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**Working Paper**

## Economic impact of a potential Free Trade Agreement (FTA) between the European Union and the Commonwealth of the Independent States

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# CASE Network Reports

## Economic Impact of a Potential Free Trade Agreement (FTA) Between the European Union and the Commonwealth of the Independent States

Joseph Francois  
Miriam Manchin

No. 84/2009



Warsaw Bishkek Kyiv Tbilisi Chisinau Minsk

The views and opinions expressed here reflect the authors' point of view and not necessarily those of CASE Network.

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## Contents

<b>1. Introduction .....</b>	<b>9</b>
<b>2. Trade and Production Structure of the EU and CIS .....</b>	<b>11</b>
2.1. Trade and Production structure of the CIS countries.....	11
2.2. Trade and Production structure of the EU .....	16
<b>3. The Model and the Data.....</b>	<b>20</b>
3.1. The CGE model .....	20
3.2. Model data .....	22
3.3. Setting up the analysis; baselines and trade liberalization scenarios .....	23
<b>4. Results.....</b>	<b>24</b>
4.1. Real Income Effects.....	24
4.2. Effects on Sectoral Outputs .....	24
4.2.1. Changes in sectoral output in the EU.....	25
4.2.2. Changes in sectoral output in the CIS .....	26
4.3. Effects on bilateral trade flows .....	27
4.4. Other Macroeconomic Results.....	30
4.5. Terms of Trade Effects .....	31
<b>5. Conclusions .....</b>	<b>33</b>
<b>6. Annex I Baseline scenario .....</b>	<b>35</b>
<b>7. Annex II Technical Annex: An Overview of the Computational Model ...</b>	<b>37</b>
7.1. Introduction.....	37
7.2. General structure.....	38
7.3. Taxes and policy variables.....	38
7.4. Trade and transportation costs and services barriers .....	39
7.5. The composite household and final demand structure.....	40
7.6. Market Structure .....	40
7.6.1. Demand for imports: Armington sectors.....	40
7.6.2. Imperfect competition .....	41
7.6.3. Markups .....	44
7.7. Investment.....	44
7.8. Aggregation scheme.....	44
<b>8. Country Study: Armenia .....</b>	<b>47</b>
8.1. Introduction.....	47
8.2. Trade and Production structure of Armenia.....	47
8.3. Results.....	50
8.3.1. Real Income Effects .....	50
8.3.2. Changes in sectoral output in Armenia .....	51
8.3.3. Effects on bilateral trade flows .....	52
8.3.4. Other Macroeconomic Results.....	55
8.3.5. Terms of Trade Effects .....	56

8.4. Conclusions .....	57
<b>9. Country Study: Azerbaijan .....</b>	<b>58</b>
9.1. Introduction .....	58
9.2. Trade and Production structure of Azerbaijan .....	58
9.3. Results .....	61
9.3.1. Real Income Effects .....	61
9.3.2. Changes in sectoral output in Azerbaijan .....	62
9.3.3. Effects on bilateral trade flows .....	63
9.3.4. Other Macroeconomic Results.....	66
9.3.5. Terms of Trade Effects .....	67
9.4. Conclusions .....	68
<b>10. Country Study: Georgia .....</b>	<b>69</b>
10.1. Introduction .....	69
10.2. Trade and Production structure of Georgia .....	69
10.3. Results .....	72
10.3.1. Real Income Effects .....	72
10.3.2. Changes in sectoral output in Georgia .....	73
10.3.3. Effects on bilateral trade flows .....	74
10.3.4. Other Macroeconomic Results.....	77
10.3.5. Terms of Trade Effects .....	78
10.4. Conclusions .....	79
<b>11. Country Study: Kazakhstan.....</b>	<b>80</b>
11.1. Introduction .....	80
11.2. Trade and Production structure of Kazakhstan.....	80
11.3. Results .....	83
11.3.1. Real Income Effects .....	83
11.3.2. Changes in sectoral output in Kazakhstan .....	84
11.3.3. Effects on bilateral trade flows .....	84
11.3.4. Other Macroeconomic Results.....	87
11.3.5. Terms of Trade Effects .....	88
11.4. Conclusions .....	89
<b>12. Country study: Kyrgyzstan .....</b>	<b>91</b>
12.1. Introduction .....	91
12.2. Trade and Production structure of Kyrgyzstan .....	91
12.3. Results .....	94
12.3.1. Real Income Effects .....	94
12.3.2. Changes in sectoral output in Kyrgyzstan.....	95
12.3.3. Effects on bilateral trade flows .....	96
12.3.4. Other Macroeconomic Results.....	99
12.3.5. Terms of Trade Effects .....	100
12.4. Conclusions .....	101
<b>13. Country Study: Russia.....</b>	<b>102</b>
13.1. Introduction .....	102

13.2. Trade and Production structure of Russia.....	102
13.3. Results.....	106
13.3.1. Real Income Effects .....	106
13.3.2. Changes in sectoral output in Russia .....	106
13.3.3. Effects on bilateral trade flows .....	107
13.3.4. Other Macroeconomic Results .....	110
13.3.5. Terms of Trade Effects .....	111
13.4. Conclusions.....	112
<b>14. Country Study: Ukraine .....</b>	<b>114</b>
14.1. Introduction.....	114
14.2. Trade and Production structure of Ukraine.....	114
14.3. Results.....	117
14.3.1. Real Income Effects .....	117
14.3.2. Changes in sectoral output in Ukraine .....	118
14.3.3. Effects on bilateral trade flows .....	119
14.3.4. Other Macroeconomic Results .....	122
14.3.5. Terms of Trade Effects .....	123
14.4. Conclusions.....	123
<b>References.....</b>	<b>125</b>

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## **Abstract**

We evaluate the effects of potential measures to liberalize trade between the EU and the CIS using a computable general equilibrium (CGE) model. We look at the CIS as an aggregate and we also present results for individual CIS countries. Our CGE model takes different underlying industry specific market structures and elasticities into account. Furthermore, the model incorporates estimated non-tariff trade barriers to trade in services. The results are compared to a baseline which incorporates recent developments in the trade policy environment, i.e. the phase out of ATC, enlargement of the EU and CIS accessions to the WTO. The analysis takes agricultural liberalization, liberalization in industrial tariffs, and liberalization in services trade as well as trade facilitation measures into account. While there is important heterogeneity in the impact of FTAs on individual countries, the results indicate that the CIS as a whole would experience a negative income effect if the FTA would be limited only to trade in goods. This implies that the CIS would most likely to benefit from an FTA with the EU if it would incorporate deeper form of integration not being limited to liberalization of tariffs in goods.

# 1. Introduction

One of the EU's most important trading partners is Russia. Russia has been the EU's third most important export and import partner with 10% of total EU external imports originating from Russia and about 6% of EU external exports going to Russia. Other countries of the Commonwealth of the Independent States (CIS)<sup>1</sup> play a much less important role in the EU's trade relations with about 2.5% of total EU external exports and imports originating from the other countries in the region<sup>2</sup>.

With the 2004 and 2007 EU enlargements the physical border of the EU shifted towards East and several of the CIS countries (Russia, Ukraine, Belarus and Moldova) are now immediate neighbors of the EU. In case of a Turkish enlargement, Armenia, Azerbaijan and Georgia would also become neighboring countries. Although they have no serious prospect of acceding to the EU, political and economic relations with these countries are important. The European Commission proposed a 'differentiated, progressive, and benchmarked approach' to the new neighbors which was specified in the European Neighborhood Policy (ENP) Strategy Paper<sup>3</sup>. On the basis of this strategy paper bilateral action plans were agreed with each participating country. The ENP aims, among other things, to create grounds for possible further trade liberalization and for gradual participation in the Internal Market.

The ENP was not extended to Central Asian states, however, the European Commission adopted a Strategy for Central Asia in 2002. Furthermore Russia was also left out from the ENP and a bilateral, EU-Russian partnership was developed. One of the main pillars of this partnership is the creation of a Common Economic Space which implies the development of an open and integrated market between the EU and Russia.

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<sup>1</sup> Throughout the study we will refer to the twelve successor countries of the former Soviet Union as CIS.

<sup>2</sup> Based on 2006 data from Eurostat.

<sup>3</sup> It was approved by the Council in June 2004 in the Council of the European Union Presidency Conclusions 10679/2/04.

Energy plays also a central role in EU-CIS economic relations. The EU is significantly dependent on import of the CIS energy resources, mainly from Russia. About 60% of EU gas imports are expected to come from Russia by 2030<sup>4</sup>.

The purpose of this study is to evaluate the effects of potential measures to open trade between CIS and the EU. In so doing, we employ a computable general equilibrium model. The model follows recent development in trade theory in taking industry specific market structures and elasticities into account. Furthermore, we employ estimates on tariff equivalent for the service sector, which are obtained through econometric estimations.

As several CIS countries currently are negotiating WTO accession, the model's baseline has been modified to take these accessions into account.

The rest of the study is organized as follows, Chapter 2 offers a general background to the production and trade structure of the EU and the CIS, Chapter 3 describes the theoretical background of the model, the data used and the set up of the analysis. The discussion of results is presented in Chapter 4 of the study. Concluding comments can be found in Chapter 5.

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<sup>4</sup> Communication for the European Commission to the European Council and the European Parliament. An Energy Policy for Europe, Brussels, 10.1.2007 COM(2007).

## **2. Trade and Production Structure of the EU and CIS**

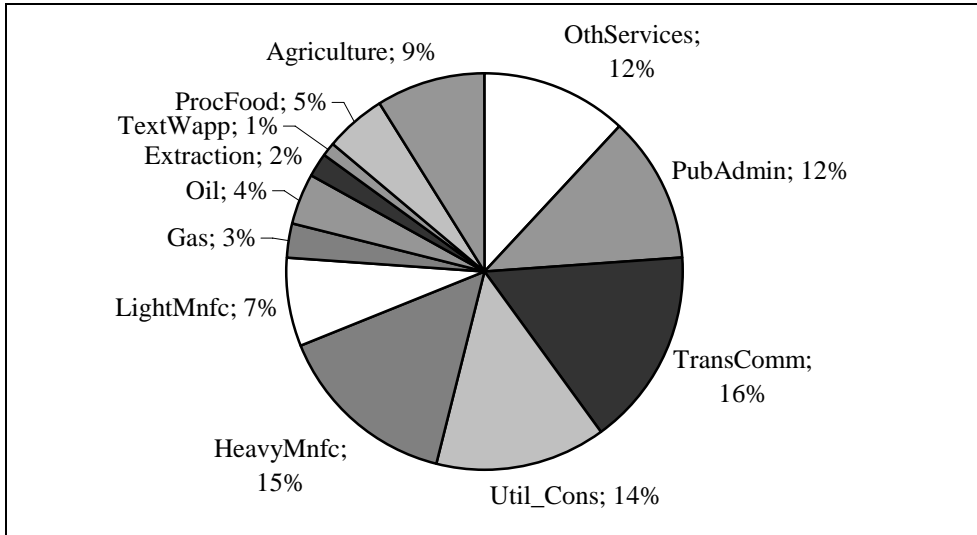
The aim of this chapter is to give an overview of the underlying patterns of production and trade structure of the EU and CIS, with special attention given to the nature of bilateral trade.

### **2.1. Trade and Production structure of the CIS countries**

About 54% of output in the CIS economies is concentrated in services. Oil, gas, and other mineral extractions all together represented about 9% of total output on average in the CIS in 2004 which is depicted in Figure 2.1. Heavy manufacturing (which includes petroleum, coal products, chemical, rubber, plastic prods, mineral products, ferrous metals, metals, electronic equipment, machinery and equipment, and manufactures nec) contributes 15% of output. Output in light manufacturing sectors is only about half of the output share of the heavy manufacturing sectors. The agricultural output together with output in the processed food sector represents about 14% of total output.

