



КОНСОРЦИУМ ЭКОНОМИЧЕСКИХ ИССЛЕДОВАНИЙ И ОБРАЗОВАНИЯ
ECONOMICS EDUCATION AND RESEARCH CONSORTIUM
Working Paper Series

ISSN 1561-2422

**REGIONAL AND INTERNATIONAL
TRADE OF ARMENIA:
PERSPECTIVES AND POTENTIALS**

Grigor Hayrapetyan

Viktoriya Hayrapetyan

Working paper No11/14E

This project (No R10-0421) was supported
by the Economics Education and Research Consortium
and funded by GDN

All opinions expressed here are those of the authors
and not those of the Economics Education and Research Consortium

Research dissemination by the EERC may include views on policy,
but the EERC itself takes no institutional policy positions

Hayrapetyan Grigor, Hayrapetyan Viktoriya. Regional and international trade of Armenia: perspectives and potentials. – Kiev: EERC, 2011. – 48 p.

Research area: International trade.

JEL classification code: F10, F13, F14, F17.

Abstract: Unfavorable geopolitical situation and small scale of economy, trade balance deficit and raw-materials export enforce Armenia to look for new geographical and product perspectives in its foreign trade. Our paper aims to estimate trade potential for Armenia by product groups in regional and international directions using gravity approach. Applied gravity model estimates trade flows, which are disaggregated into 7 groups according to BEC's 1-digit classification, between 139 countries during 2003-2007. Our key findings imply that trade relations of Armenia with most of main trade partners have no potential to develop. Armenia has exceeded its export potential almost with all the CIS countries. Trade relations with the EU countries should be re-considered on both product and geographical directions. Re-opening of Armenian-Turkish border could provide significant economic benefit for Armenian exporters. The most perspective product groups of Armenian export seem to be "Industrial supplies", "Food and beverages", and "Consumer goods".

Key words: export, trade balance deficit, gravity equation, trade potential.

Acknowledgements: We would like to express our gratefulness to Oleksandr Shepotylo (Kyiv School of Economics, Kyiv, Ukraine) and Joao M.C. Santos Silva (University of Essex, Colchester, UK) for their constructive comments, discussions and recommendations that substantially improved this paper. We thank Natalia Bystrytska (EERC Program Manager) for support during whole working process.

Grigor Hayrapetyan

PhD, Associate Professor,
Department of International Economics
Faculty of Economics
Yerevan State University
Abovyan Street 52, Yerevan, Armenia, 0025
E-mail: grigor.hayrapetyan@yahoo.com

Viktoriya Hayrapetyan

PhD, Senior Lecturer,
Department of Economics and Finance
Faculty of Economics
Russian-Armenian (Slavonic) University
O. Emin Street 123, Yerevan, Armenia, 0051
E-mail: hayrapetyanv@rambler.ru

CONTENTS

<i>Non-technical summary</i>	4
<i>Introduction</i>	6
<i>Foreign trade of Armenia in a brief</i>	8
<i>Literature review</i>	13
<i>Our approach</i>	16
<i>Data sample</i>	16
<i>Model</i>	19
<i>Estimation strategy</i>	20
<i>Estimation results</i>	24
<i>Interpretations of the results</i>	25
<i>Conclusions</i>	31
<i>Appendices</i>	33
<i>References</i>	46

NON-TECHNICAL SUMMARY

The problem of the trade flows expansion is an urgent topic in the modern economic literature. There are many studies dedicated to reveal the determinants and the perspective directions of the trade flows. In the most part of them the gravity model is used as an empirical tool to model bilateral trade flows and then to estimate trade potentials between countries. Usually the standard set of the gravity equation's determinants is applied, among them there are volume of GDP and number of population (or GDP per capita) in the exporting and importing countries, geographical distance, historical and cultural similarities between them.

Our contribution to the existing literature is to apply the gravity equation to estimate world trade flows and then to use the obtained coefficients to estimate trade potential for Armenia. Considering the policy-making aspects of the topic the results of this research can be interpreted as a base to re-direct Armenian foreign trade policy by encouraging at the official level the trade relations with countries where Armenia has export potential. Armenia's geographical location, the relatively small scale of the economy, as well political and historical peculiarities of the South Caucasian region's development imply that significant economic benefit can be derived from developing stronger links between Armenia and other countries all over the world. It'll allow to expand Armenian foreign economic relations and to implement structural changes both for the entire economic system and foreign trade sphere.

We apply the gravity model to estimate trade flows between 139 countries all over the world for the years 2003-2007. The trade flows data is disaggregated into seven groups according to Broad Economic Categories' 1-digit classification that allows predicting changes in geographical and product compositions of foreign trade flows. Having estimated the gravity model for world bilateral trade flows we proceed to estimate trade potential for Armenia. We calculate export potential as a difference between predicted by the model and actual export volumes. Depending on the value of the export potential we divide Armenia's trade partners into two groups: (i) countries where Armenia has exceeded its trade potential in export (there are 18

countries); and (ii) countries where Armenia has export potential (there are 120 countries, among them 39 countries present the possibility to increase Armenian export more than 3 US\$ millions to each country).

Our key findings imply that the present geographical and product compositions of Armenian export are insufficient: trade relations with the most of the main trade partners, including two neighboring countries – Georgia and Iran, have no potential to develop. As well Armenia has exceeded its export potential almost to all the CIS countries. Current trade relations of Armenia with the EU countries should be re-considered along the lines of advancing of Armenian products to the markets of France, the UK, Spain, Italy, Sweden, Poland, and Greece. Re-opening of the Armenian-Turkish border will present the possibility to increase total Armenian export to Turkey by 40.72 US\$ millions. With regard to product composition of Armenian export the most perspective groups seem to be “Industrial supplies”, “Food and beverages”, and “Consumer goods”.

INTRODUCTION

This paper studies the problems and the prospects of Armenian exports' expansion at the international markets in both geographical and product directions. The unfavorable geopolitical situation in the South Caucasian region and the remnants of the post-soviet heritage has negatively influenced on the development of Armenian economy in a whole and of its foreign trade flows particularly.

The main foreign trade problems that Armenia faces today are the trade balance deficit and the raw-materials export. Under these conditions being a small, landlocked and economically blockaded country and having not sufficient national market in order to provide dynamic economic growth Armenia has to look for new geographical and product perspectives in its foreign trade.

Leading trading partners of Armenia are the EU and the CIS countries. So the most interesting issue in our study is to estimate the export potentials for Armenia with these groups of countries. As well the perspectives of trade relations' enhancement with neighboring countries are of a big interest taking into account the present geopolitical situation of Armenia – economic blockade with two neighbors. Thus there are four main directions of interpretations of the obtained results that are on the agenda in the policy context of our study: trade potentials for Armenia with the EU countries, with the CIS countries, with neighboring countries, and with other countries.

There are many papers that describe the current tendencies of Armenian trade relations' development but it is lack of the studies that would consider the reasons of this phenomenon and try to find the ways to improve Armenian foreign trade compositions in geographical and product directions. There are just a few papers that partly study these issues since they are dedicated to the matters of re-opening of closed border between Armenia and Turkey and to the problems of export diversification of countries' group including Armenia.¹

¹Freinkman et al., 2004; Beilock and Torosyan, 2007; Shepotylo, 2009b.

Our paper aims to estimate the trade potential for Armenia by product groups in regional and international directions using gravity approach. In our research we are going to find the answers the following questions: what countries are the perspective trade partners for Armenia; on which product groups Armenian export flows can be expanded; how trade liberalization between Armenia and Turkey would impact bilateral trade flows in overall and by sectors; whether Armenia has exhausted or unexplored its trade potential with the EU and the CIS countries; is there any possibility to enhance the regional trade flows in the South Caucasian region. Thus the contribution of this paper into existing literature is the estimation of the current Armenian foreign trade flows' product and geographical compositions and the identification of the potential directions of Armenian export's expansion.

Our trade flows data is disaggregated into seven groups according to Broad Economic Categories' 1-digit classification. Using of the disaggregated trade data provides two main results: (i) the list of countries that have potential to expand Armenian export to, (ii) and the list of product groups on which Armenian export should be enhanced. Today Armenia has free trade agreements only with seven countries (the CIS countries). The result of this research can be considered as an empirical platform to develop foreign trade policy of Armenia by enhancing the trade relations with more countries all over the world.

The rest of the paper is organized in the following way. The next section presents the brief description of Armenian foreign trade: policy aspects and current dynamics. Then we review the existing literature on the topic. In the following section we give the econometric specification of applied gravity equation, our data sample, and strategy of estimation. The last sections present the interpretations of the results and the conclusions.

FOREIGN TRADE OF ARMENIA IN A BRIEF

Foreign economic policy of Armenia is based on the liberal principles and directed to the widening of its integration into the world economy². Since 1991 Armenian government has signed bilateral trade and economic agreements with 40 countries all over the world³. As well Armenia has signed the Free Trade Agreements with seven countries, however all of them are the CIS countries; there are Kazakhstan, Georgia⁴, Turkmenistan, Ukraine, Moldova, Kyrgyzstan, and Russian Federation (Appendices Table 1). Since 2003 Armenia is a member of WTO⁵. According to the governments' declarations foreign trade policy of Armenia is directed to the formation of a favorable field for businesses involved in foreign trade and to the stimulation of export of domestic goods. But present situation of Armenian foreign trade witnesses that their efforts are not as successful as it was expected.

The role of Armenia in the world and especially in the regional trade flows is rather modest that is caused by some peculiarities of its historical and economical development. The first is the geopolitical situation that is not favorable for developing regional trade relations. Armenian border is blockaded with two neighboring countries: Azerbaijan and Turkey. The border between Armenia and Azerbaijan was closed in November 1992, when Azerbaijan blocked land communication to Armenia with the start of the conflict over Nagorno-Karabakh (Iskandaryan and Minasyan, 2010).

In 1991 Turkey was one of the first countries to recognize Armenian independence, but the war between Armenia and Azerbaijan over Nagorno-Karabakh prompted Turkey to seal its border with Armenia and withhold normal diplomatic relations (Giragosian, 2009). As well Armenia and Turkey have different opinions concerning the events of 1915: Armenian authorities pursue international recognition of these events as genocide, Turkish officials tend to view the same period as anything but genocide (Giragosian, 2009). Later on the political

²Investment policy and foreign economic cooperation // <http://www.mineconomy.am/ru/14/>

³List of bilateral agreements signed in sphere of trade-economy // <http://www.mineconomy.am/en/14/>

⁴Georgia withdrew from CIS in 2009.

⁵World Trade Organization // www.wto.org

relations between Armenia and Turkey became slowly improving that was connected with the start of the process that is known as “football diplomacy”: in July 2008, Armenian President extended a public invitation to his Turkish counterpart to attend a 2010 World Cup qualifying match between the Armenian and Turkish football teams hosted in the Armenian capital in September 2008 (Giragosian, 2009). After the historic visit, two meetings between Armenian and Turkish officials were held aiming to offer both countries a new opportunity to move forward in seeking to normalize relations (Giragosian, 2009). As a result on October 10, 2009 the governments of the two countries signed two Protocols on the establishment of diplomatic ties and the opening of mutual borders (Iskandaryan and Minasyan, 2010). However these Protocols didn’t come into legal force because they weren’t ratified by countries’ parliaments by political reasons. So in general situation has not been changed and Armenian-Turkish border is closed till the present.

Thus the only land access to and from Armenia is via Georgia and Iran. Iran is under embargo by most of the rest of the world. Transport through Georgia a few years ago was associated with bribery, restricted travel time, insecurity, and the poor quality of roads and railways. Because of this situation trucking companies based in Armenia couldn’t transport goods competitively to the Black Sea or to Russia (Polyakov, 2002). Now-a-days transport infrastructure, the legal environment and level of development are changing rapidly. Roads are already dramatically better than they were a few years ago.⁶ At the same time Iranian and Georgian routes are very expansive. Mediterranean seaports are of greater interest for Armenia than those of the Black Sea. The Black Sea ports do not allow the use of ocean container carriers. This is the reason that, for instance, the cost of freight forwarding from Poti to Marseille is 700-800 USD per container, and from Beirut to Marseille is 100 USD, since in the latter case ocean ships are used, that have a large capacity and therefore a low cargo transportation cost price.⁷

⁶ Study of Economic Relations between Georgia and Armenia: The Development of Regional Trade Related Growth in Samtskhe-Javakheti. CRRC-Georgia. August - September 2007.

⁷ Doing Business in Armenia and Turkey, CSERA, June 2009.

The second peculiarity causing the present economic situation in Armenia is a post-soviet heritage. As other soviet republics Armenia was deeply integrated into the common economic mechanism of USSR. Under the command economy trade patterns were to a large extent determined not by the market forces but by planning authorities (Shepotylo, 2009b). After collapse of USSR all economic ties between Armenia and other republics were broken that was caused by the role played by big industrial plants that produced mostly intermediary goods, with both suppliers and customers located in the rest of the former Soviet Union republics.

Taking into account all mentioned above we can characterize Armenia as a small, landlocked and economically blockaded country, which faces high transportation costs that impede to export of manufacturing goods, food, light industrial machinery, rubber, chemicals and electronics (these products were the main titles of export from Armenia to other Soviet republics). Now-a-days Armenia is developing niche markets in lightweight products with low transportation costs and highly skilled labor inputs (such as processed diamonds, precious stones, and computer software) which can be easily airlifted.

Since achieving macroeconomic stabilization in 1995 Armenia has demonstrated good economic results: economic growth averaged about 12% over the years 2001–2008 and recorded almost 6.8% in 2008 that was stipulated by financial crisis⁸.

The volumes of Armenian foreign trade have been growing as well. For period 1997-2007 export increased about 5 times and import – about 3.5 times, the share of Armenia in the world trade grew about 2 times in export and 1.5 times in import⁹. Trade turnover for the years 1997-2007 grew almost 4 times (Figure 1).

