tubes for oil pipelines increased from 10 to 49 %, making the EU the main supplier of the pipelines to Kazakhstan.

Table 5.10 below clearly indicates that there were no re-exporting activities from Kazakhstan, as all of the imports of parts for rock drilling from all of the sanctioning countries fell during the year after when compared with the year before the sanctions. Following the sanctions, the overall imports of parts for rock drilling to Kazakhstan decreased by 3.8 mln USD from 10 mln USD to 7 mln USD. The major exporters to Kazakhstan during the year before the sanctions were the USA, Russia and the EU, accounting for 92% of all imports of rock drilling parts to the country. Imports from all three major suppliers together decreased by 3.9 mln USD. USA, Russia and EU reduced their imports after the sanctions from 5.2 mln USD, 3.2 mln USD and 1.5 mln USD to 3.5 mln USD, 2 mln USD and 0.5 mln USD, respectively. Imports from other countries to Kazakhstan stayed at the same level.

As in the case of parts for rock drilling, the analysis of the imports of parts for oil pumps and pile driving machines does not show any signs of sanction busting activities from Kazakhstan since there was an overall decrease in its imports from sanctioning countries. Following the sanctions, the overall imports of parts for oil pumps and pile driving machines to Kazakhstan decreased by 68 mln USD from 172 mln USD to 104 mln USD.The major exporters to Kazakhstan during the year before the sanctions were China, Russia, USA and EU. These countries accounted for 92% of all imports of oil pumps and pile driving machines to the country. Imports from all four major suppliers decreased by 63 mln USD. China, Russia, USA and EU decreased their imports after the sanctions from 64 mln USD, 42 mln USD, 34 mln USD and 20 mln USD to 38 mln USD, 26 mln USD, 18 mln USD and 13 mln USD, respectively. Imports from other countries have decreased too during the year after sanctions when compared with the figures of the year before sanctions. (please see table 5.11 for details).

Table 5.10 Imports of rock drilling parts to Kazakhstan (USD)

Country	imports Kazakhstan	
	1 year before sanctions	1 year after sanctions
EU	1,537,812	512,049
United States of America	5,265,865	3,548,648
Canada	347,060	337,917
Norway	0	3,622
Australia	3,058	15,329
Japan	0	0
Sanctioning countries	**7,153,796**	**4,417,565**
Russian Federation	3,227,357	2,080,470
Belarus	476	3,050
India	1,649	196,152
China	471,200	377,917
Turkey	28,678	27,612
other non-sanctioning countries	23,060	0
Non-sanctioning countries	**3,752,420**	**2,685,201**
Total	**10,906,217**	**7,102,766**

Source of data: Source of data: Customs Control Committee of Ministry of Finance of Republic of Kazakhstan (2015)

Table 5.11 Imports of parts for oil pumps and pile driving machines to Kazakhstan (USD)

Country	imports Kazakhstan	
	1 year before sanctions	1 year after sanctions
EU	20,421,488	13,688,813
United States of America	33,928,115	17,922,571
Canada	1,930,109	2,218,130
Norway	0	0
Australia	1,676,484	189,225
Japan	823,088	860,510
Sanctioning countries	**58,779,283**	**34,879,248**
Russian Federation	41,826,662	26,592,638
Belarus	294,944	115,744
Mongolia	0	442,202
China	62,516,272	37,879,002
Brazil	3,308,520	1,458,109
other non-sanctioning countries	5,637,726	2,979,350
Non-sanctioning countries	**113,584,124**	**69,467,046**
Total	**172,363,407**	**104,346,294**

Source of data: Source of data: Customs Control Committee of Ministry of Finance of Republic of Kazakhstan (2015)

Table 5.12 Imports of floating submersible drilling platforms and cranes to Kazakhstan (USD)

Country	imports Kazakhstan	
	1 year before sanctions	1 year after sanctions
EU	965,000	1,656,563
United States of America	0	52,390
Canada	0	0
Norway	0	730,000
Australia	0	0
Japan	0	0
Sanctioning countries	**965,000**	**2,438,953**
Russian Federation	180,248	183,342
Belarus	8,667	0
Azerbaijan	1,711,765	0
other non-sanctioning countries	0	0
Non-sanctioning countries	**1,900,680**	**183,342**
Total	**2,865,680**	**2,622,294**

Source of data: Source of data: Customs Control Committee of Ministry of Finance of Republic of Kazakhstan (2015)

Similarly to the imports of tubes and pipes for oil and gas pipelines, in spite of the overall decrease of Kazakhstani imports of drilling platforms, the import of these platforms from sanctioning countries significantly increased. The fact that there was an increase in imports from sanctioning countries when the overall amount of imports decreased might indicate sanction-busting activities from Kazakhstan. Table 5.12 above shows that during the year after the sanctions, the overall imports of floating submersible drilling platforms and cranes to Kazakhstan decreased slightly from 2.8 mln USD to 2.6 mln USD. Imports from non-sanctioning countries decreased from 1.9 mln USD to 0.2 mln USD, while imports from sanctioning countries increased by more than double the amount. The decrease of imports from sanctioning countries was due to the increase in imports from EU countries. The EU's exports increased from 0.9 mln USD to 1.7 mln USD. Thus, after the sanctions, the share of the EU's imports of floating cranes and drilling platforms increased from 34% to 63%.

To conclude, this analysis of imports of equipment for oil and gas to Kazakhstan indicates that the imports of equipment for pipelines and floating machines from sanctioning countries more than doubled due to the increase in imports from EU countries. This leads us to conclude that there were sanction-busting activities in place. Whereas, the imports of parts of rock drilling, oil pumps and pile driving machines decreased not only from the EU, but from other

sanctioning and non-sanctioning countries, which indicates that it might just be a general trend for imports of Kazakhstan in this industry.