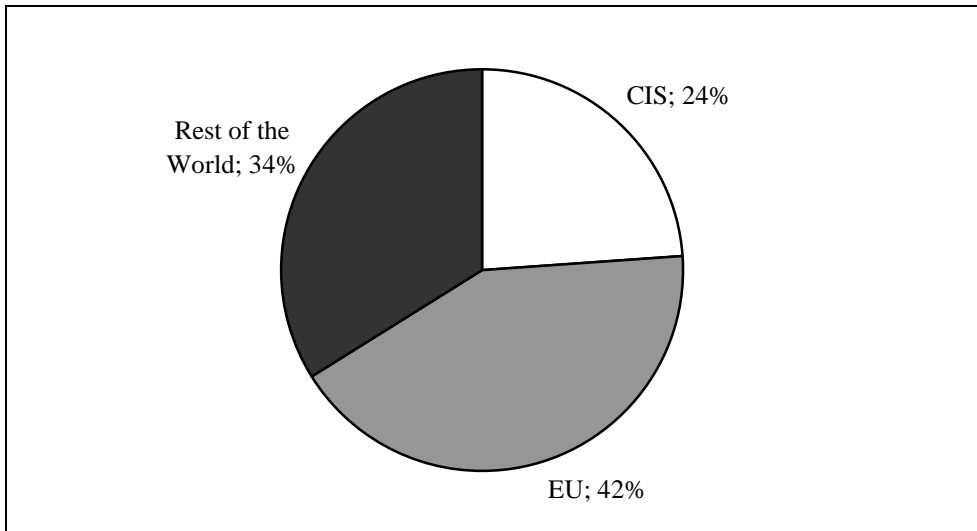
Figure 2.2 shows the share of three main regions in CIS's imports including intra-region imports. While about 24% of imports are coming from other countries in the region, imports from the EU countries are almost the double of those arriving from intra-regional origins. The magnitude of imports coming from the EU indicates that for many countries in the region the EU is a very important trading partner. Moreover, for the region as a whole the EU is a more important trading partner than intra-regional trade. Therefore preferential agreements with the EU could have more important effects on some of the CIS economies than agreements within the region.

**Figure 2.1. Share of sectors in the output of CIS countries in 2004**



Source: own calculations, data come from GTAP database version 7.

**Figure 2.2. Share of regions in CIS imports in 2004**



Source: own calculations, data come from GTAP database version 7.

The importance of different countries in CIS exports and imports for the year 2006 is presented in Table 2.1. The EU is by far the most important export and import partner for the region with almost 40% of total imports originating from the EU and about half of total exports going to the EU. The second and the fourth most important trading partner for the CIS are within the region. Russia is the sec-

ond most important export and import partner with 16.8% of imports originating from Russia and about 5.2% of exports going to Russia. The fourth most important trading partner is Ukraine. Other countries which play a relatively important role in the intra-CIS trade relations are Kazakhstan and Turkmenistan.

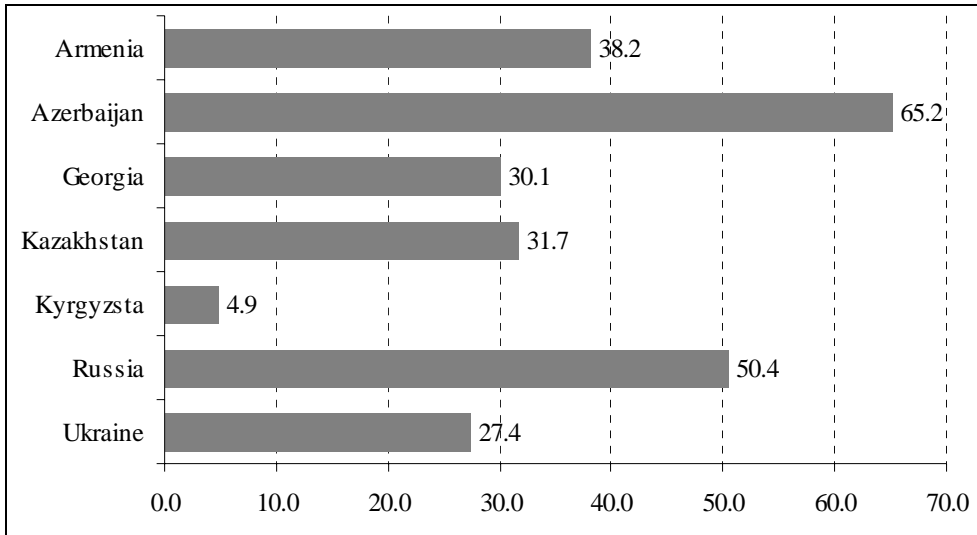
**Table 2.1. CIS's major trading partners (merchandise) 2006**

Imports				Exports			
	Partner	Millions of Euro	% of total		Partner	Millions of Euro	% of total
	<i>World</i>	<i>1,350,494</i>	<i>100.0</i>		<i>World</i>	<i>1,166,109</i>	<i>100.0</i>
1	EU	82,659	38.7	1	EU	169,341	52.6
2	Russia	35,873	16.8	2	Russia	16,622	5.2
3	China	21,098	9.9	3	China	16,264	5.1
4	Ukraine	10,534	4.9	4	Ukraine	15,794	4.9
5	Japan	7,348	3.4	5	Turkey	15,333	4.8
6	USA	7,318	3.4	6	USA	10,319	3.2
7	Korea	7,063	3.3	7	Switzerland	10,141	3.2
8	Turkey	5,432	2.5	8	Kazakhstan	8,445	2.6
9	Kazakhstan	4,156	1.9	9	Romania	4,673	1.5
10	Turkmenistan	3,289	1.5	10	Japan	4,226	1.3
11	Belarus	3,070	1.4	11	Iran	4,136	1.3
12	Brazil	2,973	1.4	12	Belarus	3,655	1.1
13	Uzbekistan	1,873	0.9	13	Bulgaria	3,217	1.0
14	Switzerland	1,596	0.7	14	India	3,181	1.0
15	India	1,396	0.7	15	Korea	1,992	0.6
16	Norway	1,178	0.6	16	Azerbaijan	1,879	0.6
17	Romania	1,092	0.5	17	Egypt	1,847	0.6
18	Malaysia	976	0.5	18	Israel	1,412	0.4
19	Canada	968	0.5	19	Uzbekistan	1,392	0.4
20	Azerbaijan	900	0.4	20	Moldavia	1,331	0.4

Source: Eurostat, COMEXT database.

The importance of the EU as export destination for different countries in the region is shown in Figure 2.3. While the EU is a very important export destination for the region as a whole there are important differences between countries. EU is the export destination for about two-thirds of Azerbaijan's exports and also about half of Russia's exports. On the other hand only about 5% of Kyrgyzstan's exports are going to the EU.

Figure 2.3. Share of exports to the EU in 2004<sup>5</sup>



Source: UNCTAD.

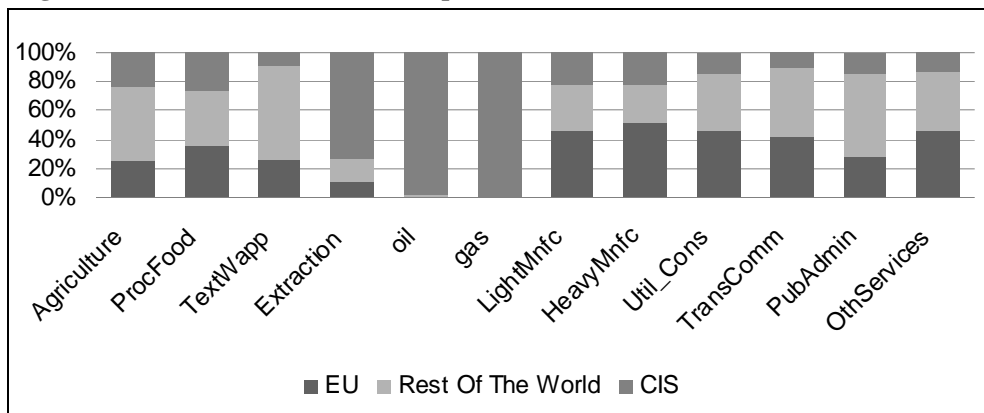
Figure 2.4 shows the share of different sectors in CIS imports originating from the EU, rest of the world and intra-regional sources. Oil and gas is imported almost only from intra-regional sources in the CIS countries. Similarly to oil and gas, the majority of other mineral extractions are originating from other CIS countries. Imports from the EU are most important in light and heavy manufacturing industries. In heavy manufacturing sectors about half of the imports originate from the EU. Furthermore, trade in some services sectors is important with the EU. Imports from countries other than CIS and EU countries are significant in agriculture products, processed food and most importantly in textiles and clothing products. In the latter sector more than half of the imports are coming from other countries than the EU or other CIS countries.

Figure 2.5 depicts the importance of different sectoral imports of CIS countries from the EU. An important part of imports originating from the EU is concentrated in heavy manufacturing products which presents 46% of total imports. Light manufacturing products are also important in imports from the EU. On the other hand agricultural and processed food products represent a smaller share. While agricultural products represent about 3% of total CIS imports from the EU, processed food products amount for a slightly higher share and represent 5% of total

<sup>5</sup> For the rest of the analysis we will only have Ukraine, Russia, Kyrgyzstan, Kazakhstan, Georgia, Azerbaijan and Armenia as separate countries, the other CIS will be aggregated up as rest of CIS (XSU) give the unavailability of individual country data at the current version of the GTAP.

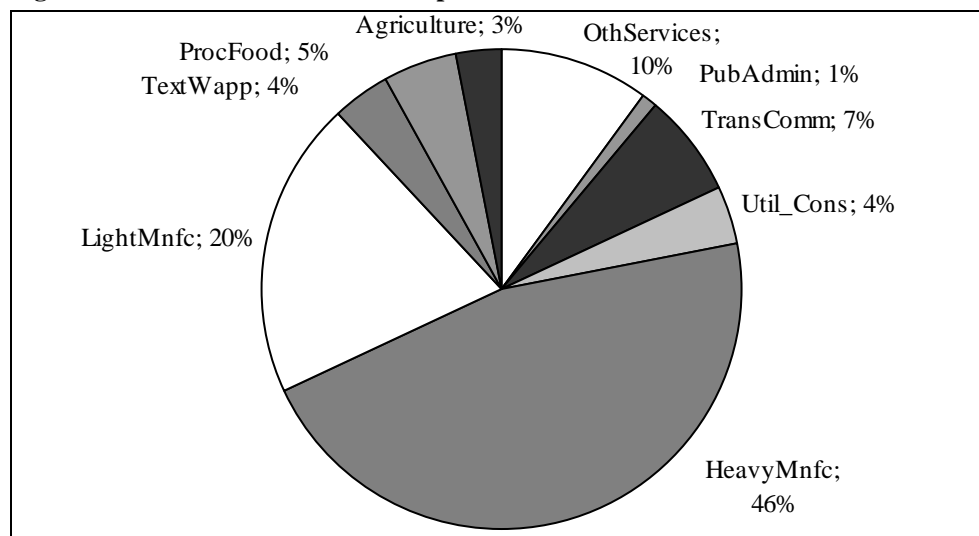
imports. CIS countries do not import oil, gas and other mineral extractions from the EU and imports in textiles and apparel also represent only around 4% of total imports.

**Figure 2.4. Share of sectors in CIS imports in 2004**



Source: own calculations, data come from GTAP database version 7.

**Figure 2.5. Share of sectors in CIS imports from the EU in 2004**



Source: own calculations, data come from GTAP database version 7.

The tables below presents import tariffs in the CIS countries in different sectors. Although there are some important differences in the magnitude of the tariffs the tariff structure of the different countries in the region is relatively similar. The highest import protection occurs in most of the countries in processed food prod-



ucts followed by protection in textiles and clothing and agriculture. Import tariffs are also higher in light manufacturing products while tariffs are very low or zero in extractions, gas and oil. While the structure of tariffs is relatively similar between the countries in the region, Ukraine has the highest tariffs followed by Russia. For almost all the countries the processed food sector is the most protected, however the magnitude of tariffs are different ranging from 33% in Ukraine to 9% in Armenia.

**Table 2.2. Import tariffs of CIS countries in 2004 (%)**

	<b>Russia</b>	<b>Ukraine</b>	<b>Kazakhstan</b>	<b>Kyrgyzstan</b>	<b>Armenia</b>	<b>Azerbaijan</b>	<b>Georgia</b>
Agriculture	12.5	23.0	7.3	4.1	7.1	15.8	11.7
ProcFood	15.4	33.3	12.5	12.5	9.0	11.1	12.0
TextWapp	16.6	5.9	7.6	13.1	8.5	16.9	12.0
Extraction	4.0	1.0	2.2	4.5	0.0	3.3	11.2
Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LightMnfc	14.8	8.2	11.8	9.0	4.4	10.2	8.7
HeavyMnfc	9.0	7.7	3.0	5.5	0.9	5.5	7.0
Util_Con	0.4	0.0	0.0	0.0	0.0	0.0	0.0
TransComm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PubAdmin	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OthServices	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	6.1	6.6	3.7	4.1	2.5	5.2	5.2

Source: own calculations, data come from GTAP database version 7.