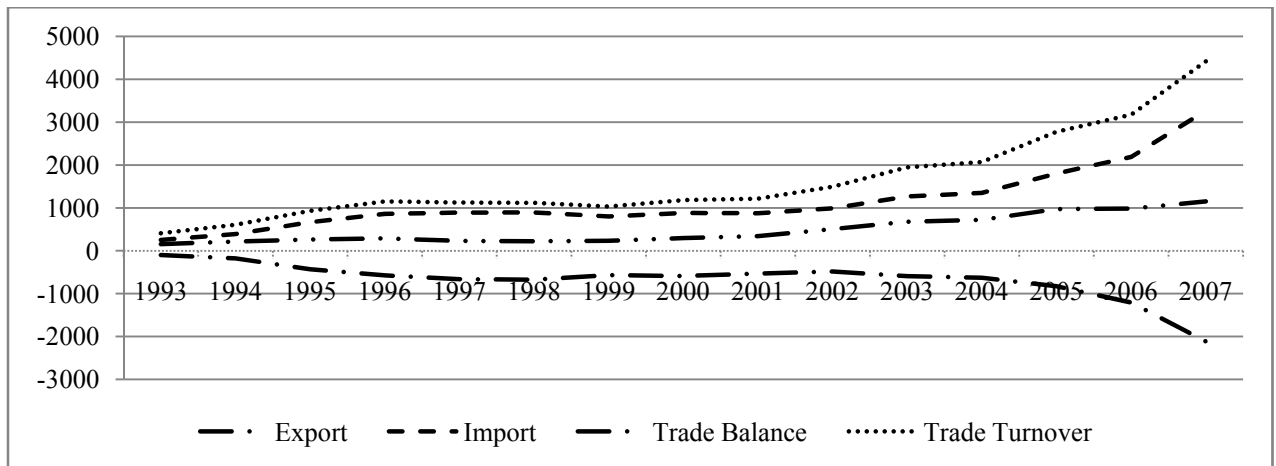
At the same time the trade balance deficit has been stably increasing: in 2007 it was 3.2 times higher than it had been in 1997. Trade to GDP ratio amounted about 49% in 2007 (mostly due to huge volumes of import) but the average value for “Low & middle income countries”

⁸Statistical Yearbook of the Republic of Armenia, 2008 // www.armstat.am

⁹ But in the global terms it is still very small – in 2007 the share of Armenia amounted about 0.01% of world export and 0.022% of world import (*source for calculations*: database “World Development Indicators 2008”).

(Armenia belongs to this group according to World Bank classification) was about 57%. Thus Armenia has some “reserves” for increasing its trade flows especially export.

Figure 1: Dynamics of Armenian Foreign Trade Flows (millions US dollars)¹⁰



In 2007 the leading directions of Armenian export were Russian Federation, Germany, Netherlands, Belgium and Georgia (Table 1).

Table 1: Geographical Composition of Armenian Foreign Trade (2007)¹¹

<i>EXPORT</i>			<i>IMPORT</i>		
<i>Country</i>	<i>Share (%)</i>		<i>Country</i>	<i>Share (%)</i>	
1	Russia	17.5	1	Russia	22.0
2	Germany	14.7	2	Ukraine	7.7
3	Netherlands	13.5	3	Kazakhstan	7.4
4	Belgium	8.7	4	Germany	6.8
5	Georgia	7.6	5	China	6.0
6	USA	4.5	6	France	4.6
7	Switzerland	4.3	7	USA	4.4
8	Bulgaria	4.1	8	Iran	4.3
9	Ukraine	4.0	9	Turkey	4.0
10	Iran	3.3	10	Austria	3.8
<i>Above 10</i>		<i>82.2</i>	<i>Above 10</i>		<i>71.0</i>

The product composition of Armenian trade flows shows that mainly Armenia provides to these countries raw materials or products with low added value (Table 2). The only exception is Armenian export to Russian markets; final products here amount about 60 per cent.

Armenian foreign trade geographical direction has changed several times. It can be divided into three phases: (i) 1991-1998 - the main trading partners were the CIS countries; (ii) 1998-

¹⁰ Statistical Yearbook of the Republic of Armenia, 2008 // www.armstat.am

¹¹ Statistical Yearbook of the Republic of Armenia, 2008 // www.armstat.am

2002 - the share of the CIS countries was declining in the favor of the EU countries; (iii) 2002-2007 - increasing of trade flows with the CIS and the EU countries. In 2007 the share of both the EU and the CIS countries came up 70% of total Armenian trade turnover (Appendices Figure 1).

Table 2: Product Composition of Armenian Export (top-5 directions) (2007)¹²

Product group	Share, %	Product group	Share, %
<i>Russian Federation</i>	<i>100</i>	<i>Germany</i>	<i>100</i>
Alcoholic and non-alcoholic beverages and vinegar	58.3	Iron and steel	43.6
Pearls, precious stones, metals, coins	15.5	Copper and articles thereof	34.4
Electrical machinery, equipment	4.0	Non-precious metals and articles thereof	10.7
<i>Netherlands</i>	<i>100</i>	<i>Georgia</i>	<i>100</i>
Iron and steel	96.7	Building materials	46.7
<i>Belgium</i>	<i>100</i>	Coffee, tea and other spices	14.7
Pearls, precious stones, metals, coins	93.3	Glass and glassware	9.7

Since 1998 till present one of the main trade partners of Armenia is the EU countries. After enlargement of the European Union on 1 May 2004 significant shifts were broken in the relationships between the EU and Armenia in political, geographic and economic terms. Most important event became the implementation of the European Neighborhood Policy of the European Union that sets ambitious objectives based on commitments to shared values and effective implementation of political, economic and institutional reforms¹³. The European Neighborhood Policy partners are expected to benefit from closer cooperation with the EU, the chance to participate in EU programmes and a stake in the EU's internal market, which will strongly support their own political and economic reforms. Further for enhancing the EU relationship with Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine on 7 May 2009 the Eastern Partnership was inaugurated. This would imply new association agreements

¹²Statistical Yearbook of the Republic of Armenia, 2008 // www.armstat.am

¹³European Neighborhood and Partnership Instrument. Armenia. Country Strategy Paper 2007-2013; EU / Armenia Action Plan

including deep and comprehensive free trade agreements with those countries willing and able to enter into a deeper engagement and gradual integration in the EU economy¹⁴.

As we mentioned above Armenia has a good legal platform for enhancing trade relations with the CIS countries: all free trade agreements of Armenia are signed only with the CIS countries. As well Russian Federation, being an economical and political leader of the CIS, is a main trade partner of Armenia on both export and import.

Current trade relations of Armenia only with two neighboring countries – Georgia and Iran – can be called positively developing. These countries are in the top-10 Armenian trade partners. As we pointed out there are no official political and economical relations of Armenia with Turkey and Azerbaijan. As international practice witnesses the easiest market access for most finished goods is in countries that geography puts nearby; but history, political unfriendship, colonial rules and a host of other reasons might have prevented to seize this natural advantage (Piana, 2006). This situation took place between Armenia with Turkey and Azerbaijan.

All mentioned above brings up the urgency of our research. The issue of re-orientation of Armenian trade flows at the regional and international frameworks is on the agenda. Armenia needs to enhance its volumes of trade with more number of countries all over the world.

LITERATURE REVIEW

The problem of the trade flows expansion is an urgent topic in the modern economic literature. There are many studies dedicated to reveal the determinants and the perspective directions of the trade flows between countries. In the most part of them the gravity model is used as an empirical tool to model bilateral trade flows and then to estimate trade potentials between countries or traded blocks.¹⁵

The gravity equation, based on the Newton's physics function that describes the force of gravity, firstly was applied in economics for analyzing bilateral trade flows between

¹⁴ Eastern Partnership // http://ec.europa.eu/external_relations/eastern/index_en.htm

¹⁵ Baldwin, 1993; Paas, 2000, 2003; Rahman, 2003; Baxter and Kouparitsas, 2005; Sohn, 2005; Maryanchyk, 2005; Bhattacharyya and Banerjee, 2006; DeRosa et al., 2008.

geographical entities in the studies of Tinbergen (1962) and Poyhonen (1963). Since that many papers were dedicated to ground the applying of gravity equation for trade flows' estimation by deriving it from different economic models (e.g. Anderson, 1979; Bergstrand, 1985; Deardorff, 1998; Evenett and Keller, 1998; Harrigan, 2001; Hanson and Xiang, 2002; Shepotylo, 2009b). Discussing gravity model popularity in the empirical studies Deardorff (1998) noted that the gravity equation's empirical success is not evidence of anything, but just a fact of life. Eichengreen and Irwin (1997) characterized the gravity model in international trade as "the workhorse for empirical studies".

In the standard gravity equation, trade flows are expected to be dependent negatively on distance and positively on the sizes of the economies measured by GDP. Linnemann (1966) added population as an additional measure of country's size. In some recent studies GDP per capita is included instead of GDP and population number. It's caused by two reasons: (i) usually in the process of estimation the gravity model is log-linearized thus including the log of GDP and log of population separately is equivalent to including the log of GDP per capita with a restriction on the estimated coefficients of GDP and population separately; (ii) population's effect is positive sometimes and negative other times, so the population term is included in the model to control for country size but often ignored in the analysis (Armstrong, 2007).

Mainly studies include the standard set of the gravity equation's determinants such as volume of GDP and number of population (or GDP per capita) in the exporting and importing countries, geographical distance, historical and cultural similarities between them (e.g. DeRosa et al., 2008; Jošić M., 2008). Some authors augmented the gravity model with variables describing exchange rate regimes, scale of factor endowments, level of development (e.g. Frankel, 1997; Frankel and Wei, 1993; Baxter and Kouparitsas, 2005; Klein and Shambaugh, 2004), as well technological innovation and transport infrastructure variables (e.g. Martínez-Zarzoso and Márquez-Ramos, 2005). A lot of studies include the variables characterizing the presence of preferential and free trade agreements between countries that allows estimating their impact on

the bilateral trade flows (e.g. Batra, 2004; Frankel, 1997; Frankel and Wei, 1993; Maryanchyk, 2005; Paas, 2000). Some papers consider the trade flows between trading blocs (e.g. Wang and Winters, 1991; Baldwin, 1993; Martínez-Zarzoz and Nowak-Lehmann, 2003). Many recent studies explore gravity model for further estimating trade potentials, a lot of them consider the speedily growing developing economies (e.g. Batra, 2004; Bhattacharyya, 2006; Rahman, 2003; Sohn, 2005). For countries with transition economies the problem of the trade potentials' prediction is on the agenda as well (Paas, 2000; Maryanchyk, 2005; Shepotylo, 2009b).

The problems of Armenian foreign trade development are discussed among Armenian and foreign researchers. In general all papers present the descriptive analysis of the foreign trade of Armenia or different aspects of Armenian foreign economic relations (Polyakov et al., 2002; Mitra et al., 2006). There are just a few papers in which authors apply the gravity model for analyzing foreign trade of Armenia.

Freinkman et al. (2004) use in their work the gravity model coefficients obtained by Frankel (1997)¹⁶ and then estimate the 2001 realization ratios for all the CIS countries based on the value for the CIS dummy coefficient equal to 1.766 (identical to the one for the ASEAN block, obtained in the work of Frankel (1997)). Their main finding is that Armenia had been lagging in its export development relative to most CIS countries.

Beilock and Torosyan (2007) in their paper discuss possible strategies for and the potential economic effect from opening the borders between Armenia and Turkey. The authors use the gravity model to estimate changes in trade volumes between Armenia and Turkey from border opening; they estimate the sample including transition countries, developed European countries, Turkey, and Israel for the year 1999 and then the results are used to predict trade volumes between Armenia and Turkey in 2004. Number of observations was 493 for imports into transition economies and 491 for exports from transition economies. With an open border the border dummy was equal to 1. The authors find that there is significant unused trade potential

¹⁶Their model includes such variables as nominal Gross National Product, nominal per-capita GNP, distance, adjacency dummy, language dummy, and bloc dummy; is based on 63 countries (excluding CIS countries) and use the 1992 data.

between Armenia and Turkey due to the closed border: with an open border the volume of Turkish imports will be \$51.0 million; Armenian exports to Turkey is expected to go up \$5.0 million.

Shepotylo (2009b) develops the gravity model of trade at industry level and employs it in order to compare the degree of export diversification of the CIS countries relative to other countries. Author estimates the developed gravity equation with "out-of-sample" approach for 10 industries on the sample of 126 source countries and 157 destination countries in 2000-2006. Then using the sample of the CIS countries author predicts the probability of positive trade of each CIS country. The results for Armenia show that Armenian trade below its potential, while other CIS countries have more complex patterns.

OUR APPROACH

DATA SAMPLE

Our analysis is based on the maximum possible geographical coverage of the world trade flows for the years 2003-2007¹⁷ and includes 139 countries (Appendices Table 2).

The dependent variable is foreign trade flows between two trading countries; the independent variables are the following determinants: GDP per capita in exporting country and GDP per capita in importing country; distance between trading countries; presence of common border / common language / colonial ties between trading countries; whether one/both of trading countries is/are landlocked; membership in WTO; membership in traded blocks. The list of variables and their descriptive statistics are given in the Appendices Table 3 and Table 4.

The main data source for bilateral trade flows is the database of the UN Commodity Trade Statistics Database (Comtrade)¹⁸. The product classification of our trade data is based on the Broad Economic Categories' (BEC) 1-digit classification with the products being disaggregated into seven groups: 1)Food and beverages; 2)Industrial supplies; 3)Fuels and lubricants; 4)Capital

¹⁷ We don't take the years 2008-2009 in order to avoid the possible fluctuations that are caused by the recent financial crisis.