5.3. Empirical work on the effect of the trade embargo on neighbours of target country

A review of the literature shows that the analysis of the effects of the trade embargo on target's land neighbour countries is still rare. Slavov (2007) investigated the effect of the sanctions on neighbouring countries of the target state, and developed three hypothesis:

1) As most of the neighbours have an analogous resource endowments they usually import and export the same type of goods. The trade embargo can benefit the neighbours of the target country due to the amelioration of their terms of trade; however, this effect might be slight as most of the countries are too small to influence the terms of trade.

2) It could be expected that sanctions will decrease trade between the target country's neighbours and sanctioning countries. The bilateral trade barriers between neighbours and sanctioning countries could increase as sanctions might break up the trading ties, increase the cost of transportation (if the target country is located between its neighbours and the sending countries). Slavov notes that it is quite possible that trade between Bulgaria and other European countries was disrupted due to the sanctions against Serbia in 1991 and 1995, as Bulgaria traded through Serbia with other European countries.

3) Sanctions give an opportunity of profit for the neighbour countries via sanction-busting activities. Slavov suggests: "Anecdotal evidence on the involvement of neighbour countries in smuggling is overwhelming." (Slavov, 2007, p.1705). Smuggling is hard to quantify as it is not measured by official statistics directly. It can only be quantified by measuring the level of (their) trade with sending countries during the trade embargo period, as they trade on behalf of target countries and then illegally transfer these goods across the border. Thus, although it is not possible to determine the level of smuggling; however, it can be derived via an analysis of the trade of neighbour countries with the sanctioning countries during trade embargo period.

Based on these statements, Slavov concluded that trade embargo could either increase or decrease the trade between neighbours and sanctioning countries:

1) The trade between neighbours and sending countries might fall due to the increase in insurance and transportation costs.

2) Sanctioning countries might trade more with the neighbours as extra goods imported could be smuggled to the target country.

Slavov analysed the effect of sanctions on the trade (exports and imports separately) of 11 target and 33 neighbour countries during the period 1989-2000 using modified gravity model.[18] He estimated the following version of the gravity model:

$$\log(\text{IM or EX}_{ij})_t = \beta_1 + \beta_2 \log \text{D}_{ij} + \beta_3 \log(\text{Y}_i \text{Y}_j)_t + \beta_4 \log(\text{Y}_i \text{Y}_j / \text{pop}_i \text{pop}_j)_t + \beta_5 \text{Cont}_{ij} + \beta_6 \text{Language}_{ij} + \beta_7 \text{Target}_{it} + \beta_{10} \text{Neighbour}_{it} + \varepsilon_{it} \quad (5.1)$$

Where:

IM or EX_{ij_t} denotes the value of imports or exports between country i and country j at time t,

D is the distance between i and j, (between capitals of the countries),

Y is real GDP,

pop is population,

Cont is a binary variable which is unity if i and j have a common border,

Language is a binary variable which is unity if i and j share a common language (1 if both trading partners are in the same continent and 0 if not this is not the same as sharing a common language)

Target is a dummy variable equal to unity for all trading pairs in which the importing/exporting country was a target of trade embargo.

Neighbour is a dummy variable is unity when the importer/exporter in the trading pair is a neighbour to a sanctioned country.

ε_{ijt} represents the omitted other influences on bilateral trade.

Using this model Slavov (ibid) found that all neighbouring countries, except neighbours of South Africa, imported and exported less from the sanctioning countries during the trade embargo episodes. The neighbouring countries of South Africa both imported and exported from sanctioning countries during the years of trade embargo. The difference between South Africa and other target countries is that South Africa had a Customs Union with its neighbours – the Southern African Customs Union (SACU); and the fact that the South African economic system was dominant in SACU (Gibb, 1987). As in the case of South Africa, sanctioned

[18] List of the target countries in Slavov (2007): Afghanistan, Angola, Ethiopia, Haiti, Iraq, Liberia, Libya, Rwanda, Federal Republic of Yugoslavia, Sierra Leone, Somalia and South Africa.

Russia has both a customs union with its neighbours, and all of the ECU members highly depended on trade with Russia. Section 5.3 we will examine whether Kazakhstan's trade was disturbed by the Western sanctions or whether the trade of Kazakhstan increased due to sanction busting activities.

The major drawback of Slavov (2007) paper is that he used total trade as independent variable, whereas trade embargoes usually target specific types of good. This chapter will analyse all 76 series of goods that were sanctioned. However, as monthly data on the determinants of the gravity model by type of product is unavailable, we used univariate time series techniques to analyse the data. The univariate time series technique is described in section 5.3.1

5.4. Estimation method

The interruptions of Kazakhstan's trade with the sanctioning countries is analysed through an ARIMA intervention model. This model will help to comprehend whether the sanctions against Russia impacts on the behaviour of imports from sanctioning countries to Kazakhstan. Box and Tiao (1975) introduced intervention analysis that exactly suits this purpose. The Box and Tiao (1975) model have a following general form[19]:

$$Y_t = C + v(B)I_t + N_t \qquad t=1,\ldots,T \tag{5.2}$$

Y_t is a dependent variable, which represents imports of sanctioned goods from the EU, the USA, Canada, Australia, Japan and Norway,

where C is a constant term,

$v(B)$ is a ratio of lag polynomials; in numerator we have polynomial that captures impulse due to the sanctions and in denominator polynomial that captures patterns of adjustment.

B is the backshift operator,

I_t is an intervention binary dummy variable, which in our case it is 1, after the establishment of the sanctions (August 2014) and 0 otherwise;

and N_t is the stochastic disturbance, which is assumed to be autocorrelated.

[19] Interpretation and derivation of intervention analysis equation is discussed in Vandaele (1983), Mills (1990) and Enders (2010)

The results are then analysed to form an overall index for the effects of sanctions, (see section 5.5). We follow the procedure described below for the intervention ARIMA model for 62 time series (types of goods).