## **2.2. Trade and Production structure of the EU**

Russia is one of the most important trading partners of the EU while other CIS countries play a rather small role in the EU's trade relations. As can be seen from Table 2.3, on the import side, Russia is the EU's third largest trading partner. Looking at exports, Russia is the destination for close to 6.2 % of the EU's exports, making it also the third largest export partner. On the other hand, only a small share of EU imports originates from the rest of the CIS region. Only about 2.5% of EU exports go to the rest of the CIS and about the same share originates from these countries.

**Table 2.3. EU's major trading partners (merchandise) 2006**

Imports				Exports			
	Partner	Millions of Euro	% of total		Partner	Millions of Euro	% of total
	<i>World</i>	<i>1,350,494</i>	<i>100.0</i>		<i>World</i>	<i>1,166,109</i>	<i>100.0</i>
1	China	191,769	14.2	1	USA	267,895	23.0
2	USA	176,514	13.1	2	Switzerland	86,752	7.4
3	<i>Russia</i>	<i>137,022</i>	<i>10.1</i>	3	<i>Russia</i>	<i>71,944</i>	<i>6.2</i>
4	Norway	79,061	5.9	4	China	63,361	5.4
5	Japan	76,483	5.7	5	Turkey	46,457	4.0
6	Switzerland	70,898	5.2	6	Japan	44,656	3.8
7	Turkey	38,538	2.9	7	Norway	38,170	3.3
8	Korea	38,334	2.8	8	Romania	27,297	2.3
9	Brazil	26,280	1.9	9	Canada	26,521	2.3
10	Taiwan	26,127	1.9	10	United Arab Emir.	24,704	2.1
11	Libya	25,763	1.9	11	India	24,061	2.1
12	Algeria	23,970	1.8	12	Korea	22,780	2.0
13	Saudi Arabia	23,511	1.7	13	Hong Kong	21,576	1.9
14	India	22,361	1.7	14	Australia	21,298	1.8
15	Canada	19,565	1.4	15	South Africa	19,852	1.7
16	Singapore	19,398	1.4	16	Singapore	19,459	1.7
17	South Africa	18,431	1.4	17	Mexico	19,022	1.6
18	Malaysia	17,699	1.3	18	Ukraine	17,834	1.5
	<i>CIS</i>	<i>171,021</i>	<i>12.7</i>		<i>CIS</i>	<i>104,230</i>	<i>8.9</i>

Source: Eurostat, COMEXT database.

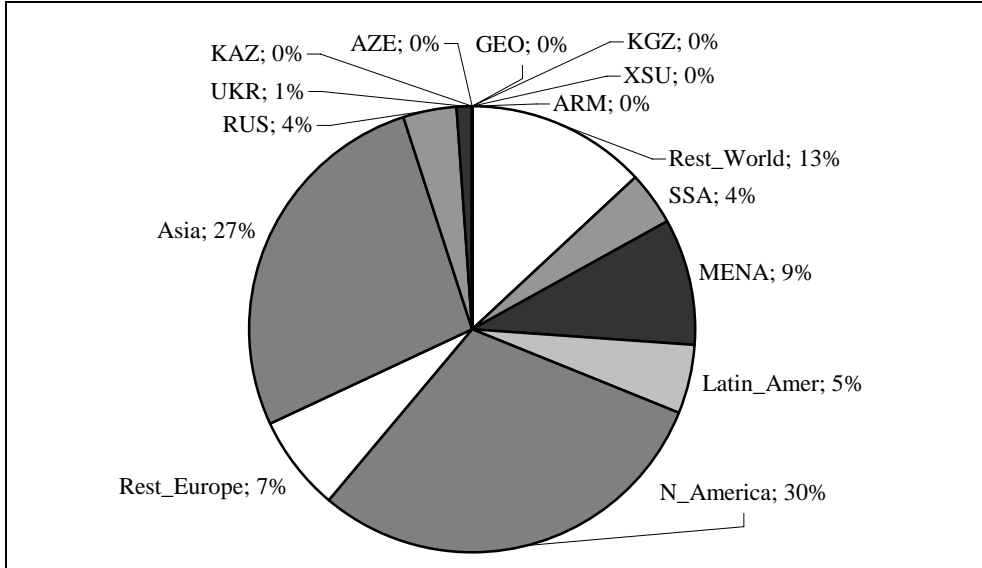
The share of different regions in EU exports for the year 2004 is presented in Figure 2.6. While Russia is the third most important trading partner of the EU regarding the value of trade, the CIS as a region represent a smaller part of export destination compared to other regions. The two most important export destinations for the EU are North-America and Asia.

In 2004 a bit more than 5% of EU exports went to the CIS countries from which Russia received 4%, Ukraine 1% and the rest of the exports went to other countries in the region with each country receiving less than 1%. Exports towards the region and specially Russia increased from 2004 to 2006 which can be seen in the figures in Table 2.3.

Similarly to exports, the CIS region as a whole provided a bit more than 5% of EU imports in 2004. The importance of the region as a trade partner is relatively small compared to some other regions. Nevertheless, Russia's importance when compared to other individual trading partners is very significant both as an import and as an export destination. The two most important import partners for the EU are North America and Asia. While North America is more important export part-

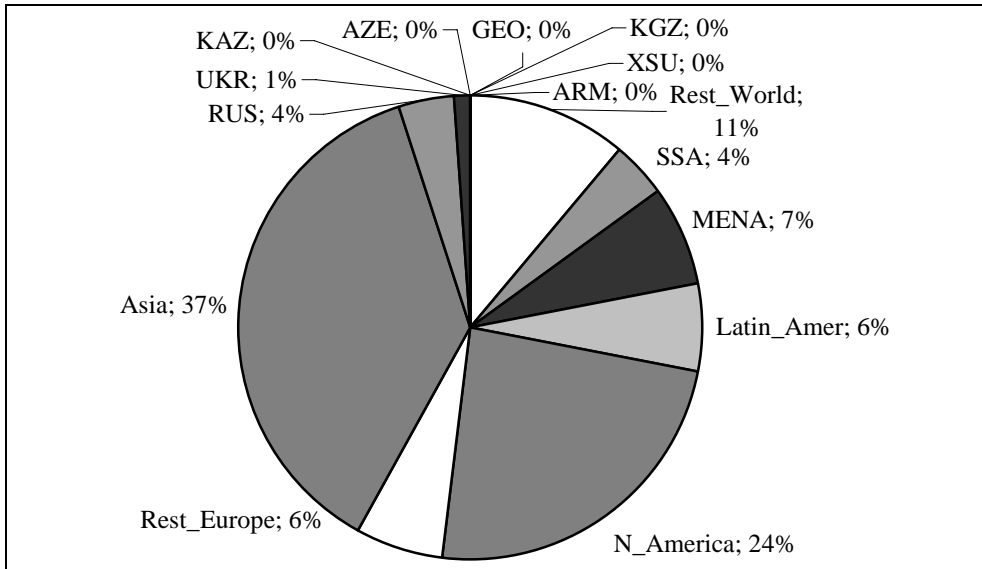
ner than Asia, imports from Asia represent a higher share of total imports than imports from North America.

**Figure 2.6. Share of different regions in EU exports**



Source: own calculations, data come from GTAP database version 7.

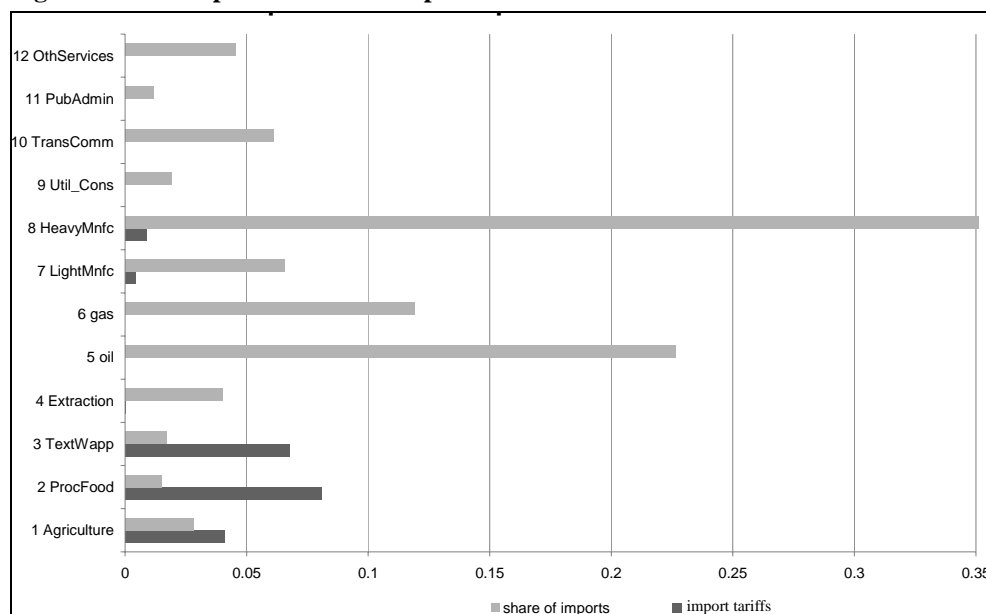
**Figure 2.7. Share of different regions in EU imports**



Source: own calculations, data come from GTAP database version 7.

Figure 2.8 depicts the share of imports in different sectors from the CIS countries together with import tariffs in those sectors in percentages. The most protected sectors in the EU, similarly to CIS countries are processed food followed by textiles and apparel and agriculture. These sectors have the lowest share of imports in total imports from the CIS countries. The most important part of imports consists of heavy manufacturing products (representing about 35% of total imports), oil (23% of total imports) and gas (12% of total imports) where tariffs are close to zero. Based on these figures one would expect only very limited benefits of an FTA if it would be limited only to reduction of tariffs given the current trade structure of the CIS.

**Figure 2.8. EU import tariffs and imports from CIS countries**



Source: own calculations, data come from GTAP database version 7.

## **3. The Model and the Data**

In this chapter, we aim to describe the model and the data on which we base our analysis. Furthermore, we describe the general outline of the analysis defining underlying assumptions as well as the employed scenarios.

### **3.1. The CGE model**

The methodology used in this study is comparable with recent policy analyses of the World Bank, the IMF and the OECD, incorporating a similar quantitative modeling framework. This section provides a brief overview of the global computable general equilibrium (CGE) model used in this study.

The CGE-model is based on an input-output structure (which stem from national input-output tables) which explicitly links industries through chain of value added in production, from primary goods, through stages of intermediate processing, to the final assembling of goods and services for consumption. This intersectoral linkage works both through direct linkages, e.g. the use of steel in the production of transport equipment, and indirect, i.e. via intermediate use in other sectors. These linkages are captured in the model by the usage of firms' use of factors and intermediate inputs. An overview of the model is provided in Box 3.1 below, while a more detailed description is available in the Technical Annex.

Recent developments in international trade and economic geography focuses on the importance of scale economies (e.g. starting from Krugman (1979), (1980), Helpman and Krugman (1989) and onwards) and imperfect competition in determining the patterns of production and trade. In order to incorporate this development into the analysis, our model is expanded to take differences in underlying market structures across sectors into account.

Furthermore, in order to further increase the quality of the analysis, we employ estimates on elasticities as reported in the recent paper by Antweiler and Trefler (2002).

Impediments to trade in services are not as clearly visible as is the case with tariffs for trade in merchandise. Rather, trade barriers in the service sector often entail prohibitions, quantitative restrictions and government regulations, which are designed to limit the market access of foreign suppliers. These are not easy to quantify. In order to remedy this lack of data, we follow Francois and Copenhagen Economics (2007) in estimating tariff equivalents for the service sector through the use of a gravity type equation. These estimates are then incorporated into the analysis. Further information about these estimates is available in the Technical Annex.