¹⁸ UN Commodity Trade Statistics Database // <http://comtrade.un.org/>

goods (except transport equipment), including accessories and parts; 5)Transport equipment, including accessories and parts; 6)Consumer goods; and 7)Goods (not elsewhere classified). Applying the disaggregated trade data allows to predict changes in the composition of trade at the level of sectors of the economy that is essential for evaluating the effect of policy changes on trade and development (Shepotylo, 2009b).

In recent years, it has become widely recognized that trade data even in the aggregate level between any two countries is frequently zero. Some of the reports of zero trade reflect errors and omissions and, rarely, rounding error because the value of trade reported is too low to record. However, it appears that most of the zero trade flows between country pairs reflect a true absence of trade, rather than rounding error. Since Tobin's (1958) famous paper, it has been known that the presence of zero values of the dependent variable in a sample has potentially very important implications for the parameter values estimated using these data (Martin and Pham, 2007).

So in the bilateral international trade matrix zero trade flows are common. Haveman and Hummels (2004) found that nearly 1/3 of the bilateral trade matrix is empty. Helpman, Melitz and Rubinstein (2008) found that about half of the country pairs in their 158 country sample do not trade with each other at all. Shepotylo (2009a) revealed that almost 1/2 of the possible 934,700 bilateral trade matrix is empty. With product disaggregation, we can expect the problem to become more and more serious. Dropping zeros means that we may lose potentially useful information and we may get biased estimates of the coefficients we are primarily interested in.

In our database number of zeros for total export accounts 21.8%, for export of Food and beverages goods – 41.8%, for export of Industrial supplies goods – 30.8%, for export of Fuels and lubricants goods – 67.5%, for export of Capital goods – 39.0%, for export of Transport equipment – 49.5%, for export of Consumer goods – 36.2% and for export of Goods (not elsewhere classified) – 60.8%.

For the variable GDP per capita as a data source we use database “World Development Indicators 2008”. We consider this variable as a size of economy. Countries with higher GDP per capita may have possibility to trade more than countries with lower GDP per capita.

As a source for the data of the geographical distance between trading countries and the dummy variable Landlocked we take the CEPII database¹⁹. Distance negatively influences on bilateral trade flows. Greater distance between two countries may provide greater transportation costs for trade flows and it's also possible that the greater geographical distance is correlated with the larger cultural differences. The dummy variable Landlocked captures the presence of outlet to the seacoast in the exporting and importing countries. If one/both of the countries is/are landlocked it negatively influences on bilateral trade flows. It increases the cost of trade as trade flows are limited in the choice of transportation. Taking into account that mostly international trade flows are carried by sea transport we assume that landlocked countries have some constraints in trade flows (especially higher transportation costs).

For the data of the dummy variables describing the cultural and historical similarities between two countries (Common border, Common language, and Colonial ties) as a source we use the CEPII database as well. We assume that countries with larger cultural similarities tend to trade more than countries with smaller or without cultural similarities. Presences of common border / common language / colonial ties positively influence on bilateral trade flows. It witnesses the long historical, cultural, economical and political relations between trading countries both at the interstate and inter-firm levels that may lead to the decreasing of the transaction costs. For example, common language is expected to reduce transaction costs in international trade as speaking the same language will simplify and promote trade negotiations. Similarly colonial ties provide shared history for countries and this is expected to reduce transaction costs caused by cultural differences.

¹⁹ CEPII // www.cepii.fr

As a source for data of the dummy variables describing the membership in WTO of exporting and/or importing countries we use the WTO database²⁰. There are two dummy variables: WTOboth and WTOnone. The variable WTOboth equal 1 if two countries are the members of WTO; and the variable WTOnone is equal 1 if none of trading countries is a member of WTO. WTO membership positively influences on bilateral trade flows. Taking into account the fact that trade policy is more liberal in the countries that are WTO members than in non-members we assume that bilateral trade flows between WTO members will be greater than between non-members.

For data of the dummy variable characterizing the presence of the free trade agreements between trading countries as a source the database of UN Economic and Social Commission for Asia and the Pacific serves²¹. Membership in traded blocks positively influences on bilateral trade flows. Countries join traded blocks aiming to simplify and expand their trade relations.

MODEL

In our study we apply gravity equation to estimate the bilateral trade flows. The standard gravity equation in the economic interpretation looks as:

$$Y_{ij} = \alpha X_i^{\beta_1} X_j^{\beta_2} D_{ij}^{\beta_3} \quad (1)$$

where: Y_{ij} – trade flows (export) between country i and country j ;
 X_i and X_j – economic “masses” of the considered countries (GDP per capita);
 D_{ij} – distance between country i and country j ;
 α - constant of proportionality; $\beta_1, \beta_2, \beta_3$ - coefficients.

Usually the augmented gravity model that includes additional variables which allow presenting more precise picture of the considered phenomena is applied. We consider AV_{ij} as a vector of additional variables. According to the list of the determinants of the bilateral trade flows mentioned in the previous section vector of additional variables include such determinants as presence of common border / common language / colonial ties between trading countries; whether one/both of trading countries is/are landlocked; membership in WTO; membership in

²⁰ World Trade Organization // www.wto.org

²¹ UN Economic and Social Commission for Asia and the Pacific // www.unescap.org/tid/rta.asp

traded blocks. Thus, the augmented gravity equation to model bilateral trade flows looks as:

$$Y_{ij} = \alpha X_i^{\beta_1} X_j^{\beta_2} D_{ij}^{\beta_3} AV_{ij}^{\gamma} \quad (2)$$

where: AV_{ij} is a vector of additional variables that influence on bilateral trade flows.

The specification of the *augmented gravity equation to model bilateral trade flows* in the log-form that to be estimated looks as:

$$\ln Y_{ij} = \alpha + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln Dist_{ij} + \gamma AV_{ij} + u \quad (3)$$

where: Y_{ij} - trade flows (export) between country i and country j,
 GDP_i and GDP_j - GDP per capita in country i and country j, respectively;
 $Dist_{ij}$ - distance between country i and country j;
 AV_{ij} - vector of additional variables;
 u - disturbance term.

ESTIMATION STRATEGY

We estimate the gravity model (3) for panel data for the years 2003-2007. Descriptive statistics of the variables is presented in Table 4 of Appendices.

The estimator choice is an important issue for the interpretation of the coefficients, which depends on the underlying interests. Different estimators not only give different parameter estimates but also different residuals, i.e. actual-to-potential trade ratios (Egger, 2001).

Early empirical studies used cross-section data to estimate a gravity model; in most recent years, researchers use panel data. The use of panel data instead of cross-sectional analysis allows us to remove some biases stemming from unobserved industry and country-pair heterogeneity and to estimate the parameters of the model with greater precision (Shepotylo, 2009b).

Gravity model (3) suffers from an omitted variable bias. According to Anderson and van Wincoop (2004) commonly used remoteness variable distance does not capture the entire range of factors which impact bilateral trade flows. To overcome this problem they offer to take into account “multilateral resistance” terms. These multilateral resistance terms consist of country specific price indices. Since the multilateral resistance terms as proposed by Anderson and van Wincoop (2004) are not observables, the authors propose among others the simultaneous use of both importer and exporter fixed effects to replace the resistance terms (Helmets and Pasteels,

2005). In order to capture “multilateral resistance” terms we will use importer and exporter fixed effects in gravity model (3).

Along the years two main strategies have been selected in order to calculate trade potentials. The first one derives out-of-sample trade potential estimates i.e. the parameters for EU (or OECD) countries are estimated by a gravity model and then the same coefficients are applied to project “natural” trade relations between EU countries and CEECs. The difference between the observed and predicted trade flows should represent the unexhausted trade potential. The second strategy derives in-sample trade potential estimates i.e. CEECs are included in the regression analysis and the residuals of the estimated equation should represent the difference between potential and actual trade relations (Benedictis and Vicarelli, 2004). Egger (2002) argues forcefully that in-sample estimations of the trade potential based on the deviation of residuals from the linear prediction are incorrect because large deviations of residuals in the gravity equation based on the method are not evidence of large deviations of trade from its potential, but rather an indicator of model misspecification (Shepotylo, 2009b).

The problem that we face is if we use out-of-sample approach we can't use Anderson and van Wincoop (2004) “multilateral resistance” terms (importer and exporter fixed effects) while estimating total trade potential. In case of out-of-sample approach we could include only importer fixed effects if we try to estimate export potential and we could include only exporter fixed effects if we try to estimate import potential.

We estimated our model with in-sample and out-of-sample approaches and found that the results of in-sample and out-of-sample approaches are very close (almost the same coefficients). We chose in-sample approach which allows us to take both importer and exporter fixed effects. So our final results are based on in-sample approach.²²

Recently Helpman, Melitz and Rubinstein (2008) presented a theoretical framework to analyze bilateral trade flows. This model has a number of implications for trade flows. The

²² Results of the out-of-sample approach are not reported here, but are available upon request from the authors.

model is able to predict zero exports from j to i for some country pairs. As a result, the model is consistent with zero trade flows in both directions between some countries, as well as zero exports from j to i but positive exports from i to j for some country pairs. Second, the model predicts positive - though asymmetric - trade flows in both directions for some country pairs, which are also needed to explain the data. And finally, the model generates a gravity equation (Helpman, Melitz and Rubinstein, 2008). The authors propose a two stage estimation procedure. The first stage consists of estimating a Probit equation that specifies the probability that country j exports to country i as a function of observable variables (extensive margin). Predicted components of this equation are then used in the second stage to estimate the gravity equation in log-linear form (intensive margin).

In Appendices Table 5 we present the results of Helpman, Melitz and Rubinstein (2008) model by total export and by BEC's 1-digit classification product groups which are based on NLS estimation (Helpman, Melitz and Rubinstein, 2008; p.462). Then in this Table we also present polynomial approximation for total export and for each product group. Taking into account that in case of polynomial approximation nonlinearity eliminates, we estimate the second stage using OLS estimation (Helpman, Melitz and Rubinstein, 2008; p.464). Both NLS and OLS estimates are based on two stage estimation where the first stage Probit remains unchanged. Unlike Helpman, Melitz and Rubinstein (2008; p.465) we found that in HMR model OLS estimation results are not very similar to NLS estimates²³. Taking into account that we found a big difference between NLS and OLS estimation results in HMR model we can state that HMR model is not appropriate for our panel export data. We have experimented to estimate HMR model with 2007 cross sectional export data and there also found big differences between NLS and OLS estimation results for total export and export by product groups.²⁴

²³ We also estimated HMR model by adding two additional dummy variables: both countries are WTO members and none of countries is WTO member. Here also we got a big difference in NLS and OLS results. These results are not reported here, but are available upon request from the authors.

²⁴ Results of cross sectional export data are not reported here, but are available upon request from the authors.

According to recent work of Santos Silva and Tenreyro (2009b) though HMR's model makes a significant step towards a better understanding of the determinants of bilateral trade flows, the proposed two-stage non-linear least squares estimation procedure has some limitations. First, the approach used by HMR to deal with the selectivity bias is only approximately correct and, consequently, the proposed estimator is not generally consistent for the parameters of interest. Second, HMR obtain their model under very strong distributional assumptions. All the results presented in their paper depend critically on the untested assumption that all random components of the model are homoskedastic (Santos Silva and Tenreyro, 2009b).

Santos Silva and Tenreyro (2006) found that the standard empirical methods used to estimate gravity equations are inappropriate. The basic problem is that log-linearization (or, indeed, any non-linear transformation) of the empirical model in the presence of heteroskedasticity leads to inconsistent estimates. Authors propose a simple Poisson pseudo maximum likelihood method which is robust to different patterns of heteroskedasticity and, in addition, provides a natural way to deal with zeroes in data.

The existence of the maximum likelihood estimates for Poisson regression depends on the data configuration. Because standard software does not check for this problem in some applications estimation of the Poisson regression is unusually difficult or even impossible. Especially the non existence of the (pseudo) maximum likelihood estimates of the Poisson regression models is more likely when the data has a large number of zeros (Santos Silva and Tenreyro, 2009a). To overcome this problem we can use the strategy that Santos Silva and Tenreyro (2009a) described in their recent work. Rather than using the poisson command we used the PPML command for Stata which is written by them and by-passes most of these problems.²⁵

²⁵<http://privatewww.essex.ac.uk/~jmcss/LGW.html>

Taking into account the above mentioned our final results for trade potentials' calculation is based on Poisson model estimation²⁶. Also we use in-sample approach and importer, exporter, and time fixed effects.

ESTIMATION RESULTS

In Table 3 we present the estimation results for total export and for export on product groups. According to the results the determinants “Distance”, “Importer’s GDP per capita” and “Exporter’s GDP per capita” mostly have expected signs and are highly statistically significant providing evidence for the predictions of the gravity equation. The other variables (dummy variables) as well mostly have expected signs and are highly statistically significant.