Procedure to obtain a comparability of the time series data needs to be de-trended. We de-trend series if they look visually as if they have a trend, another indicator that series have a trend is when the series has a different results for unit roots on constant plus trend and just constant tests. We de-trend series through regressing independent variables on constant and trend; and taking residuals as an independent variable for future regressions.

The next step after the trend adjustments is the unit root test. If the data is not stationary we could claim that results are meaningful as the non-stationary of a series implies that F -and t- test statistics do not have standard distributions. Thus, the Augmented Dickey Fuller (ADF) test is used before the ARIMA modelling. If series are stationary we continue with the ARIMA model, otherwise we check whether differenced series are stationary and continue modelling with differenced series.

The series is regressed using the SARIMA (Seasonal ARIMA) method. The SARIMA method extends ARIMA by considering the seasonal properties of a series. The ARIMA depends on a weighted sum of its past values (AR) and on the weighted sum of lagged random disturbances (MA). SARIMA accounts for seasonal patterns using seasonal AR and MA (SAR and SMA). A statistically adequate SARIMA model is identified using the Schwarz Bayesian information criterion (BIC). These criteria balance the reduction of error sum of squares and the increase in the number of parameters. The best ARIMA model chosen is that with the lowest value for each information criteria within a maximum model of five AR and MA considered [ARMA(5, 5)].

In addition the dummy variable is introduced to investigate whether there was a structural break after the sanction was established in August 2014. In this method one needs to know the date of the break, which in our case is August 2014. If the dummy variable is significant then there was a break in July 2014, thus a trade creation or diversion because of the sanctions against Russia. To find the best combination of the lag orders of AR, MA, SAR and SMA, based on the information criteria, we used ARIMAsel routine for Eviews 8.

5.5. Sanction index

In the regression we use quantities of goods and regress every trade line separately. As we cannot simply sum up the results of the regressions (for example, growth in quantity of

oranges and bananas), we construct sanction indices using expenditure weights in the base year (broadly the principle of Laspeyres). We do not use the expenditure weights of the current year (the principle of Paasche) as some of the goods might have disappeared after the sanctions were imposed. Here the quantity of goods is denoted as q and prices as p, so the prices of the i-th good before the introduction of the sanctions is $p_{i0}$and p_{it} after the sanctions. The same is applicable for quantities of goods: q_{i0} before the sanctions; and q_{it} after the sanctions. Total expenditure before the sanctions is equal to $\sum_{i=1} q_{i0}p_{i0}$, then $w_{it-1} = \frac{q_{i0}p_{i0}}{\sum_{i=1} q_{i0}p_{i0}}$ is the weight of each good before the sanctions were established.

The expenditure based quantity index using the base (QIB) period is developed as follows:

$\text{QIB}_{it-1} = \sum_{i=1} w_{i0}q_{i0}$, for the period 1;

$\text{QIB}_{it} = \sum_{i=1} w_{i0}q_{it}$, for the second period.

To compare the before and after sanctions case, consider the proportionate difference of QIB:

$$\text{DQIB} = \frac{\text{QIB}_{it} - \text{QIB}_{it-1}}{\text{QIB}_{it-1}} = \frac{\sum_{i=1} w_{i0}q_{it} - \sum_{i=1} w_{i0}q_{it-1}}{\sum_{i=1} w_{i0}q_{it-1}} = \sum_{i=1} w_{i0} \frac{(q_{it} - q_{it-1})}{q_{it-1}} \qquad (5.3)$$

In the formula, $\frac{(q_{it}-q_{i0})}{q_{i0}}$, is the percentage change of the quantity of goods imported between the sanction and non-sanction periods. We have a log-linear model as our dependent variable which is in natural logarithm form; the dummy represents 0 before the sanctions and 1 after the sanctions; thus the estimated coefficient of dummy show the difference in quantity of goods imported to Kazakhstan between the sanction (when dummy is equal to 1) and non-sanction period (when dummy is equal to 1). When we exponentiate both variables we find that percentage change of quantity of goods imported to Kazakhstan (dependent variable) due to switching of the dummy from 0 to 1 is equal to 100*(exponent of estimated coefficient of the dummy-1). As the coefficient on a sanction dummy represent the average quantity difference between the sanction and non-sanction period, we replaced $\frac{(q_{it}-q_{i0})}{q_{i0}}$ by values of the coefficients on the dummy variable.

For example, if there are 2 sanctioned products q_1 andq_2, with coefficients on the sanctions dummy of $\hat{q}_1$= -0.4 and for $\hat{q}_2$=0.35, which means that comparing before and after the sanctions, for the first good, there was an estimated decrease of 33% (100*(e-0.4-1) = 33%) and for the second good an estimated increase of 42% (100*(e0.35-1) = 42%). Thus, in our case q_{1t} will be (- 0.33) and q_{2t} will be 0.42. For example, suppose the QIB weights are w_{10}=

0.7 and w_{20}=0.3, then DQIB = QIB_{it} - QIB_{i0} = $\sum_{i=1} w_{i0}q_{it}$-$\sum_{i=1} w_{i0}q_{i0}$=$\sum_{i=1} w_{i0}(q_{it} - q_{i0})$ =0.7*(-0.33) +0.3*0.42= -0.105. If sanctions has no effect on trade, then the aggregated coefficient is zero. If sanctions have no effect on trade, then the weighted aggregated coefficient is zero. If the coefficient is less than zero and more than minus one, then sanctions led to a decrease in trade. If it is positive then, sanctions increased the trade and there might be sanction busting activities and sanctioning countries re-export some goods to Russia through Kazakhstan. Thus, the DQIB coefficient is positive which indicates that after the sanctions trade increased.