### **Box 3.1. Overview of the model**

The model employed in this study is a global, multi-regional, multi-sectoral general equilibrium model. In each region, there is a single representative household, which allocates its expenditures over personal consumption today and savings (future consumption). The representative household owns all production factors and receives income by selling them to firms. It also receives income from tariff revenues. Part of the income is distributed as subsidy payments to some sectors.

On the production side, firms use domestic production factors (capital, labor and land) and intermediate inputs from domestic and foreign sources to produce outputs in the most cost-efficient way that technology allows. Factor markets are competitive, and labor and capital are mobile between sectors but not between regions.

Perfect competition is assumed in 16 of our 36 sectors. In these sectors, products from different regions are assumed to be imperfect substitutes in accordance with the so-called 'Armington' assumption. In the remaining sectors, we assume imperfect competition. The approach followed involves monopolistic competition. Monopolistic competition entails scale economies that are internal to each firm, depending on its own production level. In particular, based on estimates of price-cost mark-ups, we model the sector as being characterized by Chamberlinian large-group monopolistic competition. An important property of the monopolistic competition model is that increased specialization at intermediate stages of production yields returns due to specialization, where the sector as a whole becomes more productive the broader the range of specialized inputs. These gains spill over through two-way trade in specialized intermediate goods. With these spill-over effects, trade liberalization can lead to global scale effects related to specialization. With international scale economies, regional welfare effects depend on a mix of efficiency effects, global scale effects, and terms-of-trade effects. Similar gains follow from consumer goods specialization.

Prices on goods and factors adjust until all markets are simultaneously in (general) equilibrium. This means that we solve for an equilibrium in which all markets clear. While we model changes in gross trade flows, we do not model changes in net international capital flows. Rather our capital market closure involves fixed net capital inflows and outflows.

A full description of the model is provided in the technical appendix.

### 3.2. Model data

The GTAP database, version 7, provides the majority of the data for the empirical implementation of the model. The database is the best and most updated source for internally consistent data on production, consumption and international trade by country and sector. For more information, please refer to Dimaranan and McDougall (2006).

The GTAP version 7 dataset is benchmarked to 2004, and includes detailed information on input-output, trade and final demand structures for the whole world this year. However, there are some important changes to the trade policy environment that have happened since then, that we wish to include in the basic dataset. Therefore, before conducting any policy experiments, we first run a ‘pre-experiment’, where we include the ATC (Agreement on Textile and Clothing) phase-out and EU enlargement. Moreover, several of the CIS countries are currently in the process of joining the WTO. The EU would most probably only negotiate FTAs if the given partner country would already be a WTO member. Therefore, we implement the result from WTO accessions of all non-WTO members of CIS as well in our baseline.

For the purpose of this study, the GTAP database has been aggregated into 16 regions and 12 sectors. The list of sectors and regions is shown in Table 3.1.

**Table 3.1. Sectors in the model**

<b>Sectors</b>	<b>Regions</b>
Agricultural products, food	Russia
Processed Food	Ukraine
Textiles and Clothing	Kazakhstan
Coals and other minerals	Kyrgyzstan
Oil	Armenia
Gas	Azerbaijan
Light Manufacturing	Georgia
Heavy Manufacturing	Rest of Former Soviet Union
Utilities and Construction	East, Southeast and South Asia
Transport and Communication	Rest of Europe
PubAdmin/Defence/Health/Educat	North America
Other Services	Latin America
	European Union 25
	Middle East and North Africa
	Sub-Saharan Africa
	Rest of World

### 3.3. Setting up the analysis; baselines and trade liberalization scenarios

All results are compared to the baseline, which takes into account the effects of a successful WTO accession, the EU enlargement and the phase-out of the ATC. The baseline scenario is discussed in greater detail in the Annex I. The core of our analysis is structured around a set of scenarios. We simulate these three scenarios assuming that all CIS countries have the same FTAs with the EU. These scenarios are based on alternative liberalization approaches for agriculture, manufactured goods and services trade, as well as measures to facilitate trade. Trade facilitation measures aim to reduce less transparent trade barriers, such as customs procedures, product standards and conformance certifications, licensing requirements, and related administrative sources of trading costs. The scenarios which we use as basis for our analysis are summarized in the table below.

The partial trade agreements imply more realistic outcomes of the trade negotiations than the Full FTA scenario described above. With regards to the outcome of the bilateral trade agreements on non-food, the assumption is the same as in the full FTA, namely full bilateral tariff reduction. The second partial trade agreement scenario offers a deeper liberalization between the regions implying full bilateral reduction in not only manufacturing goods but also in the food sector. No trade facilitation is assumed to take place in the partial scenarios.

The Full FTA agreement implies full bilateral tariff reductions for manufacturing goods, full bilateral tariff reductions in the agriculture and processed food sectors, full liberalization of trade in services and trade facilitation measures corresponding to 2 % of value of trade. From a policy point of view, this scenario can be seen as quite radical in its assumptions. Nonetheless it is very useful in providing an upper benchmark for the effect of potential measures to liberalize trade.

**Table 3.2. Scenarios**

Nr	Description	Assumptions			
		Food	Non-food	Services	Trade facilitation
1	Partial 1 trade agreement	No tariff reductions	Full bilateral tariff reductions	No reduction	None
2	Partial 2 trade agreement	Full bilateral tariff reductions	Full bilateral tariff reductions	No reduction	None
3	Full FTA	Full bilateral tariff reductions	Full bilateral tariff reductions	Full services liberalisation <sup>6</sup>	2% of value of trade

<sup>6</sup> We assume an average trade restriction reduction (TCE or trade cost equivalent) for producer services of 23.7 percent in the CIS and 18.4 percent in the EU27 based on the findings of Francois et al (2007). See further details in the Technical Annex.



## 4. Results

### 4.1. Real Income Effects

Trade liberalization has a small positive net income effect on the EU amounting to 0.2% increase under the full FTA scenario which is shown in

Table 4.1. On the other hand the CIS on average would experience a negative income effect under the first two scenarios and a positive effect under the third scenario. The gains from liberalization for the EU is the highest under the full FTA scenario and very similar in magnitude under the first two scenarios. The CIS countries would experience a higher decrease in real income in case of the second scenario which would involve not only liberalization in manufacturing but also agricultural sectors. This latter scenario would mean a 0.83% decrease in real income on average in the CIS countries. These negative income effects are mainly due to the important negative terms of trade effects taking place in Russia and Ukraine. On the other hand, full liberalization would imply a 0.62% increase in real incomes in the CIS on average. This increase in real incomes will be about three times higher than the increase which would take place in the EU under this third scenario.

**Table 4.1. Real Income Effects (percentage change from baseline)**

Scenario	Partial 1 trade agreement	Partial 2 trade agreement	Full FTA
EU	0.14	0.13	0.21
CIS	-0.53	-0.83	0.62

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

### 4.2. Effects on Sectoral Outputs

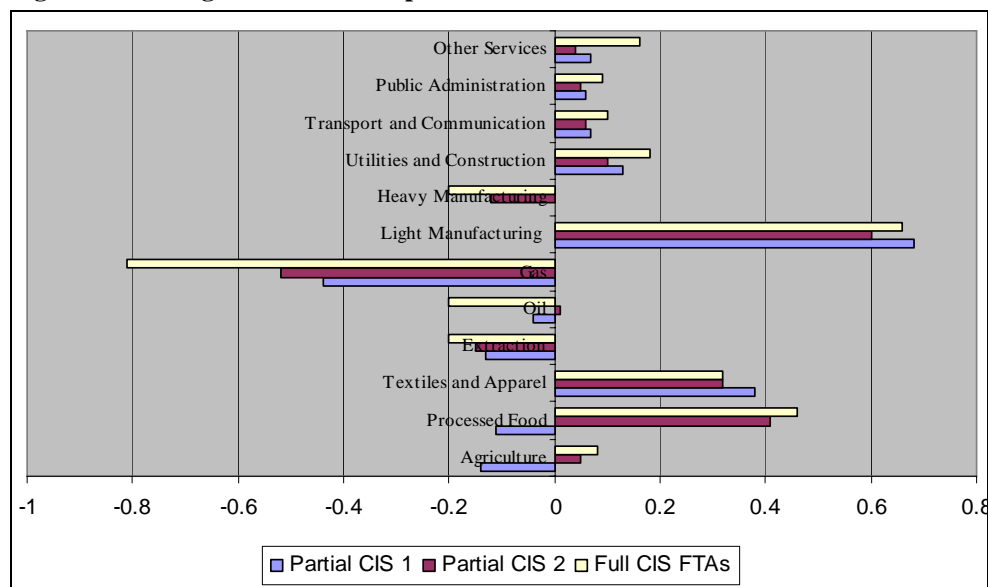
Our analyses of the expected changes in sectoral output as a result of different forms of trade liberalization show that while the effects for the EU would be very

small, important changes would occur in the sectoral output of CIS countries. More precisely, a small increase in textiles and apparel, light manufacturing, processed food and agriculture output would take place combined with a small reduction in other sectors. On the other hand, CIS countries on average would experience an important drop in light manufacturing sectors and increase in heavy manufacturing and textiles and apparel output. The next two subsections discuss the changes in sectoral output in more details.

#### 4.2.1. Changes in sectoral output in the EU

The figure below shows changes in sectoral output for the EU under the three different scenarios. The results below depict changes compared to the baseline scenario which assumed that CIS countries joined the WTO, the ATC and the EU enlargement took place. These results would occur if the EU would have FTAs with all CIS countries. As can be seen from the figure below, which depicts percentage changes, the effects of different FTAs on EU's output structure would be rather limited.

**Figure 4.1. Changes in sectoral output of the EU under the three different scenarios**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

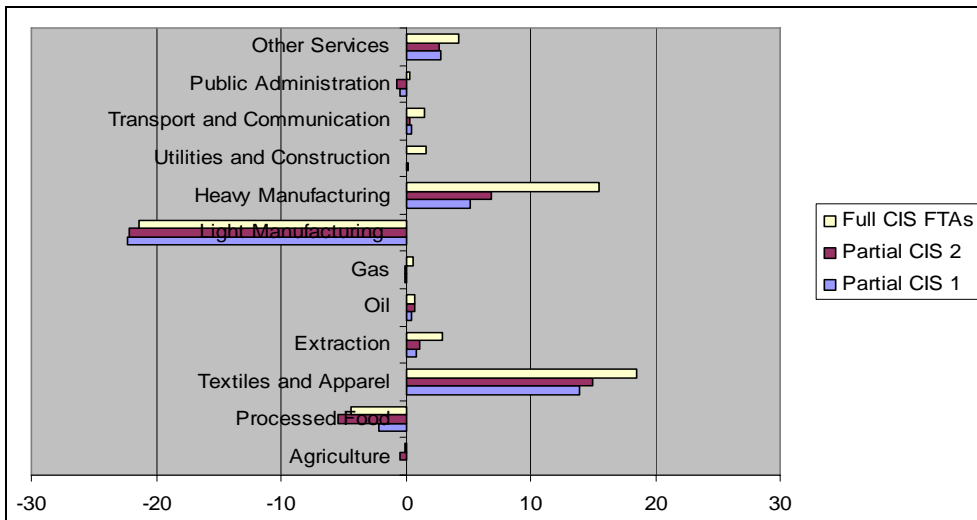
The most important increase in sectoral output would occur in the light manufacturing sectors with an increase of about 0.6-7%. Moreover, textiles and apparel production would also increase somewhat. Finally, there would be an increase in agricultural and processed food sectors if the trade agreements would incorporate more than just liberalization in manufactured goods.

Some of the sectors would experience small reductions in output. The most important reduction in sectoral output would happen in the gas sector, with a decrease of about 0.8% in case of full CIS free trade agreements. Some very small reductions would take place in heavy manufacturing, oil and other extraction outputs.

#### 4.2.2. Changes in sectoral output in the CIS

The changes which would occur after trade liberalization between the CIS and EU would be much more pronounced for the CIS countries than for the EU. Average changes in the CIS after the three different FTAs would take place are shown in Figure 4.2.

Figure 4.2. Changes in sectoral output of the CIS under the three different scenarios



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The most pronounced decrease would take place in the light manufacturing sectors with the drop in the production being slightly less pronounced in case of full liberalization. The decrease of production would be around 22%. The other

sector where reduction of sectoral output would occur is the processed food sector. However, in this sector the output drop would be smaller, in the magnitude of 2-6% depending on the form of trade agreements.