Table 3: Results of Gravity Model Estimation by Poisson Model²⁷

	Total	Food & Beverages	Industrial Supplies	Fuels & Lubricants	Capital Goods	Transport Equipment	Consumer Goods	Goods (not classified)
LnGDPexp	1.18*** (0.16)	0.90*** (3.78)	1.05*** (0.22)	1.05*** (0.37)	1.64*** (0.19)	2.15*** (0.24)	0.82*** (0.21)	-1.06** (0.44)
LnGDPimp	0.84*** (0.22)	0.80*** (4.25)	0.53* (0.29)	0.14 (0.44)	0.82*** (0.24)	2.41*** (0.25)	0.97*** (0.31)	1.45*** (0.31)
LnDistance	-0.74*** (0.03)	-0.87*** (-26.03)	-0.80*** (0.03)	-1.24*** (0.06)	-0.65*** (0.03)	-0.66*** (0.04)	-0.73*** (0.04)	-0.89*** (0.05)
Common Language	0.22*** (0.08)	0.27*** (2.67)	0.11 (0.10)	0.36** (0.18)	0.26*** (0.09)	0.17 (0.11)	0.36*** (0.11)	0.22 (0.14)
Common Border	0.52*** (0.08)	0.66*** (6.35)	0.53*** (0.08)	0.63*** (0.14)	0.51*** (0.12)	0.56*** (0.11)	0.44*** (0.09)	0.26** (0.12)
Colony	0.14 (0.11)	0.40*** (3.31)	0.34*** (0.11)	0.30 (0.19)	0.09 (0.11)	-0.26 (0.16)	0.18 (0.13)	0.55*** (0.14)
Landlocked	-1.68*** (0.86)	-2.47*** (-3.14)	-0.85 (1.07)	1.42 (1.82)	-1.21 (0.98)	-6.37*** (1.04)	-2.55** (1.19)	-2.59** (1.13)
FTA	0.39*** (0.08)	0.17 (1.54)	0.35*** (0.08)	0.03 (0.19)	0.38*** (0.10)	0.75*** (0.13)	0.28*** (0.10)	0.76*** (0.17)
Logpseudo likelihood	-97672022	-9139455.9	-29977121	-32672812	-23610037	-15929582	-15065213	-6416445.3
Obs Number	82750	82750	82750	82750	82750	82198	82750	82612

Constant term, exporter country, importer country, and time fixed effects are included but not reported. Standard errors, clustered by country pair, are presented in parentheses, ***, **, and * denote 1%, 5%, and 10% significance levels, respectively.

²⁶ For our dataset we used PPML command for Stata which is written by Santos Silva and Tenreyro and estimates Poisson regression by pseudo maximum likelihood.

²⁷ Results are calculated with PPML command for Stata which is written by Santos Silva and Tenreyro and estimates Poisson regression by pseudo maximum likelihood.

Having estimated the gravity model for world bilateral trade flows (panel data for the years 2003- 2007) we proceed to estimate trade (export) potential for Armenia. We calculate export potential as a difference between predicted by the model and actual export volumes. Depending on the value of the export potentials we divide Armenia's trade partners into two groups: (1) countries where Armenia has exceeded its trade potential in export; and (2) countries where Armenia has export potential (Appendices Tables 6-7, Figures 2-4).

Results show that Armenia has potential to expand its export to 120 countries all over the world, among them 39 countries present the possibility to increase Armenian export more than 3 US\$ millions to each country; and Armenia has exceeded its export potential with 18 countries.

Countries where Armenia has the maximal potential for export expansion are USA, Turkey, Japan, China, France, UK, Spain, Italy, Hong Kong, Saudi Arabia, India, Sweden, Korea, Singapore, Mexico, UAE, Poland, Australia, Greece, and Azerbaijan. Totally these countries present the possibility to increase the export volumes of Armenia by 359 US\$ millions. Countries where Armenia has maximally exhausted its export potential are Belgium, Israel, Russia, Netherlands, Germany, Switzerland, Georgia, Ukraine, Bulgaria, and Iran.

INTERPRETATIONS OF THE RESULTS

We interpret the obtained results accordingly to the policy context of our study and present them on four directions:

- trade potential for Armenia with the EU countries,
- trade potential for Armenia with the CIS countries,
- trade potential for Armenia with neighboring countries,
- trade potential for Armenia with other countries.

All further analysis is based on the data given in Table 4 if other is not pointed out. Speaking about export potential we mean averaged values for the years 2003-2007, if other is not

pointed out (Table 4; Appendices Figure 2-4). All given product compositions of Armenian export to different countries are based on Harmonized System 2-digit classification trade data²⁸.

Trade potential for Armenia with the EU countries:

Belgium, Netherlands, Germany, and Bulgaria are the EU countries that are in the 10-top directions of Armenian export. Thus we accent the trade relations of Armenia with these EU countries. The Table 4 shows that the export potentials for Armenia with these countries are extremely exhausted (Belgium – (-102.12 US\$ millions), Netherlands - (-74.22 US\$ millions), Germany - (-70.86 US\$ millions), and Bulgaria - (-8.42 US\$ millions)).

Analyzing the trends of Armenian export potentials to these countries for the years 2003-2007 we observe that exceeding of Armenian export potentials is decreasing with Belgium, with the rest of the mentioned countries it is increasing (Appendices Tables 6-7).

In this context the important issue is the analysis of the product compositions of Armenian export to these countries. Armenian producers supply to their markets, as well to Switzerland's and Israel's markets (Armenian export potentials to them are also exceeded) mainly a few product groups that include the raw materials or the products with low added value: (i) "Iron and steel", "Copper and articles thereof", and "Other base metals, cermets, articles thereof" – to Netherlands and Germany; (ii) "Pearls, precious stones, metals, coins" - to Belgium and Israel; (iii) "Ores, slag and ash" - to Bulgaria and Switzerland.

Studying Armenia's export potentials on other product groups we observe that exports of "Food and beverages" and "Consumer goods" have potentials to increase, at that the goods from these product groups provide a significant added value into national economy. The total Armenian export potential of "Food and beverages" to Belgium, Netherlands, Germany, Switzerland, and Israel amounts 8.33 US\$ millions, export potential of "Consumer goods" to Belgium, Netherlands, Germany, Bulgaria and Israel is about 6.35 US\$ millions.

²⁸ International Trade Center // www.intracen.org

Table 4: Trade Potentials for Armenia, US\$ millions (averages for the years 2003-2007)

Country	Total	Food & Beverages	Industrial Supplies	Fuels & Lubricants	Capital Goods	Transport Equipment	Consumer Goods	Goods (not classified)	
<i>Countries where Armenia has the Maximal Potential to Expand Export</i>									
1	USA	54.84	2.79	28.19	1.92	3.03	0.46	-14.38	0.00
2	Turkey	40.72	3.09	50.36	1.08	0.91	0.12	1.97	0.01
3	Japan	36.17	6.09	21.95	1.82	0.98	0.09	2.41	0.00
4	China	32.10	3.61	35.75	0.53	0.11	0.03	0.58	0.00
5	France	24.13	1.98	16.04	0.47	-0.70	0.13	2.43	0.00
6	UK	22.48	3.82	8.85	0.57	0.77	0.10	3.08	-0.01
7	Spain	16.10	2.42	7.56	0.35	0.68	0.13	2.35	0.00
8	Italy	15.94	6.02	31.04	0.99	0.62	0.15	-20.01	0.01
9	HongKong	14.25	0.94	10.83	0.11	0.92	0.02	0.31	0.00
10	SaudiArabia	12.17	3.30	8.97	0.01	0.30	0.07	1.08	0.00
11	India	11.67	1.04	15.95	0.40	0.35	0.02	0.19	0.00
12	Sweden	11.24	1.32	7.48	0.10	0.36	0.05	1.08	0.00
13	Korea	10.65	1.16	10.20	0.50	0.44	0.02	0.25	0.00
14	Singapore	9.20	0.45	4.57	0.18	0.50	0.02	0.34	0.00
15	Mexico	8.80	0.77	6.52	0.07	0.37	0.03	0.58	0.00
16	UAE	8.35	2.30	7.09	0.04	-0.42	-0.15	1.01	0.00
17	Poland	7.96	0.97	6.05	0.14	0.28	0.04	0.91	0.00
18	Australia	7.89	0.53	4.47	0.14	0.25	0.04	0.78	0.00
19	Greece	7.33	1.71	4.84	0.14	-0.75	0.03	1.11	0.00
20	Azerbaijan	6.84	1.87	5.46	0.03	0.21	0.04	0.67	0.00
<i>Countries where Armenia has Maximally Exceeded its Export Potential</i>									
1	Belgium	-102.1	0.99	-101.68	0.13	0.17	-0.05	0.62	0.00
2	Israel	-86.8	0.95	-83.53	0.10	0.24	0.03	0.29	0.00
3	Russia	-80.5	-65.89	1.54	0.09	-9.16	-0.64	-2.44	-0.03
4	Netherlands	-74.2	2.53	-80.88	0.67	0.60	-0.02	1.59	0.00
5	Germany	-70.8	3.35	-85.63	0.45	1.25	-0.19	3.73	-0.05
6	Switzerland	-37.9	0.51	-36.75	0.21	0.16	0.02	-0.59	0.00
7	Georgia	-29.5	-5.24	-13.11	-6.17	-1.36	-0.51	-0.59	0.00
8	Ukraine	-10.7	-7.36	-2.31	0.11	-2.29	-0.33	0.63	0.00
9	Bulgaria	-8.4	-0.07	-8.27	0.07	0.02	0.01	0.12	0.00
10	Iran	-5.8	3.76	6.63	-7.67	-1.50	-0.20	0.68	0.00

Looking through the countries with maximal potential to expand Armenian export we see among them France (export potential is 24.13 US\$ million), the UK (22.48 US\$ million), Spain (16.10 US\$ million), Italy (15.94 US\$ million), Sweden (11.24 US\$ million), Poland (7.96 US\$ million), and Greece (7.33 US\$ million). In a general according to our results the product group with maximal export potential to these countries is “Industrial supplies”.

Totally the EU countries those having the potentials present the possibility to increase Armenian export by 161.36 US\$ million (Appendices Figures 2-3). But accounting that Armenia has exceeded its trade potential with Belgium, Netherlands, Germany, and Bulgaria by 255.62 US\$ millions we see that in a whole Armenian export to the EU countries is exceeded.

Summarizing we have to note that Armenia over-exports to the EU countries, especially the raw materials, and thus Armenian government should make efforts in the line of reorienting of its export flows to the EU on the product direction: from raw materials to manufactured goods; and expanding them on the geographical direction; that will positively affect the domestic production’s development.

Trade potential for Armenia with the CIS countries:

Russia and Ukraine are the members of the CIS²⁹ countries, as well the main trade partners of Armenia. In 2007 they covered 21.5% of total Armenian export and 29.7% of total Armenian import flows (Table 1). Accounting that Armenian trade turnover with all the CIS countries amounts 32% of its total turnover - 31% of total export and 33% of total import flows (Appendices Figure 1) - we concentrate our study on these countries.

Armenian export potentials to Russia and Ukraine are extremely exceeded: by 80.57 US\$ millions to Russia and 10.54 US\$ million to Ukraine (Table 4). Moreover Armenian export potentials to these countries are exhausted on product groups “Food and beverages” and “Capital goods”.

²⁹ At the time of analysis – the years 2003-2007 - Georgia was a member of the CIS; however we analyze Armenian trade potential with Georgia as a neighboring country in the next section.

The product groups with potential to expand export seem to be “Consumer goods” to Ukraine by 0.63 US\$ million; and “Industrial supplies” to Russia by 1.54 US\$ million.

Studying Armenian export flows to these countries we see that they are relatively more diversified than the EU ones. More than half of Armenian export to Russia presents one product group “Beverages, spirits and vinegar”; and about 16% is “Pearls, precious stones, metals, coins”. To Ukraine Armenian export flows consist of two main groups: “Beverages, spirits and vinegar” on 19.0% and “Iron and steel” on 36.4%. One of the reasons that Armenian export flows to Russia and Ukraine (as well as to Iran and Georgia) are relatively more diversified than to other main trade partners (which are mainly the EU countries) is relatively weak competition, as well the presence of the cultural and historical similarities.

Analysis shows that “Beverages, spirits and vinegar” is the main product group supplied to these countries and the potential of its export is extremely exceeded. Armenia needs to diversify its export flows to Russia and Ukraine in order to improve its trade possibilities especially on such product groups as “Consumer goods” to Ukraine and “Industrial supplies” to Russia.

Looking at the Table 4 we observe that one more CIS country presents possibility to expand Armenian export: it’s Azerbaijan. As this country is Armenian neighbor we consider it in a detail in the next section.

Totally the CIS countries (those having the export potential for Armenia) present the possibilities to increase Armenian export by 9.15 US\$ million (noting that export potential to Azerbaijan is about 6.84 US\$ millions).

Concluding we have to point out that the markets of the CIS countries can’t be considered as perspective ones for Armenia.

Trade potential for Armenia with neighboring countries:

Armenian neighboring countries are Georgia, Iran, Turkey, and Azerbaijan. Armenia has not official political and economic relations with Turkey and Azerbaijan. At nonofficial level there are trade relations between Armenia and Turkey.

Armenian export to Turkey in absolute value is rather small, it's about 790 US\$ thousand, that amounts about 0.07% of total Armenian export flows. However according to our results Turkey presents the possibilities to increase Armenian export by 40.72 US\$ million. Product group with maximum potential is "Industrial supplies" - 50.36 US million. Accounting the current political problems between Armenia and Turkey, closed border and etc. our results allows to suggest that re-opening of Armenian-Turkish border would positively impact Armenian export positions, that stimulates domestic production development.

Armenian export potential for Azerbaijan is about 6.84 US\$ million. However taking into account the current situation in the South Caucasian region we assume that without political solution of the problems there is no sense to discuss any economic possibilities.

Georgia and Iran are the main trade partners of Armenia. 10.9% of total Armenian export goes to these countries. Armenia directs about 7.6% of its export to Georgia. And the product composition of the export is relatively diversified: product group "Salt, sulphur, earth, stone, plaster, lime and cement" covers about 44.2% of export flows, "Coffee, tea, mate and spices" is about 18.4%, "Glass and glassware" is about 8%, and "Plastics and articles thereof" is about 7.5%. But looking at the Table 4 we observe that Armenia has exceeded its export potential with Georgia by 29.51 US\$ million. Moreover there is no product group with potential to expand Armenian export flows to Georgia.