In this methodology if we therefore regress quantity (in kilograms) of all sanctioned trade lines on the sanction dummy, then significant results are aggregated using weights before the sanctions

5.6. Regression results

All agricultural food imports (banned by Russia) series are stationary, however, half of the oil equipment imports series (banned by Western countries) have a unit root. Thus, we have first differenced the series for all import groups banned by the West. The estimation results show that only 25 out 62 trade lines sanctions had a significant sanction dummy coefficient (a coefficient with a p-value less than 0.1 is considered to be significant). From the results of the estimation of trade lines that were sanctioned by Russia (agricultural food), only 16 of 44 were significant. All significant results are negative, showing that imports of agricultural food from sanctioning countries were reduced after the establishment of sanctions. (For the list of the sanctioned agricultural food with significant intervention dummies see Table 5.13 below). The biggest decrease of imports from sanctioning countries was in imports of potatoes and melons, which had negative coefficients -4.12 and -3, respectively. This means that Kazakhstan imported 98% (= 100*(e-4.12-1)) less of potatoes and 95% (= 100*(e-3-1)) less melons from sanctioning countries; the sum of the weights in DQIB of imports of potatoes and melons in total imports of sanctioned agricultural goods is only 0.76%. The overall DQIB weight of sanctioned agricultural goods with significant changes after the introduction of the sanctions is only 14.34%; thus, the sanctions did not have any impact on major trade lines of imports of agricultural goods.

Table 5.13 Regression results from ARIMA intervention analysis of imports of agricultural goods sanctioned by Russia

Customs code number	Title of the trade line	empirical model					Coefficient of sanction dummy	
		trend	AR	MA	SAR	SMA	Coef	Prob.
R0202	Meat of bovine animals, frozen		5	5	included	included	-0.44	0.04
R0203	Meat of swine, fresh, chilled or frozen	included	2	2	included	included	-0.37	0.01
R0304	Fish fillets and pieces, fresh, chilled or frozen	included	2	3	not included	included	-1.35	0.09
R0404	Whey and natural milk products nes		4	4	included	included	-5.7	0.00
R0701	Potatoes	included	5	4	included	included	-4.12	0.04
R70200000	Tomatoes		5	5	included	included	-0.22	0.00
R0703	Onions, garlic and leeks, fresh or chilled	included	4	4	included	included	-1.69	0.00
R0705	Lettuce and chicory, fresh or chilled	included	4	3	not included	included	-0.26	0.00
R0710	Frozen vegetables	included	5	3	not included	included	-0.31	0.00
R0713	Dried vegetables, shelled	included	3	2	included	included	-1.69	0.00
R0803	Bananas and plantains, fresh or dried	included	4	5	not included	included	-1.65	0.00
R0804	Dates, figs, pineapples, mangoes, avocadoes, guavas	included	4	5	not included	included	-0.63	0.00
R0806	Grapes, fresh or dried		4	4	not included	included	-1.74	0.01
R0807	Melons (including watermelons) & papayas, fresh	included	1	3	included	included	-3.00	0.00
R0813	Dried fruit		3	5	included	included	-0.27	0.02
R160100	Sausage&simprod of meat,meat offal/blood&food prep basd on these prod		2	3	not included	included	-1.88	0.00

(Table shows the results only if the intervention dummy is significant at least at 10% level)

From the results of estimation of trade lines that were sanctioned by Western countries (oil and gas equipment), only 9 out 16 were significant. The results are mixed: 4 lines have positive and 5 have negative coefficients. Table 5.14 below shows the list of the sanctioned oil and gas equipment with significant intervention dummies. The biggest decrease of imports from sanctioning countries was in imports of not submerged iron pipelines (6 digit ECU trade code is 730512), with an estimated coefficient on the sanctions dummy of -0.36. This means that Kazakhstan imported 30% (= 100*(e-0.36-1)) less of not submerged iron pipelines from sanctioning countries.

The biggest increase of imports from sanctioning countries was in imports of submerged iron pipelines (6 digit ECU trade code is 730511), with an estimated coefficient on the sanctions dummy of 0.99. This means that Kazakhstan imported 168% (= 100*(e0.99-1)) more of submerged iron pipelines from sanctioning countries. Imports of submerged iron pipelines have a weight of 0.0474 = 4.74% in DQIB. After the sanctions, Kazakhstan imported steel submerged pipelines with a value of 625 mn USD from Japan and Germany, whereas they had not previously bought any tubes from these countries. There might be a particular reason why Kazakhstan bought these pipelines. In 2013, Kazakhstan planned production of one of the largest oilfields in the world (Kashagan oilfield), but due to a leak in the pipeline, production was stopped. As there was no way to repair the pipelines, the Kazakhstani government decided to replace them deciding by buying pipelines of higher quality from Japan and Germany. Thus, it was planned to buy 200 kilometres of steel submerged pipelines from Germany and Japan, as part of a plan to spend over 1 billion USD on the pipes.[20]

[20] New Europe (2015) The budget of the trouble-ridden Kashagan project for 2015 will be $4.2 billion

Table 5.14 Regression results from ARIMA intervention analysis of imports of oil and gas equipment sanctioned by Western countries

Customs code number	Title of the trade line	empirical model					Coefficient of sanction dummy	
		trend	AR	MA	SAR	SMA	Coef.	Prob.
W73041100	Tubes, pipes and hollow profiles, seamless, of iron (other than cast iron) or steel: Line pipe of a kind used for oil or gas pipelines: Of stainless steel		3	5	included	included	-0.33	0.00
W73041930	Line pipe of a kind used for oil or gas pipelines, seamless, of iron or steel (excl. products of stainless steel or of cast iron) not exceeding 406.4 mm	included	1	5	not included	included	-0.12	0.00
W73041990	Line pipe of a kind used for oil or gas pipelines, seamless, of iron or steel (excl. products of stainless steel or of cast iron) exceeding 406.4 mm		3	1	included	included	0.22	0.01
w730511	Line pipe of a kind used for oil or gas pipelines, with an external diameter of exceeding 406,4 mm, of iron longitudinally submerged arc welded	included	1	5	included	included	0.99	0.02
w730512	Line pipe of a kind used for oil or gas pipelines with an external diameter of exceeding 406,4 mm, of iron , longitudinally arc welded (not submerged arc welded)	included	4	1	included	included	-0.36	0.00
W841350	Reciprocating positive displacement pumps nes		2	5	included	included	0.05	0.00
W841360	Rotary positive displacement pumps nes		2	2	included	included	-0.07	0.10
W84138200	Pumping units for oil industry		5	3	included	included	-0.33	0.00
W8413920000	Parts of liquid elevators	included	4	4	included	included	0.14	0.01