The sectors where important increases in sectoral output would take place are the heavy manufacturing sectors and textiles and apparel. For both sectors the biggest increases would occur in case of full FTAs. While output in textiles and apparel would increase by about 18%, heavy manufacturing output would increase by about 15% under the deepest form of FTA. The increase in heavy manufacturing production would be less than half in case of the partial FTA scenarios.

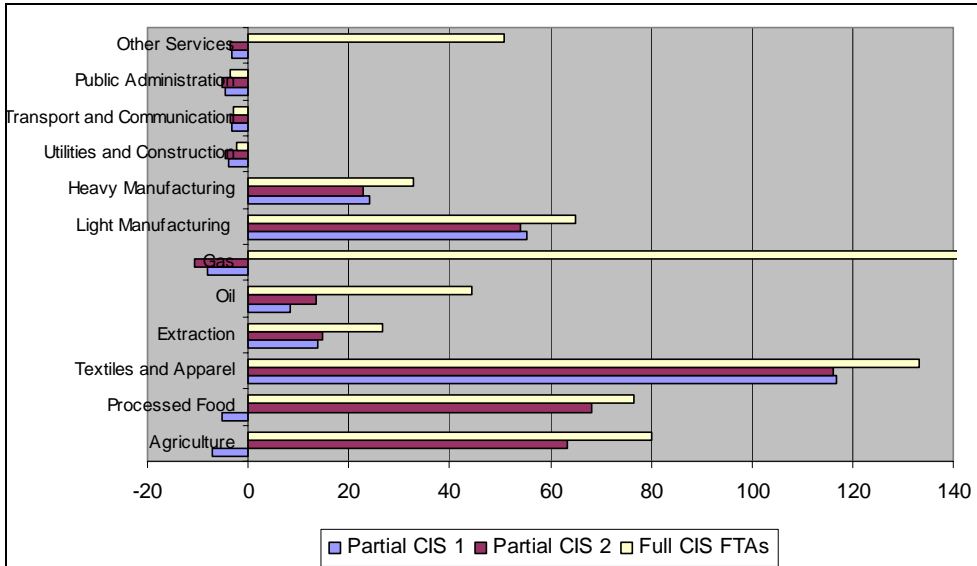
### **4.3. Effects on bilateral trade flows**

In this section we provide detailed results on trade impacts in the three scenarios, and we present the changes in trade flows by sector.

The Figure 4.3 depicts changes in EU exports towards CIS countries after the three different FTA scenarios. The services sectors experience a small reduction in the first two scenarios. Under the third scenario, trade in services sectors belonging to 'other services' is liberalized. As a consequence of this there would be an important, about 50% increase in EU exports in other services sectors towards the CIS countries. Important increase would occur in exports of textiles and apparel under all scenarios, the biggest increase occurring under the third scenario. The exports in these sectors would more than double towards the CIS countries. Light manufacturing exports would also increase about 50-60% depending on the scenarios. When trade liberalization would occur also in agriculture and processed food sectors, these sectors would also experience an important increase in their exports towards the region. There would be an increase in gas exports, which according to the graph is important in terms of percentage change compared to the baseline scenario. The table below shows the percentage changes compared to the baseline together with the share of exports in each sector. The share of gas and oil sector's exports is close to zero, thus the increase shown in the graph in the exports of gas towards the CIS countries in terms of levels is minimal.

Figure 4.4 shows percentage changes in exports of CIS by each sector towards the EU. Similarly to the case of EU exports in services, an important increase would occur in other services exports if trade would be liberalized between the EU and the CIS in these sectors.

**Figure 4.3. Changes in EU exports towards CIS countries after the three different FTA scenarios**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

**Table 4.2. Percentage changes in sectoral exports and the share of sectors in total exports in the baseline of the EU**

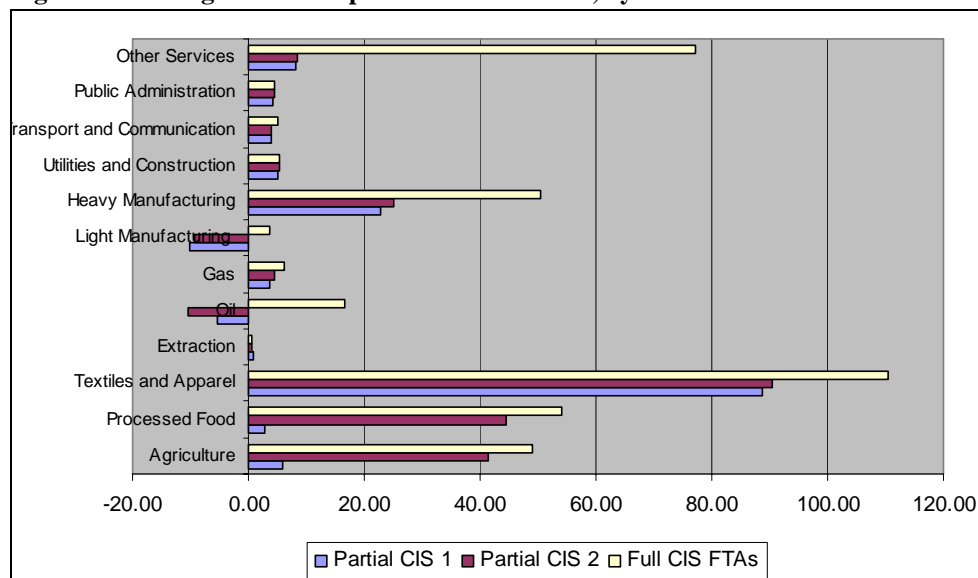
	Partial FTA 1	Partial FTA 2	Full FTAs	Share in total exports
Agriculture	-7.08	63.46	80.01	2.96%
Processed Food	-5.07	68.19	76.54	5.12%
Textiles and Apparel	116.70	116.23	133.38	4.15%
Extraction	13.93	14.88	26.72	0.35%
Oil	8.21	13.51	44.27	0.00%
Gas	-8.10	-10.70	262.78	0.00%
Light Manufacturing	55.42	54.14	65.05	19.38%
Heavy Manufacturing	23.95	22.93	32.74	45.12%
Utilities and Construction	-4.05	-4.59	-2.41	4.02%
Transport and Communication	-3.28	-3.62	-3.03	6.85%
Public Administration	-4.41	-5.17	-3.71	1.25%
Other Services	-3.36	-3.59	50.95	10.80%

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

While some reduction in exports would occur in light manufacturing sectors, exports in heavy manufacturing would increase by 23-25% under the two first scenarios and by 50% in case of full liberalization. Increase in exports of processed food and agricultural products would take place under all three scenarios,

the effect being small in case of no liberalization in agriculture and becoming important once liberalization in the agriculture and food sectors would also take place. The most pronounced increase would occur in the textiles and apparel sectors. Under the first and second scenarios, the increase would be around 88-90% and it would be around 110% in case of full liberalization.

**Figure 4.4. Changes in CIS exports towards the EU, by each sector**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

**Table 4.3. Percentage changes in sectoral exports and the share of sectors in total CIS exports towards the EU in the baseline**

	Partial FTA 1	Partial FTA 2	Full FTAs	Share in total exports
Agriculture	6.06	41.38	49.03	2.80%
Processed Food	2.85	44.65	54.11	1.54%
Textiles and Apparel	88.60	90.31	110.50	1.92%
Extraction	0.95	0.66	0.60	3.68%
Oil	-5.46	-10.39	16.60	21.11%
Gas	3.56	4.44	6.21	11.57%
Light Manufacturing	-10.13	-9.20	3.79	6.56%
Heavy Manufacturing	22.73	25.19	50.29	36.62%
Utilities and Construction	5.04	5.37	5.25	1.94%
Transport and Communication	3.86	4.06	5.16	6.19%
Public Administration	4.18	4.65	4.51	1.18%
Other Services	8.31	8.37	77.06	4.90%

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Table 4.3 shows the percentage changes in sectoral exports together with the share of each sector in total exports towards the EU in the baseline. Although the most important increase would occur in the textiles and apparel sector with exports to the EU increasing by 90-110% depending on the scenario, this sector only represents a small share in total exports (less than 2%). The second most important increase would occur in processed food followed by the increase in exports of agricultural products. Again, these sectors represent only a very small share of total exports therefore the change after the different FTAs in level would be very small.

#### 4.4. Other Macroeconomic Results

In this section other macroeconomic results, such as changes in wages and GDP are discussed. These results are summarized in Tables 4.4 and 4.5 below. Overall, these variables follow the general pattern previously pointed out; the impact of a trade agreement is higher for CIS than for the EU for all variables. The change in GDP indicates a much higher gain for the CIS than for the EU in case of full FTA however a decrease in case of the first two scenarios. These negative effects under the first two scenarios are mainly due to the important negative terms of trade effects taking place in Russia and Ukraine. The effects on worker wages are larger for the CIS in case of full FTA and rather small and similar in magnitude to those in the EU in case of the first two forms of FTAs implying less deep form of liberalization.

Table 4.4 below shows the resulting changes in some selected macroeconomic variables from a full FTA. There would be a rather small increase in GDP in the EU after a full FTA, amounting to 0.18%. On the other hand, the increase in the CIS would be more pronounced, the corresponding increase in the CIS is 1.2%.

**Table 4.4. Macroeconomic results from Full FTA (in %)**

	<b>EU</b>	<b>CIS</b>
Change in GDP	0.18	1.195
Unskilled worker wage	0.26	1.560
Skilled worker wage	0.24	1.470

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The increase in wages is also larger in the CIS than in the EU. The change in wages for skilled and unskilled workers is similar in magnitude in both regions.

While the EU would experience a marginal change of 0.2% in wages, the increase in CIS wages would be around 1.5% for both skilled and unskilled workers.

The results with regards to the effect on other macroeconomic variables of the more realistic scenarios of trade agreements are summarized in Table 4.5 below. These results are different not only in magnitudes but also the sign of change is reversed for the GDP of the CIS. While the full FTA would result in an increase in GDP, the first two scenarios with lower level of trade liberalization would imply a reduction in GDP for the CIS. On the other hand, the change for the EU would be positive, although rather small. The negative effect on GDP is higher in case of the second scenario which would involve also agriculture liberalization while being relatively small in the first case for the CIS countries.

The increase in wages is significantly smaller for the CIS under the first two scenarios than in the full FTA case, with the increase being much smaller for unskilled workers than for skilled workers. The increase in unskilled worker's wage in the CIS under the first two scenarios is rather small and close to those in the EU being around 0.16-0.22%.

**Table 4.5. Macroeconomic results from Partial 1 & 2 trade agreement**

	Partial 1 trade agreement		Partial 2 trade agreement	
	EU	CIS	EU	CIS
Change in GDP	0.12	-0.13	0.10	-0.35
Unskilled worker wage	0.18	0.22	0.18	0.16
Skilled worker wage	0.16	0.32	0.15	0.36

Source: Model simulations

Note: All results are reported as percentage change compared to baseline.

#### **4.5. Terms of Trade Effects**

The table below shows terms of trade effects in the case of full free trade agreement with liberalization not only related to agriculture and manufacturing products but also to services trade and reduction in technical barriers. While the EU would have a small terms of trade improvement amounting to about 0.11%, the CIS on average would experience 0.83% deterioration. The terms of trade deterioration results from the pre-FTA tariff structures which imply liberalization being undertaken mostly by CIS. In order to offset the surge in imports following the tariff cuts the CIS must increase exports. This tends to drive down export prices. As a consequence, CIS's terms of trade deteriorates.



**Table 4.6. Terms of trade results from Full FTA (in %)**

	<b>EU</b>	<b>CIS</b>
Terms of trade effects	0.11	-0.83

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The terms of trade effects for the two regions under the two other forms of trade liberalization are presented in the Table 4.7 below. The terms of trade gains for the EU would be slightly lower under the second partial trade agreement and the lowest under the first form of FTA. On the other hand the terms of trade deterioration would be the smallest for the CIS under the first scenario and slightly higher under the second, amount to a 0.76% decrease.