Iran presents more pleasant picture. To Iranian market Armenia supplies "Aluminium and articles thereof" (30.2% of total export), "Mineral fuels, oils, distillation products, etc" (26.2%), "Iron and steel" (9%). Though Armenian export potential to Iran has been exceeded by 5.83 US\$ million, Armenia has possibility to expand its export to Iran on product groups "Food and beverages" by 3.76 US\$ million, "Industrial supplies" by 6.63 US\$ million, "Consumer goods" by 0.68 US\$ million.

Resuming we have to note that in the regional aspect Armenian producers have possibilities to expand their positions only to Iran's market on the several product groups.

Trade potential for Armenia with other countries:

Looking through the list of the countries with maximal potential to expand Armenian export we observe that two groups of countries are not considered, there are North American countries and Asian countries.

North American countries:

In the North America there are two countries having export potentials for Armenia: the USA and Mexico. Besides the USA is a main trade partner of Armenia. 4.5% of total Armenian export goes to the USA; it mainly consists of one product group “Pearls, precious stones, metals, coins”. Based on our results we can state that the USA is on the first place on export potential for Armenia and present the possibility to increase the volumes of Armenian export by 54.8 US\$ million, especially on product groups “Industrial supplies”, “Capital goods”, and “Food and beverages”. Export potential on “Consumer goods” is exceeded. Total Armenian export potential to the Mexican markets is about 8.8 US\$ million, mainly on product group “Industrial supplies”.

Asian countries:

Asian countries present a wide group of countries from different parts of Asian region. Among them there are Japan, China, Hong Kong, India, Korea, Singapore, Saudi Arabia and UAE. Totally these Asian countries present the possibilities to increase Armenian export by 134.56 US\$ million, especially on the product groups “Industrial supplies” (115.31 US\$ million) and “Food and beverages” (18.89 US\$ million). As well we have to note that for all mentioned countries there are no product groups where Armenian export potentials would be exceeded.

CONCLUSIONS

In general analyzing Armenian export potentials on total and on product groups we can point out a few moments. The main evidence is that the present geographical and product compositions of Armenian export are insufficient: trade relations with most of the leading trade partners, including two neighboring countries – Georgia and Iran, have no potential for developing.

Among positive results we should note that the most perspective directions of Armenia's exports expansion are "Industrial supplies", "Food and beverages" and "Consumer goods" product groups.

Another interesting finding is the fact that Turkey is on the second place on potential to expand Armenia's export and thus presents the possibility to increase total Armenian export by 40.72 US\$ millions. Taking into account the political and geopolitical aspects of process of Armenian-Turkish border's re-opening this fact can be interpreted as evidence in favor of stimulating this process.

In a general our main findings and policy recommendations are the following:

(i) Armenia has no potential to expand its export to the CIS countries, mainly it's exceeded.

(ii) Armenia has to reorient its export flows to the EU countries on product direction: to enhance export of product groups "Food and beverages", "Consumer goods" and "Industrial supplies"; and on geographical direction: markets of France, the UK, Spain, Italy, Sweden, Poland, and Greece present possibility to increase Armenian export totally by 105.18 US\$ million.

(iii) In regional aspect Armenian producers have possibilities to expand their positions only to Iran's market on the product groups "Food and beverages", "Industrial supplies" and "Consumer goods".

(iv) Asian countries seemed to be the most perspective directions of Armenian export expanding. Totally they present the possibilities to increase Armenian export by 134.56 US\$ million, especially on the product groups "Industrial supplies" and "Food and beverages".

Resuming we can assume that reorientation and diversification of product and geographical Armenian export compositions will stimulate the domestic production especially on "Industrial supplies", "Food and beverages", and "Consumer goods" product groups.

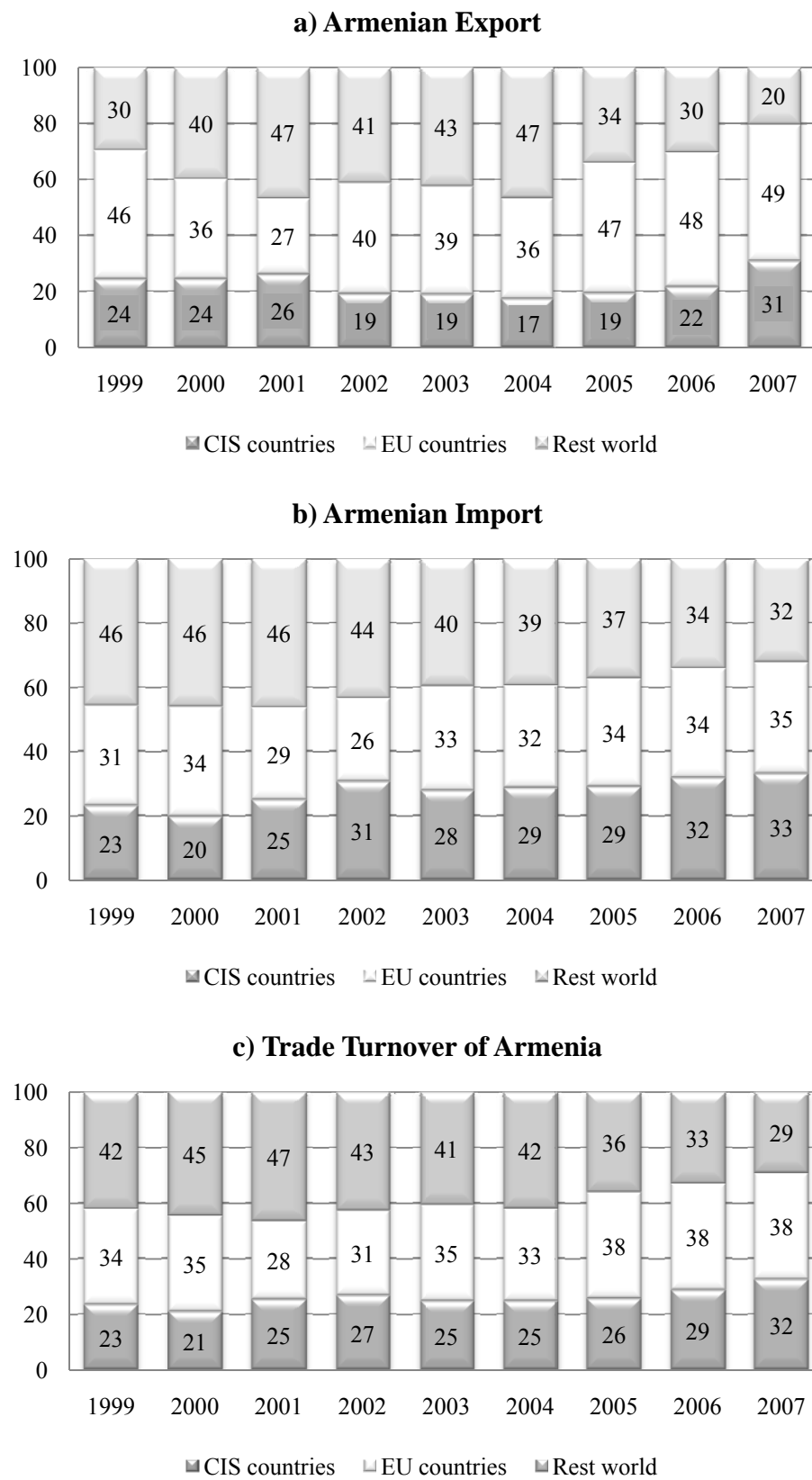
APPENDICES

Table 1: Agreements on Free Trade of the Republic of Armenia with Other Countries³⁰

Short Name	Signed Year	In Force Since
Armenia - Kazakhstan FTA	1999	2001
Armenia - Georgia FTA	1995	1998
Armenia - Turkmenistan FTA	1995	1996
Armenia - Ukraine FTA	1994	1996
Armenia - Kyrgyzstan FTA	1994	1995
Armenia - Moldova FTA	1993	1995
Armenia – Russian Federation FTA	1992	1993

³⁰ UNESCAP Database // www.unescap.org/tid/rta.asp //17.10.2010

Figure 1: Main Trade Partners of Armenia (as a share to total trade flow, %)³¹



³¹ Statistical Yearbook of the Republic of Armenia, 2008, 2004 // www.armstat.am

Table2: List of Countries

1	Albania	36	Cyprus	71	Kuwait	106	San Marino
2	Algeria	37	Czech Rep.	72	Kyrgyzstan	107	Saudi Arabia
3	Andorra	38	Benin	73	Lebanon	108	Senegal
4	Angola	39	Denmark	74	Latvia	109	India
5	Azerbaijan	40	Dominica	75	Liberia	110	Singapore
6	Argentina	41	Dominican Rep.	76	Libya	111	Slovakia
7	Australia	42	Ecuador	77	Lithuania	112	Viet Nam
8	Austria	43	El Salvador	78	Luxembourg	113	Slovenia
9	Bahrain	44	Ethiopia	79	Malaysia	114	South Africa
10	Bangladesh	45	Estonia	80	Mali	115	Zimbabwe
11	Armenia	46	Finland	81	Malta	116	Spain
12	Barbados	47	France	82	Mexico	117	Sudan
13	Belgium	48	Gabon	83	Mongolia	118	Suriname
14	Bhutan	49	Georgia	84	Moldova	119	Swaziland
15	Bolivia	50	Germany	85	Morocco	120	Sweden
16	Bosnia&Herzegovina	51	Ghana	86	Mozambique	121	Switzerland
17	Botswana	52	Greece	87	Oman	122	Syria
18	Brazil	53	Guatemala	88	Nepal	123	Tajikistan
19	Belize	54	Guinea	89	Netherlands	124	Thailand
20	Bulgaria	55	Haiti	90	New Zealand	125	UAE
21	Belarus	56	Honduras	91	Nicaragua	126	Tunisia
22	Cambodia	57	Hong Kong	92	Niger	127	Turkey
23	Cameroon	58	Hungary	93	Nigeria	128	Turkmenistan
24	Canada	59	Iceland	94	Norway	129	Uganda
25	Cape Verde	60	Indonesia	95	Pakistan	130	Ukraine
26	Central African Rep.	61	Iran	96	Panama	131	TFYR of Macedonia
27	Sri Lanka	62	Iraq	97	Paraguay	132	Egypt
28	Chad	63	Ireland	98	Peru	133	UK
29	Chile	64	Israel	99	Philippines	134	USA
30	China	65	Italy	100	Poland	135	Uruguay
31	Colombia	66	Japan	101	Portugal	136	Uzbekistan
32	Comoros	67	Kazakhstan	102	Qatar	137	Venezuela
33	Congo	68	Jordan	103	Romania	138	Yemen
34	Costa Rica	69	Kenya	104	Russia	139	Zambia
35	Croatia	70	Rep. of Korea	105	Rwanda		

Table 3: List of Variables

Variable	Description
<i>Dependent variable</i>	
Export	Export flows from country i to country j
<i>Gravity variables</i>	
Importer GDP	GDP per capita in importing country (in constant prices 2000)
Exporter GDP	GDP per capita in exporting country (in constant prices 2000)
Distance	Distance between exporting country and importing country
Common Language	Common language in exporting country and importing country
Common Border	Common Border between exporting country and importing country
Colony	Colonial ties between exporting country and importing country (in the past)
Landlocked	Exporting country and/or importing country is/are landlocked
FTA	Free trade agreement between exporting country and importing country
WTOboth	Both exporting and importing countries are the members of WTO
WTONone	None of the exporting and importing countries is a member of WTO

Table 4: Descriptive Statistics of the Variables

Variables	Obs.	Mean	Std. dev.	Min	Max
<i>Dependant variables</i>					
Export total	82750	5.80e+08	5.20e+09	0	3.32e+11
Export of Food & Beverages	82750	3.44e+07	2.97e+08	0	1.66e+10
Export of Industrial Supplies	82750	1.55e+08	1.33e+09	0	8.79e+10
Export of Fuels & Lubricants	82750	5.83e+07	8.63e+08	0	8.29e+10
Export of Capital Goods	82750	1.48e+08	1.61e+09	0	1.11e+11
Export of Transport Equipment	82750	8.35e+07	1.16e+09	0	7.74e+10
Export of Consumer Goods	82750	7.82e+07	8.44e+08	0	8.48e+10
Export of Goods (not classified)	82750	2.20e+07	3.02e+08	0	2.08e+10
<i>Independent variables</i>					
GDPexp	95910	8163.19	11205.93	123.18	54482.12
GDPimp	95910	8163.19	11205.93	123.18	54482.12
Distance	95910	7105.54	4268.42	59.62	19812.04
Common Language	95910	0.11	0.31	0	1
Common Border	95910	0.02	0.15	0	1
Colony	95910	0.01	0.12	0	1
Landlocked	95910	0.48	0.60	0	2
WTOboth	95910	0.67	0.47	0	1
WTONone	95910	0.03	0.17	0	1
FTA	95910	0.08	0.27	0	1

Table 5: Results of the Gravity Model Estimation by Helpman-Melitz-Rubinstein Model