(Table shows the results only if intervention dummy is at least at 10% level)

I aggregated the significant results using expenditure weights of the period before the sanctions (see derivation of aggregate sanction coefficients in section 5.5). The aggregate sanction coefficient shows the magnitude of the impact of sanctions against Russia on the imports from sanctioning countries to Kazakhstan. The results have shown that imports of goods sanctioned by Russia (agricultural food) decreased slightly: DQIB is -0.08. Imports of goods sanctioned by Western countries have not increased significantly, the aggregation coefficient is 0.11. Thus, we can conclude that imports to Kazakhstan were moderately affected by the increased transportation costs and there is a small chance that Kazakhstan is involved in sanction-busting activities.

5.7. CONCLUDING REMARKS

The literature (Slavov, 2007, Early, 2009 Khitakhunov, 2016) indicates that there are two major effects of trade wars between Western countries and Russia that can influence imports from Western countries to Kazakhstan. First, there may be increased transportation costs; and, second, that Kazakhstan might try to re-export sanctioned goods to Russia, that is 'sanction busting'.

Previous research by Slavov (2007) has shown that that all neighbour countries, apart from neighbours of South Africa, imported less from the sanctioning countries during the trade embargo episodes. The neighbour countries of South Africa both imported and exported from sanctioning countries during the years of trade embargo. As discussed the difference between South Africa and other target countries is SACU and the domination of South African economic system in SACU (Gibb, 1987). As in the case of South Africa, sanctioned Russia has both a customs union with its neighbours, and all of the ECU members highly depend on trade with Russia.

This chapter has used ARIMA intervention analysis to assess how the sanction against Russia affected imports from sanctioning countries to Kazakhstan. The results shows that imports to Kazakhstan were moderately affected by the increased transportation costs, and that Kazakhstan is not generally involved in sanction-busting activities. The aggregated coefficient of sanctions on imports of agricultural products is estimated to be a -0.08, which means that imports from sanctioning countries decreased slightly after the sanctions. The aggregated coefficient of sanctions on imports of oil and gas equipment is also 0.11.

CHAPTER 6: CONCLUSION

Since the establishment of the ECU, Kazakhstan's trade policy has experienced considerable change. The tariff rates in Kazakhstan with countries outside of the ECU almost doubled, with average tariff rates increasing from 6.45 in 2009 to 12.02% in 2010 (Jandosov and Sabyrova, 2011). There was no changes in tariff rates of Kazakhstan with other ECU countries as all of the ECU countries have been in FTA since 1994. However, there was a decrease in NTB between ECU countries: countries abolished custom controls, adopt single system of phytosanitary norms and single system of customs procedures and regulations. EBRD (2012), ADB (2012) and EDB (2012) assessed changes in NTB after the establishment of the ECU and concluded that NTB have decreased significantly.

The main aim of this research was to analyse the effect of ECU on trade and FDI inflows of Kazakhstan. The first chapter examined the theoretical part, analysing the effect of the main consequences of the ECU for the economy of Kazakhstan. This chapter gave rise to questions that was answered in Chapters 3, 4 and 5 of the dissertation. This work has undertaken an investigation into the effect of the ECU on trade and FDI flows of Kazakhstan; and contributed to the literature on ECU by applying empirical analysis on the latest country and industry level data.

First question of the thesis was whether increase of CET would divert imports from non-ECU countries. We have used dynamic gravity model and GMM econometric technique to make a country level analysis of the impact of CET on trade of Kazakhstan with non-ECU countries. For the measures of CET we used average tariff rates calculated by Jandosov and Sabyrova (2011) and found that the increase of tariff rates decreased imports of Kazakhstan. However, the accession of Russia and Kazakhstan to the WTO will lead to a decrease in tariff rates of the ECU and as result decreased trade diversion. Shepotylo and Tarr (2012) calculated that after Russia implemented all commitments to the WTO, average un-weighted tariff rates of ECU would decrease from 13 to 5.8%.

The second question was whether the decrease of NTB increased trade flows of Kazakhstan with other ECU countries. We used the dynamic gravity model and PMG econometric technique to make a country-level analysis on the impact of NTB on trade of Kazakhstan with ECU countries. The decrease of NTB was estimated to increase exports of Kazakhstan to the ECU countries; however the impact of the decrease of NTB on imports of the ECU countries to Kazakhstan was insignificant. These results showed that NTB actually decreased, and Kazakhstani producers are benefiting from it. However, as mentioned in ADB (2012) there is

still room for improvement for trade facilitation between ECU countries. Thus, further improvement of trade facilitation might increase the trade between ECU countries even more.

The third question was whether the increase in the CET of Kazakhstan might increase FDI flows to Kazakhstan. Higher trade barriers should discourage exports, and correspondingly increase FDI. However, the majority of FDI flows into Kazakhstan are connected to the extractive industries. Resource industries were one of the big exceptions within the Customs Union. Tariffs and export duties on oil and gas were not harmonized when the Customs Union was implemented. Much of the Kazakhstani oil flows through pipelines, and was not affected by changes in tariffs. Thus, the analysis was made (on FDI) for manufacturing industries of Kazakhstan. We undertook an industry level analysis using FE estimation method, and found that the increase in external tariffs have risen FDI flows to manufacturing industries.