**Table 4.7. Terms of trade results from Partial 1 & 2 trade agreement**

	<b>Partial 1 trade agreement</b>		<b>Partial 2 trade agreement</b>	
	<b>EU</b>	<b>CIS</b>	<b>EU</b>	<b>CIS</b>
Terms of trade effects	0.09	-0.63	0.10	-0.76

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

## 5. Conclusions

In this study we explore the economic effects of potential measures to liberalize trade between the European Union and the CIS. In so doing, we have a Computable General Equilibrium Model, CGE Model, based on the most recent version of the GTAP data base, i.e. GTAP 7, which is benchmarked to data from 2004. Our CGE model follows recent research in trade theory in taking different underlying industry specific market structures and elasticities into account. Furthermore, the model incorporates estimated non-tariff trade barriers to trade in services, stemming from industry-specific gravity equation, which enhances the analysis of the service sector. The results are compared to a baseline which incorporates recent developments in the trade policy environment, i.e. the phase out of ATC, enlargement of the EU and CIS accessions to the WTO. The analysis takes agricultural liberalization, liberalization in industrial tariffs, and liberalization in services trade as well as trade facilitation measures into account.

The EU is a very important trading partner for the CIS. On the other hand, the CIS as a region represents only a relatively small share of EU trade. EU's imports from the region are concentrated around a few sectors, mainly gas, oil and extractions. As a consequence of this asymmetric relationship the effects of an FTA between the EU and the CIS would have asymmetric effects on the two regions. The impact of an FTA would be more pronounced for the CIS and rather marginal for the EU.

Only a rather limited income effect would occur in the EU as a consequence of the FTAs while the income effect in the CIS would be higher in magnitude. The CIS would experience a negative income effect if the FTA would be limited only to trade in goods. These negative effects under the first two scenarios are mainly due to the important negative terms of trade effects taking place in Russia and Ukraine. This implies that the CIS would most likely to benefit from an FTA with the EU if it would incorporate deeper form of integration not being limited to liberalization of tariffs in goods.

The change in GDP in the two regions after the different FTAs also highlight that the CIS would only benefit from a full FTA and would experience a reduction in GDP in case of the first two, less coherent forms of FTAs. On the other hand, the effects on the EU would be always positive although small. Moreover, liberalization limited to only industrial goods results in smaller drop in GDP and smaller

decrease in real incomes in the CIS than when the FTA also incorporates liberalization of agricultural and processed food products due the higher negative terms of trade effects. The effect of an FTA on CIS's GDP would be positive only if the FTA would involve more than just removal of tariffs on industrial goods and agriculture.

## 6. Annex I Baseline scenario

The detailed results presented in the paper for the three different FTA scenarios are compared to the baseline scenario which takes into account the effects of a successful WTO accession, the EU enlargement and the phase-out of the ATC. This Annex presents a few tables with basic results of this baseline scenario.

The baseline scenario assumes that the WTO accession would imply a 2% reduction of technical barriers to trade. We do not assume that further tariff reductions would take place given that for most of the countries the currently negotiated binding tariffs are equal or higher to the current tariffs. For the EU enlargement we assumed elimination of tariffs between old and new member countries.

Table 6.1 below shows the real income effects of a WTO accession, EU enlargement and ATC phase-out. The effects are positive for most of the CIS countries and often higher than what an FTA with the EU would imply. Russia and Ukraine would experience the largest increases in real income amounting to 0.75% increase in the case of Russia and 1.23% for Ukraine. The income effects of the baseline scenario are positive for some of the countries while the effects of the different FTA scenarios are negative for the same countries. This difference is mainly explained by the different terms of trade effects which arise under the baseline scenario and the EU-FTA scenarios.

**Table 6.1. Real income effects (percentage changes)**

RUS	0.75
UKR	1.23
KAZ	0.64
KGZ	-0.11
ARM	-0.01
AZE	0.64
GEO	-0.06
XSU	2.18
EU_25	0.17

Terms of trade effects are shown in Table 6.2. While Russia, Kazakhstan, and Azerbaijan would experience a terms of trade improvement other countries would

have a small terms of trade deterioration. The terms of trade effects for the EU would be rather small, but positive.

**Table 6.2. Terms of trade effect**

RUS	0.50
UKR	-0.16
KAZ	0.41
KGZ	-0.32
ARM	-0.04
AZE	0.59
GEO	-0.12
XSU	0.21
EU_25	0.05

The resulting changes in GDP are presented in Table 6.3. These results are in line with the real income effects shown in Table 6.1. The changes in GDP are positive for all CIS. The highest increase would occur for the 'rest of CIS' (which consists of Belarus, Moldova, Tajikistan, Turkmenistan, and Uzbekistan). The increase in GDP would be the second most pronounced for Ukraine amounting to a 1.37% increase followed by Russia.

**Table 6.3. Change in GDP**

RUS	0.63
UKR	1.37
KAZ	0.48
KGZ	0.09
ARM	0.06
AZE	0.38
GEO	0.03
XSU	2.19
EU_25	0.15

# **7. Annex II Technical Annex: An Overview of the Computational Model**

## **7.1. Introduction**

This annex provides an overview of the basic structure of the global CGE model employed for our assessment of WTO accession and various FTAs linked to the European Union and CIS countries. The policy experiments themselves are explained with the country reports in the main body of the text.

The model is based on Francois, van Meijl, and van Tongeren (2005) and is implemented in GEMPACK -- a software package designed for solving large applied general equilibrium models. The reader can download and replicate our results, but will need access to GEMPACK to make modifications to the code or data. The model is solved as an explicit non-linear system of equations, through techniques described by Harrison and Pearson (1998). More information can be obtained at the following URL - <http://www.monash.edu.au/policy/gempack.htm>. The reader is referred to Hertel and Tsigas (1997) for a detailed discussion of the basic algebraic model structure represented by the GEMPACK code. While this appendix provides a broad overview of the model, detailed discussion of mathematical structure is limited to added features, beyond the standard GTAP structure covered in that document.

The model is a standard multi-region computable general equilibrium (CGE) model, with important features related to the structure of competition (as described by Francois and Roland-Holst 1997). Imperfect competition features are described in detail in Francois (1998). Social accounting data are based on the most recent Version 7 (pre-release) of the GTAP dataset ([www.gtap.org](http://www.gtap.org)), which is benchmarked to 2004.

## **7.2. General structure**

The general conceptual structure of a regional economy in the model is as follows. Within each region, firms produce output, employing land, labour, capital, and natural resources and combining these with intermediate inputs. Firm output is purchased by consumers, government, the investment sector, and by other firms. Firm output can also be sold for export. Land is only employed in the agricultural sectors, while capital and labour (both skilled and unskilled) are mobile between all production sectors. Capital is fully mobile within regions.

All demand sources combine imports with domestic goods to produce a composite good. In constant returns sectors, these are Armington composites. In increasing returns sectors, these are composites of firm-differentiated goods. Relevant substitution and trade elasticities are presented in Appendix Table 1.

## **7.3. Taxes and policy variables**

Taxes are included in the theory of the model at several levels. Production taxes are placed on intermediate or primary inputs, or on output. Some trade taxes are modeled at the border. Additional internal taxes can be placed on domestic or imported intermediate inputs, and may be applied at differential rates that discriminate against imports. Where relevant, taxes are also placed on exports, and on primary factor income. Finally, where relevant (as indicated by social accounting data) taxes are placed on final consumption, and can be applied differentially to consumption of domestic and imported goods.

Trade policy instruments are represented as import or export taxes/subsidies. This includes applied most-favored nation (mfn) tariffs, antidumping duties, countervailing duties, price undertakings, export quotas, and other trade restrictions. The major exception is service-sector trading costs, which are discussed in the next section. The full set of tariff vectors are based on WTO tariff schedules augmented with data on trade preferences. The set of services trade barrier estimates is described below.

## **7.4. Trade and transportation costs and services barriers**

International trade is modeled as a process that explicitly involves trading costs, which include both trade and transportation services. These trading costs reflect the transaction costs involved in international trade, as well as the physical activity of transportation itself. Those trading costs related to international movement of goods and related logistic services are met by composite services purchased from a global trade services sector, where the composite "international trade services" activity is produced as a Cobb-Douglas composite of regional exports of trade and transport service exports. Trade-cost margins are based on reconciled f.o.b. and c.i.f. trade data, as reported in version 6.2 of the GTAP dataset.

A second form of trade costs is known in the literature as frictional trading costs. These are implemented in the service sector. They represent real resource costs associated with producing a service for sale in an export market instead of the domestic market. Conceptually, we have implemented a linear transformation technology between domestic and export services. This technology is represented in Annex Figure 1. The straight line AB indicates, given the resources necessary to produce a unit of services for the domestic market, the feasible amount that can instead be produced for export using those same resources. If there are not frictional barriers to trade in services, this line has slope -1. This free-trade case is represented by the line AC. As we reduce trading costs, the linear transformation line converges on the free trade line, as indicated in the figure. In the model, this is modeled as a reduction in the cost of producing tradable goods and/or services, measured in units of the good/service itself.

We utilize service barrier estimates reported by Francois and Copenhagen Economics (2007). These yield an average trade restriction (TCE or trade cost equivalent) for producer services of 23.7 % in the FSU and 18.4 % in the EU27. The basic methodology for estimation of services barriers involves the estimation of an equation where import demand is a function of the size of the economy (GDP) and its income level (per-capita income). The Francois and CE approach is an improvement on the approach in Francois, van Meijl and van Tongeren (2005) as under the latter a pooling strategy is employed so that there are several points for estimation of each national restriction index (the  $a_j$  coefficient). Adjusted by the import substitution elasticity, estimated national coefficients provide an estimate of the trade-cost equivalent of existing barriers in services, as an average across service sectors. While the estimates are based on a cross-section of countries, Francois, Hoekman, and Woerz (2007) offer a panel-based set of estimates applying a similar method and interpreting country effect variables in the panel as measures of average openness. While their estimates do not cover the countries of



interest here, for countries with overlap with the two samples the results are consistent.

## 7.5. The composite household and final demand structure

Final demand is determined by an upper-tier Cobb-Douglas preference function, which allocates income in fixed shares to current consumption, investment, and government services. This yields a fixed savings rate. Government services are produced by a Leontief technology, with household/government transfers being endogenous. The lower-tier nest for current consumption is also specified as a Cobb-Douglas. The regional capital markets adjust so that changes in savings match changes in regional investment expenditures. (Note that the Cobb-Douglas demand function is a special case of the CDE demand function employed in the standard GTAP model code. It is implemented through GEMPACK parameter files.)

## 7.6. Market Structure

### 7.6.1. Demand for imports: Armington sectors

The basic structure of demand in constant returns sectors is Armington preferences. In Armington sectors, goods are differentiated by country of origin, and the similarity of goods from different regions is measured by the elasticity of substitution. Formally, within a particular region, we assume that demand goods from different regions are aggregated into a composite import according to the following CES function:

$$q_{j,r}^M = \left[ \sum_{i=1}^R \alpha_{j,i,r} M_{j,i,r}^{\rho_j} \right]^{1/\rho_j} \quad (1)$$

In equation (1),  $M_{j,i,r}$  is the quantity of  $M_j$  from region  $i$  consumed in region  $r$ . The elasticity of substitution between varieties from different regions is then equal

to  $\sigma_j^M$ , where  $\sigma_j^M=1/(1-\rho_j)$ . Composite imports are combined with the domestic good  $q^D$  in a second CES nest, yielding the Armington composite  $q$ .

$$q_{j,r} = \left[ \Omega_{j,M,r} \left( q_{j,r}^M \right)^{\beta_j} + \Omega_{j,D,r} \left( q_{j,r}^D \right)^{\beta_j} \right]^{1/\beta_j} \quad (2)$$

The elasticity of substitution between the domestic good and composite imports is then equal to  $\sigma_j^D$ , where  $\sigma_j^D=1/(1-\beta_j)$ . At the same time, from the first order conditions, the demand for import  $M_{j,i,r}$  can then be shown to equal

$$\begin{aligned} M_{j,i,r} &= \left[ \frac{\alpha_{j,i,r}}{P_{j,i,r}} \right]^{\sigma_i^m} \left[ \sum_{i=1}^R \alpha_{j,i,r}^{\sigma_j^M} P_{j,i,r}^{1-\sigma_j^M} \right]^{-1} E_{j,r}^M \\ &= \left[ \frac{\alpha_{j,i,r}}{P_{j,i,r}} \right]^{\sigma_j^M} \left( P_{j,r}^M \right)^{\sigma_j^M - 1} E_{j,r}^M \end{aligned} \quad (3)$$

where  $E_{j,r}^M$  represents expenditures on imports in region  $r$  on the sector  $j$  Armington composite. In practice, the two nests can be collapsed, so that imports compete directly with each other and with the corresponding domestic product. This implies that the substitution elasticities in equations (1) and (2) are equal. (These elasticities are reported in Annex Table 1).