	Total		Food & Beverages		Industrial Supplies		Fuels & Lubricants		Capital Goods		Transport Equipment		Consumer Goods		Goods (not classified)	
	NLS	OLS	NLS	OLS	NLS	OLS	NLS	OLS	NLS	OLS	NLS	OLS	NLS	OLS	NLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
LnGDPexp	1.37*** (0.11)	0.89*** (0.18)	1.14*** (0.14)	0.64*** (0.21)	1.11*** (0.14)	0.32 (0.21)	0.94*** (0.26)	0.60* (0.36)	0.79*** (0.14)	0.66*** (0.21)	1.17*** (0.16)	0.93*** (0.27)	0.98*** (0.13)	0.67*** (0.20)	1.30*** (0.28)	1.06** (0.47)
LnGDPimp	-0.13 (0.14)	0.69*** (0.12)	0.69*** (0.17)	0.58*** (0.16)	0.45*** (0.15)	0.52*** (0.15)	0.82*** (0.32)	1.27*** (0.33)	0.47*** (0.14)	0.71*** (0.16)	0.17 (0.17)	0.99*** (0.19)	0.33** (0.14)	0.95*** (0.15)	0.32 (0.26)	0.27 (0.30)
LnDistance	-0.10 (0.10)	-1.27*** (0.03)	-0.68*** (0.19)	-1.26*** (0.04)	-0.48*** (0.09)	-1.38*** (0.04)	-0.44 (0.37)	-2.39*** (0.08)	-0.34*** (0.08)	-1.32*** (0.04)	-0.38*** (0.08)	-1.57*** (0.04)	-0.23*** (0.09)	-1.36*** (0.04)	-1.2*** (0.09)	-1.40*** (0.05)
Common Language	-0.33*** (0.11)	0.73*** (0.06)	0.29* (0.15)	0.69*** (0.07)	-0.10 (0.09)	0.62*** (0.06)	-0.93*** (0.21)	0.08 (0.12)	0.20** (0.09)	1.06*** (0.06)	-0.04 (0.09)	1.07*** (0.07)	-0.17 (0.10)	0.95*** (0.07)	0.58*** (0.11)	0.78*** (0.08)
Common Border	1.85*** (0.14)	1.14*** (0.12)	1.11*** (0.12)	1.25*** (0.12)	1.42*** (0.13)	1.05*** (0.13)	-0.05 (0.25)	1.12*** (0.18)	1.20*** (0.13)	1.01*** (0.13)	0.73*** (0.12)	0.93*** (0.12)	1.35*** (0.13)	1.18*** (0.13)	0.55*** (0.16)	0.68*** (0.16)
Colony	1.02*** (0.10)	0.71*** (0.10)	1.00*** (0.11)	1.00*** (0.11)	1.00*** (0.11)	0.84*** (0.11)	0.55** (0.23)	1.30*** (0.16)	0.76*** (0.11)	0.72*** (0.11)	0.23* (0.12)	0.65*** (0.11)	0.75*** (0.12)	0.75*** (0.12)	0.58*** (0.15)	0.74*** (0.14)
Landlocked	8.27*** (0.54)	-2.97*** (0.57)	-2.46 (1.56)	-2.55*** (1.44)	-0.72 (0.61)	0.99 (0.79)	2.56*** (0.98)	-0.52 (1.08)	2.65*** (0.78)	-2.42*** (0.95)	1.52 (2.01)	-1.14* (0.61)	4.11*** (0.78)	1.03 (1.72)	5.12*** (2.01)	-1.35
FTA	0.04 (0.08)	0.58*** (0.06)	0.31** (0.13)	0.64*** (0.08)	0.28*** (0.07)	0.67*** (0.07)	-0.06 (0.19)	0.61*** (0.14)	0.41*** (0.07)	0.73*** (0.07)	0.35*** (0.09)	0.88*** (0.08)	0.02 (0.08)	0.50*** (0.08)	0.05 (0.10)	0.11 (0.10)
eta_hat	-1.97*** (0.18)	6.45*** (0.68)	-0.04 (0.30)	5.22*** (0.72)	-0.79*** (0.13)	6.99*** (0.69)	-0.74* (0.40)	0.01 (0.93)	-0.05 (0.11)	7.14*** (0.74)	0.15 (0.11)	4.11*** (0.81)	-0.71*** (0.13)	11.3*** (0.67)	1.07*** (0.18)	2.95*** (0.86)
delta (from w hat)	2.30*** (0.16)		1.17*** (0.31)		1.72*** (0.12)		2.57*** (0.44)		1.69*** (0.10)		1.95*** (0.11)		2.23*** (0.12)		0.52*** (0.17)	
z		-78.3*** (5.25)		-57.2*** (6.32)		-77.4*** (7.02)		-10.5 (6.53)		-61.2*** (6.67)		-33.4*** (6.70)		-118*** (6.78)		-36.7*** (6.68)
z2		31.7*** (2.16)		22.5*** (2.53)		30.6*** (3.39)		5.7*** (2.14)		22.1*** (2.68)		12.4*** (2.46)		48.1*** (3.21)		15.4*** (2.38)
z3		-4.4*** (0.35)		-2.9*** (0.38)		-4.1*** (0.61)		-0.7*** (0.26)		-2.7*** (0.40)		-1.5*** (0.33)		-6.9*** (0.57)		-2.1*** (0.32)
Log pseudo-likelihood	-72307.1		-58925.6		-69064.6		-42094.3		-55216.8		-50793.9		-62084.8		-47509.0	
Number of observations	63337	63337	48117	48117	57270	57270	26846	26846	49085	49085	41752	41752	52802	52802	32427	32427

Constant term, exporter country, importer country, and time fixed effects are included but not reported. Standard errors, clustered by country pair, are presented in parentheses, ***, **, and * denote 1%, 5%, and 10% significance levels, respectively.

Table 6: Countries where Armenia Has Maximally Exceeded its Export Potential, US\$ millions

Country	Year	Total	Food & Beverages	Industrial Supplies	Fuels & Lubricants	Capital Goods	Transport Equipment	Consumer Goods	Goods(not classified)
Belgium	2007	-83.60	1.51	-83.39	0.21	0.27	0.00	1.48	0.00
	2006	-95.69	1.08	-95.60	0.18	0.22	-0.15	1.15	0.00
	2005	-114.23	0.97	-113.31	0.13	0.16	-0.08	-0.09	0.00
	2004	-99.64	0.82	-98.90	0.08	0.11	-0.01	0.09	0.00
	2003	-117.46	0.56	-117.20	0.06	0.07	-0.02	0.49	0.00
Israel	2007	-10.45	1.47	-4.18	0.15	0.38	0.05	-0.47	0.00
	2006	-94.04	1.11	-90.52	0.13	0.30	0.04	0.65	0.00
	2005	-102.46	0.90	-99.82	0.10	0.23	0.03	0.55	0.00
	2004	-90.77	0.69	-88.31	0.06	0.17	0.02	0.39	0.00
	2003	-136.53	0.60	-134.82	0.04	0.13	0.01	0.35	0.00
Russia	2007	-135.32	-100.73	-11.67	0.15	-11.55	-1.43	-4.48	0.01
	2006	-68.83	-59.19	7.78	0.12	-9.54	-0.17	-4.11	-0.07
	2005	-79.94	-69.57	5.08	0.09	-7.67	-0.55	-3.73	-0.01
	2004	-47.92	-47.15	11.43	0.06	-8.64	-0.56	0.87	0.01
	2003	-70.84	-52.82	-4.89	0.04	-8.39	-0.49	-0.75	-0.08
Netherlands	2007	-128.53	3.77	-138.47	1.05	0.96	0.06	2.24	0.00
	2006	-105.34	2.87	-113.54	0.90	0.74	0.04	1.87	0.00
	2005	-113.15	2.37	-119.42	0.68	0.56	-0.24	1.57	0.00
	2004	-12.76	1.97	-17.71	0.42	0.44	0.01	1.26	0.00
	2003	-11.34	1.64	-15.24	0.30	0.32	0.02	0.99	0.00
Germany	2007	-97.30	5.17	-120.25	0.71	2.35	0.40	5.30	0.01
	2006	-90.85	3.64	-109.26	0.61	1.78	-0.19	4.46	0.00
	2005	-102.69	3.25	-115.91	0.46	0.44	-0.36	3.18	0.01
	2004	-47.19	2.41	-57.87	0.29	1.06	-0.40	2.99	0.01
	2003	-16.28	2.31	-24.87	0.20	0.64	-0.41	2.70	-0.27
Switzerland	2007	-35.81	0.77	-32.55	0.33	0.29	0.02	-2.23	0.00
	2006	-61.47	0.59	-61.04	0.28	0.23	0.02	0.14	0.00
	2005	-26.30	0.47	-25.23	0.22	0.13	0.01	-0.56	0.00
	2004	-38.70	0.38	-37.78	0.13	0.05	0.01	-0.27	0.00
	2003	-27.53	0.34	-27.13	0.09	0.11	0.01	-0.04	0.00
Georgia	2007	-55.37	-11.63	-35.64	0.45	-3.20	-0.35	-1.11	0.00
	2006	-37.54	-7.66	-16.78	-6.85	-2.40	-0.27	-0.82	0.00
	2005	-26.70	-3.41	-9.61	-10.33	-0.32	-0.37	-0.31	0.00
	2004	-19.75	-3.39	-3.81	-8.85	-0.72	-0.44	-0.52	0.00
	2003	-8.21	-0.12	0.31	-5.25	-0.17	-1.13	-0.18	0.00
Ukraine	2007	-31.39	-10.72	-15.64	0.17	-7.32	-0.55	1.23	0.00
	2006	-11.21	-9.29	-3.48	0.15	-0.32	-0.21	0.77	0.00
	2005	-5.24	-9.25	3.23	0.11	-0.15	-0.31	0.36	0.00
	2004	-3.83	-3.07	1.64	0.07	-3.05	-0.40	0.54	0.00
	2003	-2.05	-4.46	2.73	0.05	-0.64	-0.18	0.25	0.00

**Table 6: Countries where Armenia Has Maximally Exceeded its Export Potential, US\$ millions
(continued)**

Country	Year	Total	Food & Beverages	Industrial Supplies	Fuels & Lubricants	Capital Goods	Transport Equipment	Consumer Goods	Goods (not classified)
Bulgaria	2007	-42.74	0.33	-42.93	0.11	0.10	0.01	0.11	0.00
	2006	1.89	0.21	1.72	0.09	0.05	0.01	0.14	0.00
	2005	1.58	-0.30	1.90	0.07	0.00	0.01	0.19	0.00
	2004	-2.77	-0.70	-1.92	0.04	-0.02	0.00	0.09	0.00
	2003	-0.10	0.14	-0.12	0.03	-0.03	0.00	0.10	0.00
Iran	2007	-1.55	6.25	12.80	-9.30	-0.20	-0.06	0.88	0.00
	2006	-1.59	2.95	13.19	-9.76	-0.20	-0.21	0.99	0.00
	2005	-3.62	3.97	7.10	-6.95	-1.41	0.01	0.41	0.00
	2004	-13.49	2.94	-0.48	-8.22	-2.42	-0.02	0.59	0.00
	2003	-8.87	2.67	0.55	-4.14	-3.25	-0.73	0.51	0.00

Table 7: Countries where Armenia has the Maximal Potential for its Export Expansion, US\$ millions

Country	Year	Total	Food & Beverages	Industrial Supplies	Fuels & Lubricants	Capital Goods	Transport Equipment	Consumer Goods	Goods (not classified)
USA	2007	124.64	5.75	61.98	2.99	5.28	0.90	-1.43	0.00
	2006	74.11	2.51	37.27	2.57	4.20	0.60	-13.98	0.00
	2005	47.73	3.10	23.90	1.95	2.49	0.41	-16.15	0.01
	2004	16.26	1.87	9.33	1.21	2.03	0.24	-22.32	0.01
	2003	11.45	0.71	8.48	0.85	1.14	0.16	-18.01	0.00
Turkey	2007	64.13	4.73	80.05	1.69	1.37	0.22	2.94	0.01
	2006	50.76	3.61	61.54	1.45	1.27	0.15	2.28	0.01
	2005	38.42	2.92	46.62	1.10	0.85	0.10	1.95	0.01
	2004	28.57	2.34	36.35	0.68	0.55	0.07	1.45	0.01
	2003	21.72	1.85	27.22	0.47	0.51	0.04	1.23	0.01
Japan	2007	52.14	9.08	31.31	2.84	1.54	0.15	3.30	0.00
	2006	44.80	6.96	27.48	2.45	1.19	0.11	2.73	0.00
	2005	34.39	5.74	20.46	1.86	0.93	0.08	2.37	0.00
	2004	27.94	4.70	17.36	1.15	0.72	0.06	1.98	0.00
	2003	21.59	3.95	13.14	0.81	0.54	0.04	1.66	0.00
China	2007	60.76	5.90	62.32	0.84	3.57	0.10	1.08	0.01
	2006	50.13	4.23	51.24	0.71	2.56	-0.07	0.88	0.00
	2005	27.97	3.29	38.29	0.53	-6.90	0.05	0.35	0.00
	2004	5.99	2.58	9.45	0.33	0.35	0.03	0.29	0.00
	2003	15.64	2.03	17.43	0.23	0.95	0.02	0.30	0.00
France	2007	32.70	3.10	24.35	0.73	-4.66	0.21	3.52	0.00
	2006	29.34	2.36	19.23	0.63	-0.41	0.15	2.44	0.00
	2005	24.68	1.98	15.22	0.48	0.73	0.11	2.30	0.00
	2004	19.42	1.35	12.34	0.29	0.56	0.09	2.10	0.00
	2003	14.51	1.09	9.05	0.21	0.26	0.06	1.80	0.00
UK	2007	47.91	5.47	27.59	0.89	1.29	0.27	4.50	0.00
	2006	32.70	4.38	15.77	0.77	0.84	0.20	3.85	0.00
	2005	31.24	3.66	17.38	0.58	0.73	0.15	3.45	0.00
	2004	24.02	3.06	13.71	0.33	0.52	-0.19	2.86	0.00
	2003	-23.46	2.53	-30.22	0.25	0.47	0.07	0.73	-0.05
Spain	2007	22.45	3.83	9.81	0.55	1.05	0.22	3.27	0.00
	2006	3.27	2.84	-7.24	0.47	0.82	0.16	2.70	0.00
	2005	23.33	2.46	14.76	0.36	0.64	0.12	2.29	0.00
	2004	18.06	1.94	11.63	0.22	0.49	0.09	1.94	0.00
	2003	13.40	1.04	8.84	0.16	0.38	0.06	1.57	0.00
Italy	2007	32.98	8.67	46.41	1.54	0.73	0.24	-19.40	0.01
	2006	21.75	6.73	34.88	1.33	0.87	0.18	-19.44	0.01
	2005	14.56	5.74	30.68	1.01	0.43	0.13	-21.21	0.01
	2004	4.08	4.83	25.15	0.63	0.63	0.10	-24.91	0.01
	2003	6.32	4.11	18.07	0.44	0.45	0.08	-15.09	0.01