The fourth question was whether the decrease in NTB between ECU countries would create an extended market effect, which in turn might increase or decrease FDI flows to Kazakhstan. We used the panel data set of observations for 13 years from 2000 to 2012 for 8 CIS countries (target countries), and FDI flows from 101 country (source countries). A group of CIS countries was chosen in order to create variability in the data, and because those countries have strong economic ties with Kazakhstan. The goal of the model was to compare FDI flows of Kazakhstan with the CIS countries and the ECU countries. The results of FE estimation were positive, but insignificant, which indicated that there was no significant extended market effect due to the decrease in NTB and suggested that countries of ECU should work on improvement of trade facilitation to achieve the extended market effect.

The contradictions of opinions of Western countries and Russia, (one of ECU countries), resulted in bilateral sanctions between Russia and Western countries, namely EU countries, the USA, Norway, Australia and Japan. EU countries, the USA, Norway, Australia and Japan banned exports of oil and gas equipment to Russia; in response Russia banned imports of agricultural products from these countries. These events may have affected Kazakhstan's trade flows: Kazakhstan might have tried to re-export sanctioned goods to Russia or sanctions may decrease trade between Kazakhstan and sender countries by breaking up the routes of trade and increasing transportation costs.

We analysed the impact of sanctions on imports from sanctioning countries. In these analyses we used post-ECU data (from June 2010), and to have more time series we used monthly data. The univariate time series econometric technique, namely ARIMA, was used as monthly data on the main determinants of the trade was not available. We regress quantity (in kilograms) of all sanctioned trade lines on intervention dummy (with a value 1 after the

sanctions was established, and 0 otherwise), then significant results were aggregated using expenditure weights of the period after the sanctions. If sanctions had no effect on trade, then the aggregated coefficient is zero. If the coefficient was less than zero and bigger than minus one, then sanctions decreased the trade. If it is positive then, sanctions increased the trade and there might be sanction-busting activities, and sanctioning countries might re-export some goods to Russia through Kazakhstan. The results shown that imports of goods sanctioned by Russia (agricultural food) decreased slightly and imports of goods sanctioned by Western countries increased significantly. Thus, we can conclude that imports to Kazakhstan were moderately affected by the increased transportation costs and Kazakhstan might have been involved in sanction-busting activities.

To sum up, the empirical finding suggest that the increase of tariff rate negatively affected imports to Kazakhstan from non-ECU countries, however it increased FDI to manufacturing sector of Kazakhstan. But this effect is temporary, as due to entry of Kazakhstan and Russia, countries are obliged to lower their tariff rates by 2020. Thus, within this period it is important to encourage FDI in manufacturing industries as in 2020 Kazakhstan will have to lower the tariffs. The finding also suggested that the decrease of NTB between ECU countries has increased the exports of Kazakhstan; however the NTB was not lowered enough to create an extended market effect for investors. Thus, it is important for policy makers to work on lowering the NTB and to enhance access to the markets for the companies of the ECU region. In addition results of ARIMA analysis on imports of Kazakhstan suggests that imports of Kazakhstan were moderately disturbed by trade wars between Russia and Western countries.

This dissertation has developed a systematic analysis of the impact of the ECU. It empirically investigates the link between FDI, trade, and change in trade policy. In addition, it analyses the effect of the sanctions on the trade of the target countries' CU neighbors. The dissertation contributes to the literature by using latest available industry and country level data. This study extends the previous papers on ECU in the following way:

First, the dissertation uses most recent data to analyse the impact of ECU policies on trade flows of Kazakhstan. In this study we separate the effect of the changes in tariffs and non-tariffs barriers, whereas previous studies did not separate these effects. However, this approach ignores the fact that these two consequences of CU have dissimilar effect on FDI and trade flows. The increase in tariff leads to the decrease of trade with non-members of the CU and the decrease in non-tariff barriers would lead to a deeper integration and more trade with countries' members of the CU.

Second, this thesis is among the first to conduct an industry-level analysis on FDI in Kazakhstan. Whilst most papers on FDI in Kazakhstan are concerned with the total volume of FDI. In addition, there is limited research on the effect of change in trade policy on FDI flows to Kazakhstan. In comparison with the other studies our result shows more positive outcome of the ECU for Kazakhstan. The Customs Union's positive impact on FDI flows is important for future policymaking because it shows the Customs Union did have benefits for Kazakhstan. The World Bank's (2012) results are mostly negative, but they do not show how the Customs Union impacted foreign investment. My results challenge the idea that the Customs Union had only a negative impact on Kazakhstan by showing the Customs Union's positive impact on FDI flows.

Third, in this thesis we estimated the effect of the consequences of sanctions against Russia on agricultural, oil, and gas industries of Kazakhstan. One of the gaps of the literature on sanctions is that no one analyzed what happened with CU neighbor of target countries except of Slavov (2007) which remains the only one empirical study. However, Slavov (2007) used the total trade as independent variable, whereas, trade embargoes usually target specific types of goods. In this study we analyze the impact on the imports of goods that were sanctioned. To aggregate the data we developed sanction index, which serves as an indicator on whether the sanctions harmed economies of countries which are in the CU with the target country. The approach and sanction index developed in this study are generalizable to other custom unions, blocks, and countries subjected to sanctions. Furthermore, this approach provides a framework that could be further used in other publications explaining effectiveness of the sanctions.

Potentially, this project has important policy implications for the government of Kazakhstan and Eurasian Economic Commission. This dissertation gives the following recommendation to the policy makers in Kazakhstan and Eurasian Economic Commission.

Firstly, as this analysis demonstrated, the increase of tariff rate negatively affected imports to Kazakhstan from non-ECU countries; however, it increased FDI to manufacturing sector of Kazakhstan. Nevertheless, this effect is temporary, as due to entry of Kazakhstan and Russia, countries are obliged to lower their tariff rates by 2020. Thus, within this period it is important to encourage FDI in manufacturing industries as in 2020 Kazakhstan will have to lower the tariffs.