### 7.6.2. Imperfect competition

As indicated in Annex Table 1, we model manufacturing sectors and service sectors as being imperfectly competitive. The approach we follow has been used in the Michigan and the WTO assessment of the Uruguay Round. Recent model testing work indicates that this approach works “best” vis-à-vis Armington models, when tracked against actual trade patterns. (See Fox 1999, who uses the U.S.-Canada FTA as a natural experiment for model testing).

Formally, within a region  $r$ , we assume that demand for differentiated intermediate products belonging to sector  $j$  can be derived from the following CES function, which is now indexed over firms or varieties instead of over regions. We have

$$q_{j,r} = \left[ \sum_{i=1}^n \gamma_{j,i,r} X_{j,i,r}^{\Gamma_j} \right]^{1/\Gamma_j} \quad (4)$$

where  $\gamma_{j,i,r}$  is the demand share preference parameter,  $X_{j,i,r}$  is demand for variety  $i$  of product  $j$  in region  $r$ , and  $\sigma_j = 1/(1-\Gamma_j)$  is the elasticity of substitution between any two varieties of the good. Note that we can interpret  $q$  as the output of a constant returns assembly process, where the resulting composite product enters consumption and/or production. Equation (4) could therefore be interpreted as representing an assembly function embedded in the production technology of firms that use intermediates in production of final goods, and alternatively as representing a CES aggregator implicit in consumer utility functions. In the literature, and in our model, both cases are specified with the same functional form. While we have technically dropped the Armington assumption by allowing firms to differentiate products, the vector of  $\gamma$  parameters still provides a partial geographic anchor for production. (Francois and Roland-Holst 1997, Francois 1998).

Globally, firms in different regions compete directly. These firms are assumed to exhibit monopolistically competitive behavior. This means that individual firms produce unique varieties of good or service  $j$ , and hence are monopolists within their chosen market niche. Given the demand for variety, reflected in equation (4), the demand for each variety is less than perfectly elastic. However, while firms are thus able to price as monopolists, free entry (at least in the long-run) drives their economic profits to zero, so that pricing is at average cost. The joint assumptions of average cost pricing and monopoly pricing, under Bertrand behavior, imply the following conditions for each firm  $f_i$  in region  $i$ :

$$\zeta_{j,f_i} = \sum_{r=1}^R \frac{X_{j,f_i,r}}{X_{j,f_i}} \left( \sum_{k=1}^n \left( \frac{\alpha_{j,k,r}}{\alpha_{j,f_i,r}} \right)^{\sigma_j} \left( \frac{P_{j,k,r}}{P_{j,f,r}} \right)^{1-\sigma_j} \right)^{-1} \quad (5)$$

$$P_{f,i} = AC_{f,i} \quad (6)$$

The elasticity of demand for each firm  $f_i$  will be defined by the following conditions.

$$\varepsilon_{j,f_i} = \sigma_j + (1 - \sigma_j) \zeta_{j,f_i} \quad (7)$$

$$\frac{P_{f,i} MC_{f,i}}{P_{f,i}} = \frac{1}{\varepsilon_{f,i}} \quad (8)$$

In a fully symmetric equilibrium, we would have  $\zeta_{j,i} = n^{-1}$ . However, the calibrated model includes CES weights  $\gamma$ , in each regional CES aggregation function, that will vary for firms from different regions. Under these conditions,  $\zeta$  is a quantity weighted measure of market share. To close the system for regional produc-

tion, we index total resource costs for sector  $j$  in region  $i$  by the resource index  $Z$ . Full employment of resources hired by firms in the sector  $j$  in region  $i$  then implies the following condition.

$$Z_{j,i} = \sum_{f=1}^{n_i} TC_{j,i,f} \tag{9}$$

Cost functions for individual firms are defined as follows:

$$C(x_{j,i}) = (a_{j,i} + b_{j,i} x_{j,i}) P_{Z_{j,i}} \tag{10}$$

This specification of monopolistic competition is implemented under the “large group” assumption, which means that firms treat the variable  $n$  as “large”, so that the perceived elasticity of demand equals the elasticity of substitution. The relevant set of equations then collapses to the following:

$$q_{j,r} = \left[ \sum_{i=1}^R \bar{\gamma}_{j,i,r} \bar{x}_{j,i,r}^{\Gamma_j} \right]^{\frac{1}{\Gamma_j}}$$

$$\bar{\gamma}_{j,i,r} = \alpha_{j,i,r} n_{j,i} 0^{1-\Gamma_j} \tag{11}$$

$$\bar{x}_{j,i,r} = \left( \frac{n_{j,i}}{n_{j,i} 0} \right)^{(1-\Gamma_j)/\Gamma_j} X_{j,i,r}$$

$$\bar{x}_{j,i} = \left( \frac{Z_{j,i} 1}{Z_{j,i} 0} \right)^{(1-\rho_j)/\rho_j} X_{j,i} \tag{12}$$

In equation (12),  $n_0$  denotes the number of firms in the benchmark. Through calibration, the initial CES weights in equation (12) include the valuation of variety. As a result, the reduced form exhibits external scale effects, determined by changes in variety based on firm entry and exit, and determined by the substitution and scale elasticities.

### **7.6.3. Markups**

Scale elasticities, based on our average markup estimates, are reported in the Annex Table 1. The starting point for these is recent estimated price-cost markups from the OECD (Martins, Scarpetta, and Pilat 1996). These provide estimates of markups, based on methods pioneered by Hall (1988) and Roeger (1995). The Martins et al paper provides an overview of the recent empirical literature. We have supplemented these with price-cost markups estimated, given our theoretical structure, from the set of GTAP Armington elasticities, and also from estimates reported in Antweiler and Trefler (2002).

### **7.7. Investment**

We model changes in the capital stock as being linked to changes in levels of savings and investment. This follows Francois and McDonald (1996). Under this approach, there is a basic proportionality when comparing long-run equilibriums. In particular, given a policy shock, the long-run change in capital stock should be proportional to the long-run change in investment levels:

$$K_t = K_0 (I_t / I_0) \tag{13}$$

Where investment is determined by changes in savings rates and the price of capital goods, and where savings rates are taken as fixed. More detail is provided in Francois and McDonald (1996).

### **7.8. Aggregation scheme**

The basic aggregation scheme for the model is presented in Annex Tables 1 and 4.

**Annex II Table 1. Elasticities**

	<b>Elasticity of substitution in valued added</b>	<b>Trade substitution elasticity</b>	<b>Market structure</b>	<b>Variety-scale elasticity</b>
Agricultural products, food	0.33	5.5	CRTS	0.000
Processed Food	1.12	4.4	MC	0.294
Textiles and Clothing	1.26	7.5	CRTS	0.000
Coals, and other minerals	0.20	2.6	CRTS	0.000
Oil	0.20	10.4	CRTS	0.000
Gas	0.20	34.4	CRTS	0.000
Light Manufacturing	1.26	6.6	MC	0.179
Heavy Manufacturing	1.26	7.5	MC	0.154
Utilities and Construction	1.37	4.5	CRTS	0.000
Transport and Communication	1.63	3.8	CRTS	0.000
PubAdmin/Defence/Health/Education	1.26	3.8	CRTS	0.000
Other Services	1.26	3.8	MC	0.357

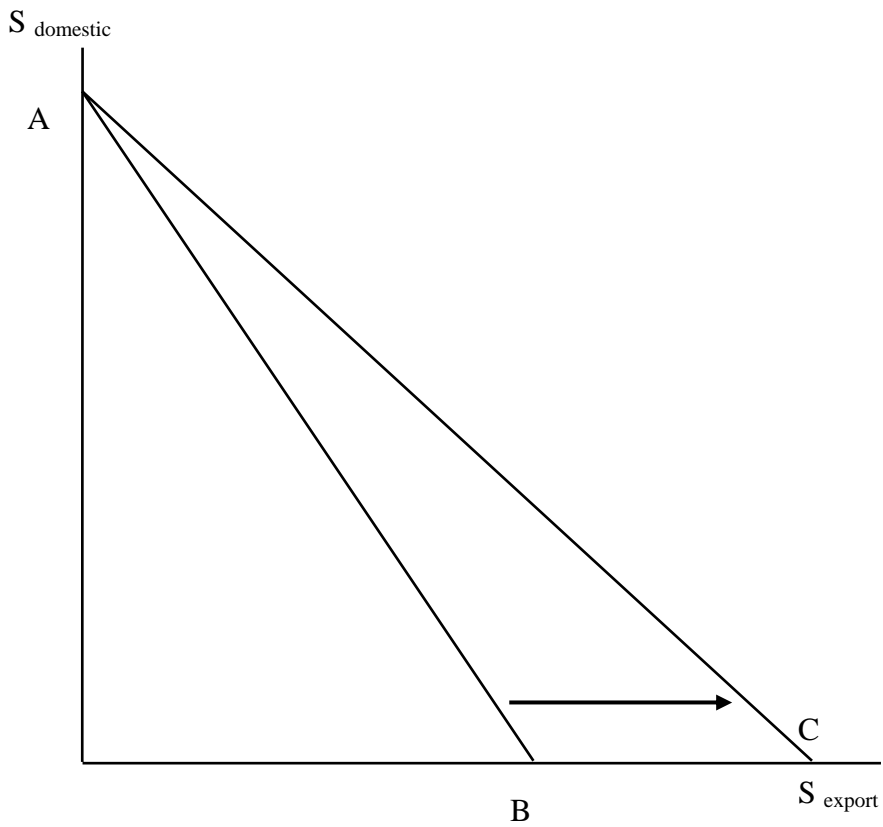
Note. CRTS – constant returns to scale, MC – monopolistic competition.

Source: Francois and Copenhagen Economics (2007).

**Annex II Table 2. Model Aggregation Scheme**

<b>Model Regions</b>	<b>Model Sectors</b>
Russia	Agricultural products, food
Ukraine	Processed Food
Kazakhstan	Textiles and Clothing
Kyrgyzstan	coals, and other minerals
Armenia	Oil
Azerbaijan	Gas
Georgia	Light Manufacturing
Rest of Former Soviet Union	Heavy Manufacturing
East, Southeast and South Asia	Utilities and Construction
Rest of Europe	Transport and Communication
North America	PubAdmin/Defence/Health/Education
Latin America	Other Services
European Union	
Middle East and North Africa	
Sub-Saharan Africa	
Rest of World	

**Annex II Figure 1. Trading Costs in the Service Sector**



## **8. Country Study: Armenia**

### **8.1. Introduction**

After the disintegration of the Soviet Union the EU has become the main trade partner of Armenia. For the EU, Armenia is a very marginal trade partner and trade with Armenia represents a very limited share of total EU trade. The EU exports mainly machinery and transport equipment to Armenia. On the other hand, Armenia mainly exports base metals and products made of them, which represent more than 60% of total exports to the EU, and diamonds and precious stones, representing around 25% of total exports.

The framework for the EU bilateral trade relations with Armenia is governed by the Partnership and Cooperation Agreement (PCA), which entered into force in 1999. The agreement implies Most Favoured Nation (MFN) treatment with respect to tariffs and quantitative restrictions are prohibited in bilateral trade. The PCA also envisages progressive regulatory approximation in the most important trade related areas (industrial standards, sanitary and phytosanitary issues, intellectual property rights, customs, public procurement etc). Furthermore, Armenia is a beneficiary of the EU Generalised System of Preferences.

The EU adopted a European Neighbourhood Policy (ENP) Action Plan with Armenia in 2006. The Action Plan various issues and has a specific point on future enhancement of bilateral trade relations between the EU and Armenia which includes a possible establishment of a Free Trade Agreement (FTA).

The rest of the study is organized as follows: Section 8.2 offers a general background to the production and trade of Armenia. Section 8.3 discusses the results. Concluding comments can be found in Section 8.4.