**Table 7: Countries where Armenia has the Maximal Potential for its Export Expansion, US\$ millions
(continued)**

Country	Year	Total	Food & Beverages	Industrial Supplies	Fuels & Lubricants	Capital Goods	Transport Equipment	Consumer Goods	Goods (not classified)
Hong Kong	2007	24.62	1.46	19.25	0.18	1.50	0.04	0.41	0.00
	2006	17.86	1.09	13.23	0.15	1.15	0.03	0.53	0.00
	2005	15.02	0.88	11.26	0.12	0.83	0.02	0.73	0.00
	2004	7.21	0.70	5.43	0.07	0.65	0.01	-0.22	0.00
	2003	6.52	0.56	4.97	0.05	0.47	0.01	0.10	0.00
Saudi Arabia	2007	18.46	4.87	13.85	0.01	0.59	0.12	1.50	0.00
	2006	14.74	3.77	10.71	0.01	0.46	0.08	1.23	0.00
	2005	11.67	3.07	8.41	0.01	0.36	0.06	1.06	0.00
	2004	8.86	2.61	6.78	0.00	-0.11	0.05	0.89	0.00
	2003	7.10	2.16	5.11	0.00	0.21	0.03	0.73	0.00
India	2007	17.19	1.65	24.07	0.63	0.58	0.05	0.29	0.00
	2006	14.89	1.21	19.85	0.54	0.43	0.03	0.22	0.00
	2005	11.25	0.96	15.06	0.41	0.32	0.02	0.18	0.00
	2004	8.50	0.77	11.85	0.25	0.24	0.01	0.14	0.00
	2003	6.51	0.62	8.95	0.18	0.17	0.01	0.11	0.00
Sweden	2007	17.13	2.00	11.64	0.15	0.58	0.08	1.42	0.00
	2006	13.60	1.49	8.98	0.13	0.41	0.06	1.25	0.00
	2005	10.62	1.19	6.94	0.10	0.33	0.04	1.09	0.00
	2004	8.46	1.05	5.61	0.06	0.25	0.03	0.94	0.00
	2003	6.42	0.85	4.22	0.04	0.20	0.02	0.73	0.00
Korea	2007	16.85	1.87	16.10	0.78	0.71	0.04	0.47	0.00
	2006	12.68	1.18	12.06	0.67	0.54	0.02	0.38	0.00
	2005	10.13	1.04	9.60	0.50	0.41	0.02	0.26	0.00
	2004	7.53	0.95	7.51	0.31	0.31	0.01	-0.08	0.00
	2003	6.04	0.78	5.70	0.22	0.23	0.01	0.21	0.00
Singapore	2007	14.42	0.69	7.24	0.28	0.81	0.04	0.51	0.00
	2006	11.32	0.53	5.54	0.24	0.62	0.03	0.41	0.00
	2005	8.57	0.42	4.21	0.18	0.47	0.02	0.28	0.00
	2004	6.73	0.35	3.38	0.11	0.36	0.01	0.28	0.00
	2003	4.99	0.28	2.50	0.08	0.26	0.01	0.22	0.00
Mexico	2007	13.45	1.13	10.17	0.12	0.59	0.05	0.82	0.00
	2006	10.64	0.88	7.82	0.10	0.45	0.03	0.67	0.00
	2005	8.29	0.72	6.05	0.08	0.35	0.02	0.56	0.00
	2004	6.57	0.60	4.88	0.05	0.27	0.02	0.47	0.00
	2003	5.05	0.50	3.70	0.03	0.21	0.01	0.39	0.00
UAE	2007	20.61	3.38	17.28	0.07	0.40	-0.49	2.44	0.00
	2006	16.00	2.62	12.83	0.06	-0.19	0.11	2.04	0.00
	2005	7.05	2.25	5.51	0.04	-1.33	0.08	1.66	0.00
	2004	4.55	1.84	5.69	0.03	-0.58	-0.07	-0.99	0.00
	2003	-6.48	1.40	-5.84	0.02	-0.42	-0.39	-0.10	0.00

**Table 7: Countries where Armenia has the Maximal Potential for its Export Expansion, US\$ millions
(continued)**

Country	Year	Total	Food & Beverages	Industrial Supplies	Fuels & Lubricants	Capital Goods	Transport Equipment	Consumer Goods	Goods(not classified)
Poland	2007	10.45	1.48	7.70	0.22	0.25	0.08	1.35	0.00
	2006	5.52	1.04	3.07	0.19	0.42	0.05	1.06	0.00
	2005	10.13	0.93	8.18	0.14	0.31	0.03	0.86	0.00
	2004	7.89	0.76	6.56	0.09	0.24	0.02	0.70	0.00
	2003	5.83	0.62	4.76	0.06	0.18	0.02	0.58	0.00
Australia	2007	11.31	0.73	6.37	0.22	0.39	0.08	1.04	0.00
	2006	9.63	0.55	5.55	0.19	0.30	0.05	0.89	0.00
	2005	7.78	0.54	4.41	0.14	0.24	0.04	0.76	0.00
	2004	6.01	0.44	3.38	0.09	0.18	0.03	0.68	0.00
	2003	4.71	0.38	2.63	0.06	0.14	0.02	0.56	0.00
Greece	2007	11.74	2.57	8.57	0.21	-1.72	0.06	1.63	0.00
	2006	10.69	1.97	6.87	0.18	-0.17	0.05	1.26	0.00
	2005	8.13	1.58	5.23	0.14	-0.21	0.01	1.09	0.00
	2004	6.07	1.35	4.25	0.09	-0.57	0.02	0.90	0.00
	2003	0.03	1.09	-0.72	0.06	-1.05	0.02	0.68	0.00
Azerbaijan	2007	12.87	3.44	9.74	0.05	0.40	0.10	1.22	0.00
	2006	9.03	2.35	6.94	0.04	0.28	0.05	0.86	0.00
	2005	5.70	1.58	4.70	0.03	0.17	0.02	0.57	0.00
	2004	3.80	1.12	3.42	0.02	0.11	0.01	0.39	0.00
	2003	2.78	0.88	2.50	0.01	0.08	0.01	0.31	0.00

Figure 2: Countries with Maximal Potential to Expand Armenian Export, US\$ millions (averages for the years 2003-2007)

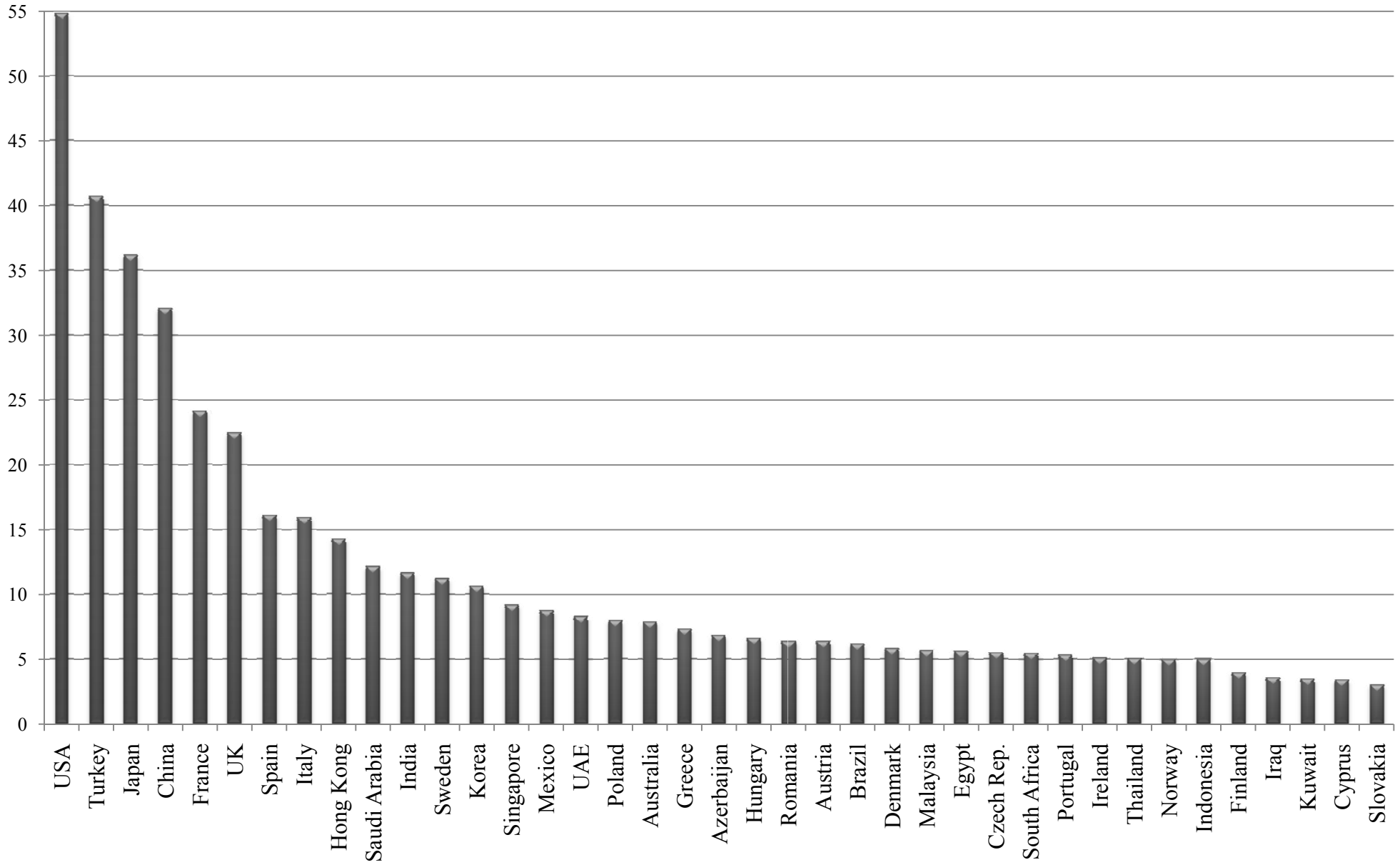


Figure 3: Countries with Potential to Expand Armenian Export less than 3 US\$ million, US\$ million (averages for the years 2003-2007)