Secondly, the findings in Chapter 3 and 4 also suggested that the decrease of NTB between ECU countries has increased the exports of Kazakhstan; however, the NTB was not lowered

enough to create an extended market effect for investors. Thus, it is important for policy makers in Eurasian Economic Commission to work on lowering the NTB and to enhance access to the markets for the companies of the ECU region.

Thirdly, results of ARIMA analysis on imports of Kazakhstan suggest that imports of Kazakhstan were moderately disturbed by trade wars between Russia and Western countries. According to our analysis on imports of sanctioning goods to Kazakhstan, the imports of agricultural goods has decreased moderately from sanctioning countries and there are signs of trade deflection of oil and gas equipment throughout Kazakhstan to Russia. These results showed that unilateral actions of Russia might bring instability to the EEU. Thus, if union is to remain, it is important for the Eurasian Economic Commission to create a policy and guidance for such cases.

Whilst this dissertation has developed a systematic analysis of the impact of the ECU on trade and FDI flows, further analysis requires more data than was available. Thus, we need to specific limitations in this dissertation. The analysis on the impact of the tariff and non-tariff barriers could have been done at industry level if we had industry production levels for developing countries, especially for CIS countries. This lack of data at industry level FDI inflows on CIS countries made it is impossible to do the analysis of extended market effect at industry level, thus we have done it at country level. The lack of the data on imports to Russia and Belarus on 10-digit level of aggregation did not allow for proper sanction analysis on these countries. In addition, the industry level data on production of developing countries would have helped me to compare Kazakhstan's consequences of the sanctions against Russia, with other similar economies. Therefore, one of the directions of the future research would be to update the current data for doing the analyses at the industry level.

Another area of the future research could be the use of case studies and surveys. This dissertation uses empirical approaches to the secondary data, which allow accurate assessment of the effect of the ECU. However, case studies and surveys on changes in patterns of FDI and trade at the firm level could provide better understanding of the effect of the ECU. The industry analysis would show industries that were most affected by ECU in terms of trade and FDI inflows. Then, based on information obtained, the firms from these industries will be chosen for surveys and caseworks; the surveys would permit a better understanding of the impact of various barriers on the trade and FDI flows to Kazakhstan, resulting in quantitative assessment of the effect of change in trade barriers that is presented with more precision.

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APPENDICES

APPENDIX A DESCRIPTIVE STATISTICS

Table A.1 Descriptive statistics for analysis for detecting the impact of the tariff rise on imports to Kazakhstan for the period between 2000 and 2012 years

Variable	Number of observations	Mean	Standard deviation	Min	Max
Real Imports (natural log)	6066	10.07	4.48	-4.61	19.78
Countries' Real GDP (natural log)	7569	39.73	2.85	30.45	48.81
Countries' Real GDP per capita (natural log)	7554	7.17	1.74	1.48	11.44
Real Exchange rate	7605	381.83	1209.13	0[21]	25018.42
Area of the trading partner	7605	11.23	2.77	3.04	16.65
Area of the reporting country	7605	14.57	1.81	12.24	16.65
Distance (natural log)	7605	8.58	0.77	5.13	9.77
Continent	7605	0.45	0.50	0	1
COMECON	7605	.11	0.31	0	1
Border	7605	0.036	0.19	0	1
Average tariff rate	7605	10.06	3.33	0	12.04

Table A.2 Descriptive statistics for analysis for detecting the impact of the decrease of non-tariff barriers in Kazakhstan for the period between 2000 and 2013 years

Variable	Number of observations	Mean	Standard deviation	Min	Max
Real Imports (natural log)	532	17.038	2.6689	11.212	22.569
RealExports (natural log)	532	16.886	2.4875	5.5574	21.453
Countries' Real GDP (natural log)	532	45.747	2.2779	41.796	50.913
Countries' Real GDP per capita (natural log)	532	12.902	1.3588	9.876	17.798
Real Exchange rate	532	33.776	59.277	0.0066	358.02
Eurasian customs union dummy	532	0.0602	0.238	0	1

[21] For few observation, we have not found exchange rate

Table A.3 Descriptive statistics for country level analysis for the period between 2000 and 2012 years

Variable	Number of observations	Mean	Standard deviation	Min	Max
Real FDI inflows (natural log)	2,224.00	12.43	2.31	0.20	19.31
Real FDI inward stocks (natural log)	3,940.00	12.47	2.65	0.00	21.22
Partner country's Real GDP (natural log)	9,504.00	20.44	5.8	14.02	25.73
Reporter country's Real GDP (natural log)	9,696.00	19.73	1.90	17.13	23.71
Distance (natural log)	9,696.00	8.28	0.83	5.13	9.77
Total natural resources rents	9,696.00	17.38	18.93	0.41	68.17
Political risk indicator	9,696.00	0.41	0.12	0.10	0.60
Average tariff rate	9,696.00	5.19	2.94	0.00	10.95
Dummy for Russia (2010-2012)	9,696.00	0.03	0.17	0.00	1.00
Dummy for Kazakhstan (2010-2012)	9,696.00	0.03	0.17	0.00	1.00
Dummy for Belarus (2010-2012)	9,696.00	0.03	0.17	0.00	1.00

Table A.4 Descriptive statistics for industry level analysis for the period between 2000 and 2012 years

Variable	Number of observations	Mean	Standard deviation	Min	Max
Real FDI inflows (natural log)	393.00	16.89	2.36	6.69	22.65
Real FDI inward stocks (natural log)	389.00	17.80	2.15	11.93	24.05
Market size	428.00	21.26	1.40	16.03	24.39
Openness of the market	428.00	0.33	0.28	0.00	1.00
Average tariff rate	442.00	2.38	3.66	0.00	16.64

APPENDIX B LIST OF SANCTIONED GOODS

Table B.1 Agricultural goods, which were banned by Russia[22]