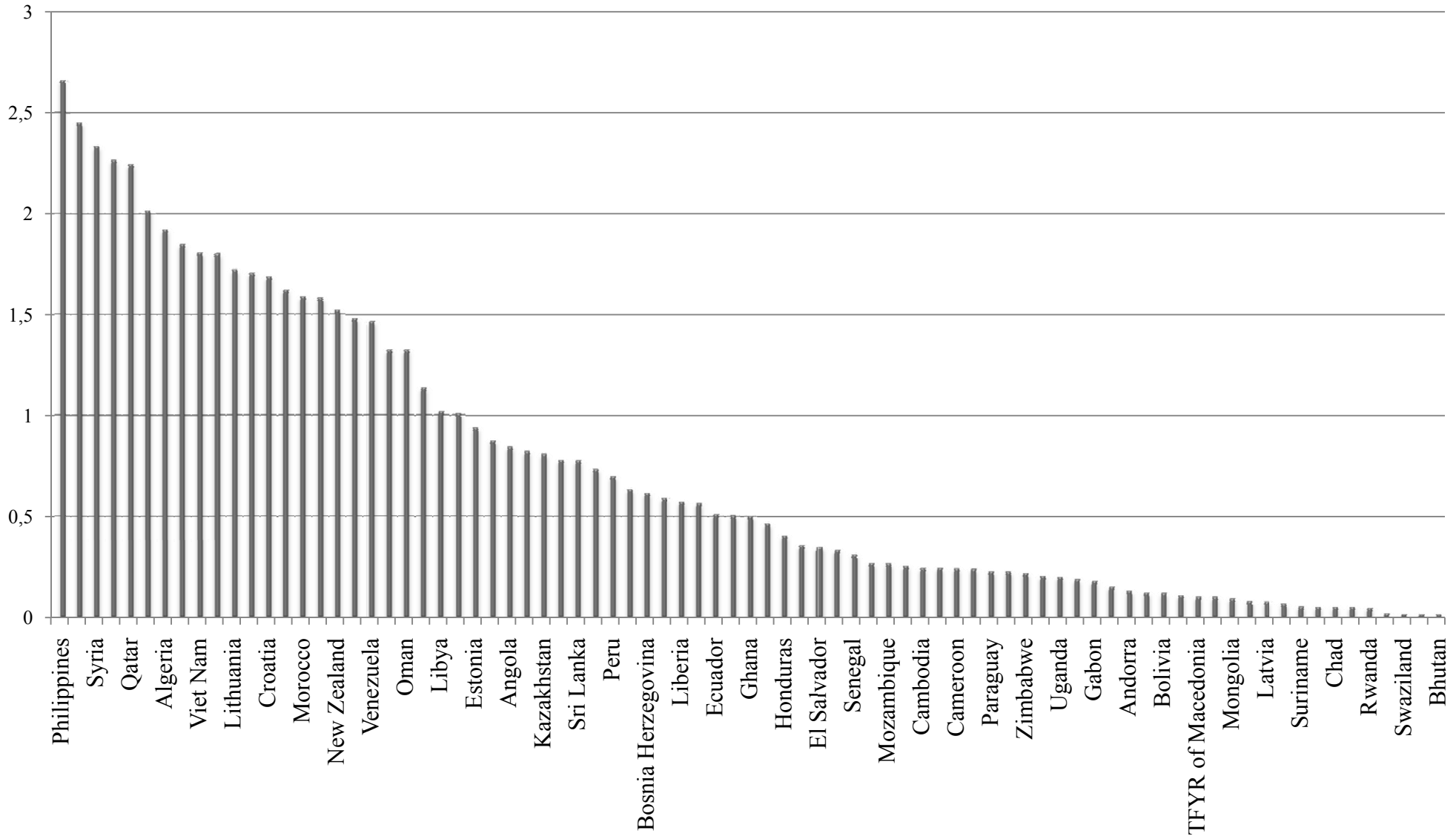
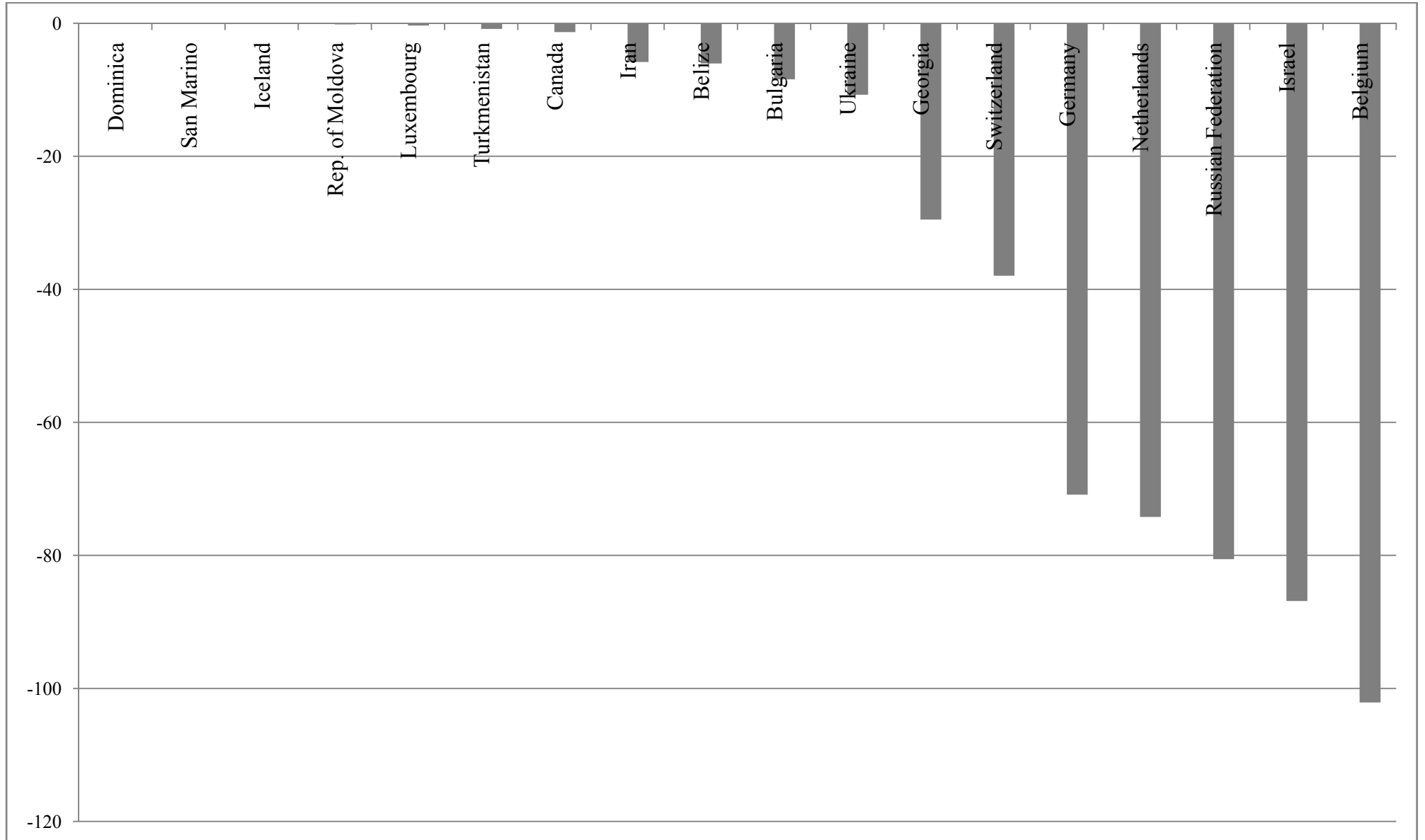


Figure 4: Countries where Armenia has Exceeded its Export Potential, US\$ million (averages for the years 2003-2007)



REFERENCES

- Afonso, O. (2001) "The Impact of International Trade on Economic Growth", *CEMPRE*.
- Anderson, J.E. and E. van Wincoop (2004) "Trade Costs", *NBER Working Paper Series*, No. 10480.
- Armstrong, Sh. (2007) "Measuring Trade and Trade Potential: a Survey", *Asia Pacific Economic Paper Series*, No. 368.
- Baldwin, R.E. (1993) "The Potential for Trade between Countries of EFTA and Central and Eastern Europe", *Occasional Papers* No 44, European Free Trade Association, Geneva.
- Baldwin, R.E. (1994) "Towards an Integrated Europe", *Centre for Economic Policy Research*.
- Batra, A. (2004) "India's Global Trade Potential: The Gravity Model Approach", *Indian Council for Research on International Economic Relations*, Working Paper No.151.
- Baxter, M. and Kouparitsas, M.A. (2005) "What Determines Bilateral Trade Flows?" Federal Reserve Bank of Chicago, Working Paper 2005-11.
- Beilock, R. and Torosyan, K. (2007) "A Phased Strategy for Opening Armenia's Western Border", *AIPRG* and International School of Economics at Tbilisi State University.
- Bergstrand, J. H. (1985) "The Gravity Equation in International Trade - Some Microeconomic Foundations and Empirical Evidence", *Review of Economics and Statistics*, Vol.67, 1985, pp.474-481.
- Bhattacharyya, R. and Banerjee, T. (2006) "Does the Gravity Model Explain India's Direction of Trade? A Panel Data Approach", Working Paper No.2006-09-01, Indian Institute of Management.
- Buckley, P.J. and Casson, M. (1976) "*The Future of the Multinational Enterprise*", Holmes and Meier, New York. Cambridge Mass.: NBER, 1995.
- Deardorff A.V. (1998) "Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?", *NBER Working Paper* No 5377.
- De Benedictis, L. and Vicarelli, C. (2004) "Trade Potentials in Gravity Panel Data Models", *ISAE Working Papers* No.44
- DeRosa, A. et al. (2008) "*Prospects for Greater Global and Regional Integration in the Maghreb. Gravity Model Analysis*", Peterson Institute for International Economics, Washington, DC
- Doing Business in Armenia and Turkey, CSERA, June 2009.
- Egger, P. (2001) "An Econometric View on the Estimation of Gravity Models and the Calculation of Trade Potentials" *WIFO Working Papers* No.141.
- Eichengreen B. and Irwin D. (1997) "The role of history in bilateral trade flows", *NBER Working Paper* No.5565.
- Evenett, Simon. J. and Keller, Wolfgang (1998) "On Theories Explaining the Success of the Gravity Equation", Cambridge Mass.: *NBER Working Paper* No W6529
- Frankel, J. (1997) "Regional Trading Blocs", Institute for International Economics.
- Frankel, J. and Wei, S.J. (1993) "Trade Blocs and Currency Blocs", *NBER Working Paper* No. 4335, Cambridge, MA.
- Freinkman L., Polyakov E., Revenco C. (2004) "Armenia's Trade Performance in 1995-2002 and the Effect of Closed Borders: A Cross-Country Perspective", *The World Bank, Armenian International Research Policy Group*, Working Paper No. 04/04.
- Giragosian, R. Changing Armenia-Turkish Relations. *Friedrich-Ebert-Stiftung*. February 2009.
- Hausman, J.A., Taylor W.E. (1981) "Panel Data and Unobservable Individual Effect", *Econometrica* 49

- Helmets, Ch. and Pasteels, J.-M. (2005) "TradeSim (third version), a Gravity Model for the Calculation of Trade Potentials for Developing Countries and Economies in Transition", *ITC Working Paper*
- Helpman, E. and Krugman, P.R. (1985) "*Market Structure and Foreign Trade*", MIT Press
- Helpman, E., Melitz, M. and Rubinstein, Y. (2008) "Estimating Trade Flows: Trading Partners and Trading Volumes," *Quarterly Journal of Economics*, 123
- Iskandaryan, A., Minasyan, S. Pragmatic Policies vs. Historical Constraints: Analyzing Armenia-Turkey Relations. *Caucasus Institute Research Papers*, #1, January 2010. – Yerevan: Caucasus Institute, 2010. – 49 p.
- Jošić M. (2008) "Gravity Model and International Trade: the Case of OECD Countries". *Challenges of Economic Sciences in the 21st Century*, Model of Market Economy for Countries in Transition. P. 47-54.
- Julien, P.E., Joyal, A., Deshaies, L. and Ramanghalahy, C. (1997) "A typology of strategic behavior among small and medium-sized exporting businesses- a case study", *International Small Business Journal*, vol. 15, no.2, pp.33-49.
- Klein, M.W. and Shambaugh, J.C. (2004) "Fixed Exchange Rates and Trade", *NBER Working Paper* No. 10696.
- Kruger, A. (1997) "Trade Policy and Economic Development: How We Learn", *NBER Working Paper* No.5896.
- Krugman, P. (1998) "Space: The Final Frontier", *Journal of Economic Perspectives*, Vol.12, 1998, pp. 161-175
- Krugman, P. (1991) "*Geography and Trade*", Cambridge: MIT Press, 136 p.
- Krugman, P. (1991) "Increasing Returns and Economic Geography", *Journal of Political Economy*, Vol.3, , pp. 483-499
- Linnemann, H. (1966) "*An Econometric Study of International Trade Flows*", Amsterdam: North-Holland Publishing Company
- Martin, Will and Pham, Cong (2007) "Estimating the Gravity Model when Zero Trade Flows are Important", WB
- Martínez-Zarzoso, I. and Márquez-Ramos, L. (2005) "International Trade, Technological Innovation and Income: a Gravity Model Approach", *IVIE working papers*, WP-EC 2005-15
- Martínez-Zarzo, I. and Nowak-Lehmann, F. (2003) "Augmented Gravity Model: an Empirical Application to Mercosur-European Union Trade Flows", *Journal of Applied Economics*, Vol. VI, No. 2 (Nov 2003), 291-316
- Maryanchyk, I. (2005) "Ukrainian international trade. How far from the potential?", *EERC Working Paper Series*, WP No 05/14
- Mitra, S. et al. (2006) "Armenia. The Caucasian Tiger", Poverty Reduction and Economic Management Unit, Europe and Central Asia Region, The World Bank
- Paas, T. (2000) "Gravity Approach for Modeling Trade Flows between Estonia and the Main Trading Partners", Tartu University Press
- Paas, T. (2003) "Regional Integration and International Trade in the Context of EU Eastward Enlargement", *HWWA Discussion Paper* 218, <http://www.hwwa.de>
- Polyakov, E. (2002) "Armenia Trade Diagnostic Study", Poverty Reduction and Economic Management, Europe and Central Asia Region, The World Bank
- Poyhonen, P. (1963) "A Tentative Model for Volume in Trade Between Countries", *Weltwirtschaftliches Archiv*, Vol. 90, pp.91-113

- Rahman, M.M. (2003) "A Panel Data Analysis of Bangladesh's Trade: The Gravity Model Approach", University of Sydney
- Santos Silva, J. M. C. and Tenreyro, S. (2006) "The Log of Gravity", *The Review of Economics and Statistics*, November 2006, 88(4): 641–658
- Santos Silva, J. M. C. and Tenreyro, S. (2009a) "On the Existence of the Maximum Likelihood Estimates for Poisson Regression", *CEP Discussion Paper* No 932
- Santos Silva, J. M. C. and Tenreyro, S. (2009b) "Trading Partners and Trading Volumes: Implementing the Helpman-Melitz-Rubinstein Model Empirically"
- Shepotylo, O. (2009a) "Export Diversification across Industries and Space: Do CIS Countries Diversify Enough?" Discussion Papers 20, Kyiv School of Economics
- Shepotylo, O., (2009b) "Gravity with Zeros: Estimating Trade Potential of CIS Countries," Discussion Papers 16, Kyiv School of Economics
- Shepotylo, O. (2009c) "EU Integration and Trade: a Look from the Outside of the EU Eastern Border" KSE& KEI
- Sohn, C.-H. (2001) "A Gravity Model Analysis of Korea's Trade Patterns and the Effects of a Regional Trading Arrangement", *Korea Institute for International Economic Policy Working Paper Series* Vol. 2001-09,
- Sohn, C.-H. (2005) "Does the Gravity Model Fit Korea's Trade Patterns? Implications of Korea's FTA Policy and North Korean Trade", *Centre for International Trade Studies Working Paper* 2005-02, Study of Economic Relations between Georgia and Armenia: The Development of Regional Trade Related Growth in Samtskhe-Javakheti. CRRC-Georgia. August - September 2007.
- Spanu, V. (2003) "*Liberalization of the International Trade and Economic Growth: Implications for both Developed and Developing Countries*", Harvard University
- Tinbergen, J. (1962) "*Shaping the World Economy*", New York: Twentieth Century Fund
- Tobin, J. (1958) "Estimation of Relationships for Limited Dependent Variables", *Econometrica*, Vol. 26, No. 1.
- Vernon, R. (1966) "International Investment and International Trade in the Product Cycle", *Quarterly Journal of Economics*, vol. 80, pp.190-207.
- Wang, Z.K. and Winters, L.A. (1991) "The Trading Potential of Eastern Europe", *CEPR Discussion Paper* No 610, London
- Williamson, O.E. (1975) "*Markets and Hierarchies: Analysis and Antitrust Implications*", The Free Press, New York