HS Code	Name of goods *,***
201	Meat of cattle, fresh and chilled
202	Meat of cattle, frozen
203	Pork fresh, chilled or frozen
207	Meat and food by-products of poultry, indicated in the HS item 0105, fresh, chilled or frozen
0210	Meat salted, pickled, dried or smoked
0301, 0302, 0303, 0304, 0305, 0306, 0307, 0308	Live fish and crustaceous, molluscs and other aquatic invertebrates
0401, 0402, 0403, 0404, 0405, 0406	Milk and dairy products
0701, 0702 00 000, 0703, 0704, 0705, 0706, 0707 00, 0708, 0709, 0710, 0711, 0712, 0713, 0714	Vegetables, edible roots and tuber crops
0801, 0802, 0803, 0804, 0805, 0806, 0807, 0808, 0809, 0810, 0811, 0813	Fruits and nuts
1601 00	Sausages and similar products from meat, meat by-products or blood; prepared meat products prepared therefrom
1901 90 110 0, 1901 90 910 0, 2106 90 920 0, 2106 90 980 4, 2106 90 980 5, 2106 90 980 9	Food or prepared products (except for biologically active additives, vitamin and mineral additives, flavourings, protein concentrates (of animal and plant origin) and their mixes; food fibres, food additives (including complex ones)

[22] Banned HS codes and their names are taken from GOVERNMENT OF THE RUSSIAN FEDERATION RESOLUTION Of 20 August 2014 No.830

Table B. 2 Oil and gas equipment, exports of which to Russia was banned by Western countries (EU, USA, Canada, Australia, Japan and Norway)[23]

HS Code	Name of goods *,***
7304 11 00	Line pipe of a kind used for oil or gas pipelines, seamless, of stainless steel
7304 19 10	Line pipe of a kind used for oil or gas pipelines, seamless, of iron or steel, of an external diameter not exceeding 168,3 mm (excl. products of stainless steel or of cast iron)
7304 19 30	Line pipe of a kind used for oil or gas pipelines, seamless, of iron or steel, of an external diameter exceeding 168,3 mm but not exceeding 406,4 mm (excl. products of stainless steel or of cast iron)
7304 19 90	Line pipe of a kind used for oil or gas pipelines, seamless, of iron or steel, of an external diameter exceeding 406,4 mm (excl. products of stainless steel or of cast iron)
7304 22 00	Drill pipe, seamless, of stainless steel, of a kind used in drilling for oil or gas
7304 23 00	Drill pipe, seamless, of a kind used in drilling for oil or gas, of iron or steel (excl. products of stainless steel or of cast iron)
7304 29 10	Casing and tubing of a kind used for drilling for oil or gas, seamless, of iron or steel, of an external diameter not exceeding 168,3 mm (excl. products of cast iron)
7304 29 30	Casing and tubing of a kind used for drilling for oil or gas, seamless, of iron or steel, of an external diameter exceeding 168,3 mm, but not exceeding 406,4 mm (excl. products of cast iron)
7304 29 90	Casing and tubing of a kind used for drilling for oil or gas, seamless, of iron or steel, of an external diameter exceeding 406,4 mm (excl. products of cast iron)
7305 11 00	Line pipe of a kind used for oil or gas pipelines, having circular cross-sections and an external diameter of exceeding 406,4 mm, of iron or steel, longitudinally submerged arc welded
7305 12 00	Line pipe of a kind used for oil or gas pipelines, having circular cross-sections and an external diameter of exceeding 406,4 mm, of iron or steel, longitudinally arc welded (excl. products longitudinally submerged arc welded)
7305 19 00	Line pipe of a kind used for oil or gas pipelines, having circular cross-sections and an external diameter of exceeding 406,4 mm, of flat-rolled products of iron or steel (excl. products longitudinally arc welded)
7305 20 00	Casing of a kind used in drilling for oil or gas, having circular cross-sections and an external diameter of exceeding 406,4 mm, of flat-rolled products of iron or steel
7306 11	Line pipe of a kind used for oil or gas pipelines, welded, of flat-rolled products of stainless steel, of an external diameter of not exceeding 406,4 mm
7306 19	Line pipe of a kind used for oil or gas pipelines, welded, of flat-rolled products of iron or steel, of an external diameter of not exceeding 406,4 mm (excl. products of stainless steel or of cast iron)
7306 21 00	Casing and tubing of a kind used in drilling for oil or gas, welded, of flat-rolled products of stainless steel, of an external diameter of not exceeding 406,4 mm
7306 29 00	Casing and tubing of a kind used in drilling for oil or gas, welded, of flat-rolled products of iron or steel, of an external diameter of not exceeding 406,4 mm (excl. products of stainless steel or of cast iron)
8207 13 00	Rock-drilling or earth-boring tools, interchangeable, with working parts of sintered metal carbides or cermets
8207 19 10	Rock-drilling or earth-boring tools, interchangeable, with working parts of diamond or agglomerated diamond
8413 50	Reciprocating positive displacement pumps for liquids, power-driven (excl. those of subheading 8413 11 and 8413 19, fuel, lubricating or cooling medium pumps for internal combustion piston engine and concrete pumps)
8413 60	Rotary positive displacement pumps for liquids, power-driven (excl. those of subheading 8413 11 and 8413 19 and fuel, lubricating or cooling medium pumps for internal combustion piston engine)
8413 82 00	Liquid elevators (excl. pumps)

[23] Banned HS codes and their names are taken from COUNCIL REGULATION (EU) No 833/2014 of 31 July 2014

8413 92 00	Parts of liquid elevators, n.e.s.
8430 49 00	Boring or sinking machinery for boring earth or extracting minerals or ores, not self-propelled and not hydraulic (excl. tunnelling machinery and hand-operated tools)
8705 20 00	Mobile drilling derricks
8905 20 00	Floating or submersible drilling or production platforms
8905 90 10	Sea-going light vessels, fire-floats, floating cranes and other vessels, the navigability of which is subsidiary to their main function (excl. dredgers, floating or submersible drilling or production platforms; fishing vessels and warships)