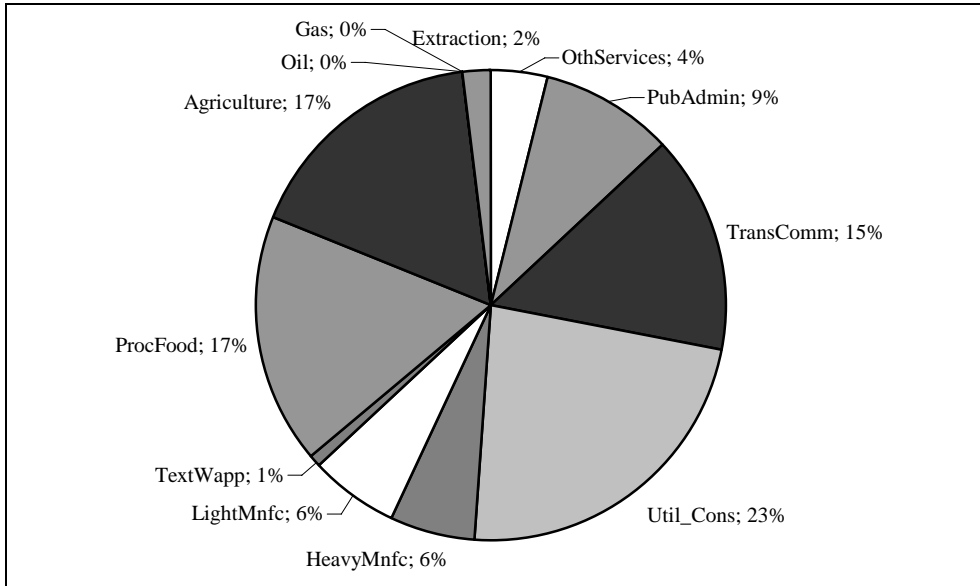
### **8.2. Trade and Production structure of Armenia**

The importance of different sectors in Armenia's output is depicted in Figure 8.2.1. Services represent about 50% of output in Armenia which is lower than in



some other CIS countries. Among manufacturing sectors heavy and light manufacturing sectors take up the most important part of total output, each representing about 6% of total output. Armenia has a rather important agricultural and processed food sector which represents together more than 34% of total output. These sectors are much more important in Armenia's economy than in many other CIS countries.

**Figure 8.2.1. Share of sectors in output in 2004**

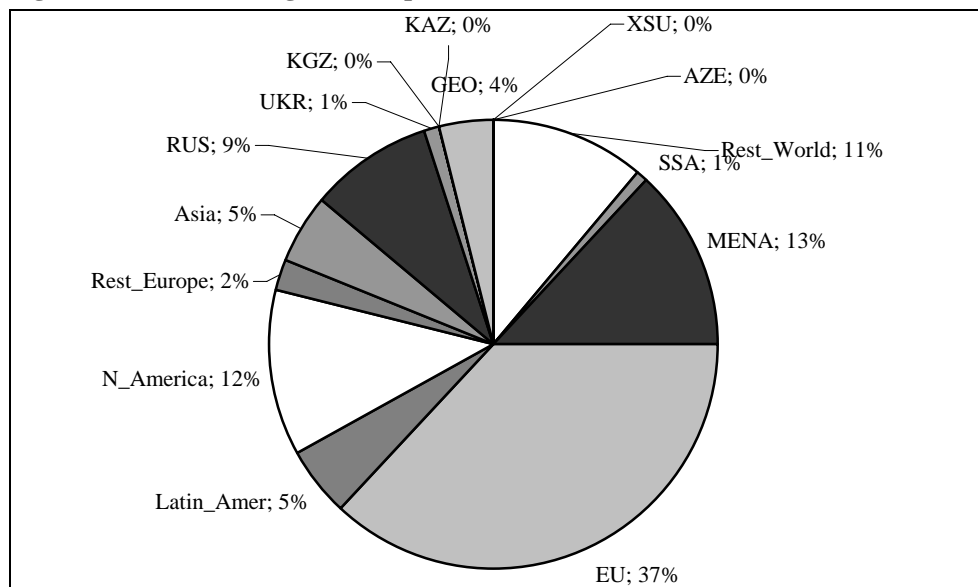


Source: own calculations, data come from GTAP database version 7.

Figure 8.2.2 depicts the importance of different regions and countries in Armenia's exports. The EU is the most important export destination for Armenia. About 37% of all Armenian exports go to the EU. The second biggest export destination is within the CIS region. About 15% of Armenia's exports go to other countries in the CIS from which 9% go to Russia. The MENA countries also absorb an important share of total exports, about 13% of Armenia's export go to the region.

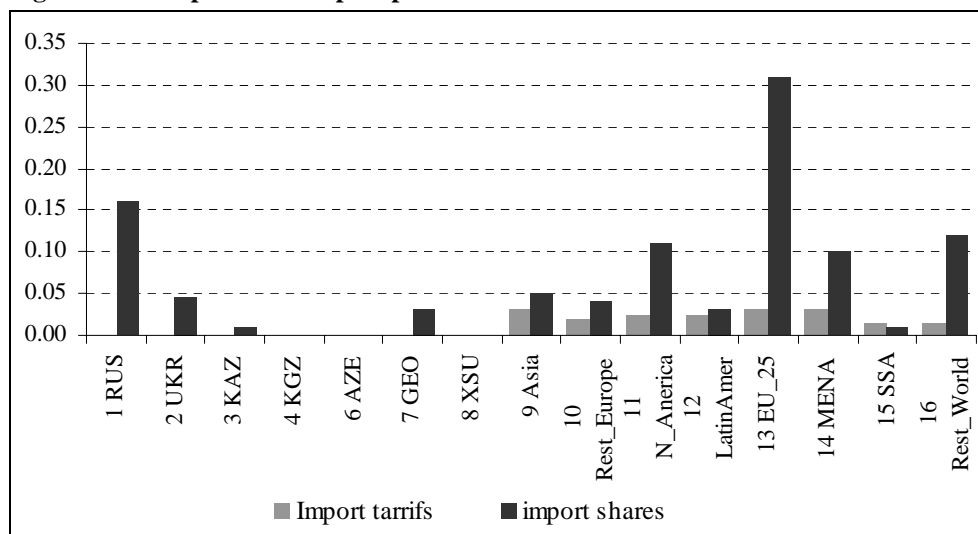
Figure 8.2.3 depicts Armenia's imports coming from different destinations and the corresponding import tariffs. For Armenia, the EU is the most important import partner with imports coming from the EU representing about one third of total Armenia's imports. There are no import tariffs for other countries in the CIS region, nevertheless the share of imports coming from these countries is rather small with the exception of Russia from where a bit more than 15% of total imports originate.

Figure 8.2.2. Share of regions in exports in 2004



Source: own calculations, data come from GTAP database version 7.

Figure 8.2.3. Imports and import protection in Armenia in 2004

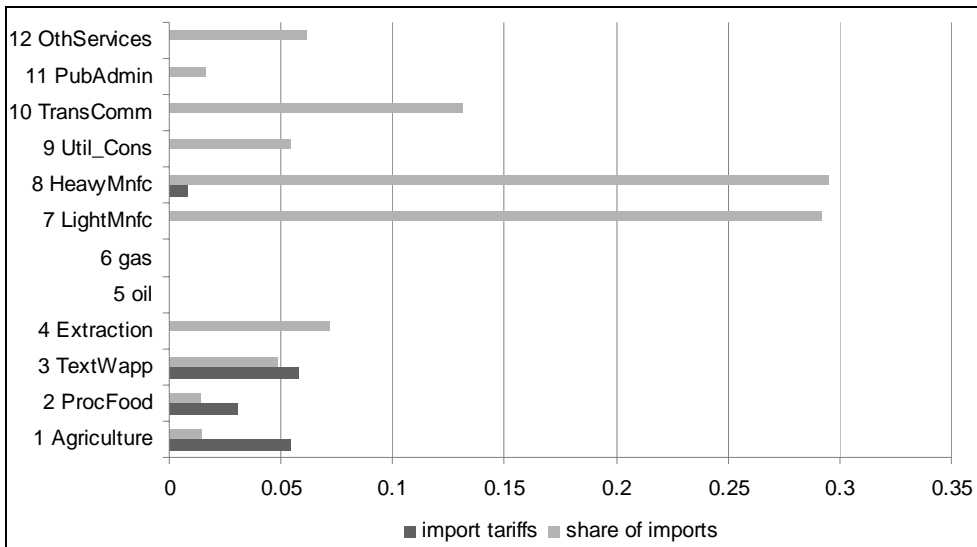


Source: own calculations, data come from GTAP database version 7.

Figure 8.2.4 shows EU import tariffs and import in different sectors originating from Armenia. The highest import tariffs are in the processed food sector, agricul-

ture and in textiles and clothing. The share of imports in processed food and agriculture sector is rather small; imports in these sectors is around 1-2% while in textiles and apparel it is a bit higher amounting to 5% of total imports. The sectors with the highest share of imports are heavy and light manufacturing which both represents about 30% of total imports.

**Figure 8.2.4. EU imports and import tariffs in 2004**



Source: own calculations, data come from GTAP database version 7.

### 8.3. Results

#### 8.3.1. Real Income Effects

Trade liberalization would have a positive income effect for Armenia under all three FTA scenarios which are shown in Table 8.3.1. The first two scenarios would result in a rather small increase in real incomes, amounting to 0.12% increase under the first and 0.07% increase under the second scenario which is even smaller than the effect on real income in the EU. The third, full FTA scenario would have the highest positive real income effect with a 0.49% real income increase which is a bit smaller than CIS average real income effects.

**Table 8.3.1. Real Income Effects (percentage change from baseline)**

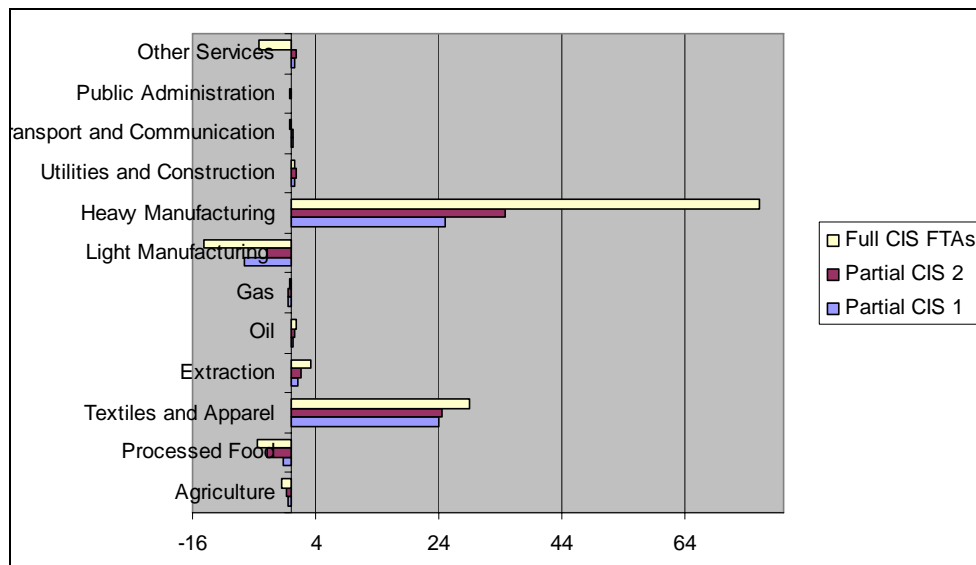
Scenario	Partial 1 trade agreement	Partial 2 trade agreement	Full FTA
EU	0.14	0.13	0.21
CIS	-0.53	-0.83	0.62
Armenia	0.12	0.07	0.49

Source: Model simulations.

### 8.3.2. Changes in sectoral output in Armenia

Our analyses of the expected changes in sectoral output as a result of different forms of trade liberalisation show that important changes would occur in the sectoral output of Armenia. Figure 8.3.1 depicts changes in the output of different sectors in Armenia after the three different FTA would take place.

**Figure 8.3.1. Changes in sectoral output of Armenia**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The most pronounced decrease would take place in the light manufacturing sector: around 4-8% in the case of the first two scenarios and somewhat higher, around 15% under the full FTA scenario. Apart from light manufacturing sectors processed food products would also experience a drop in output which would be

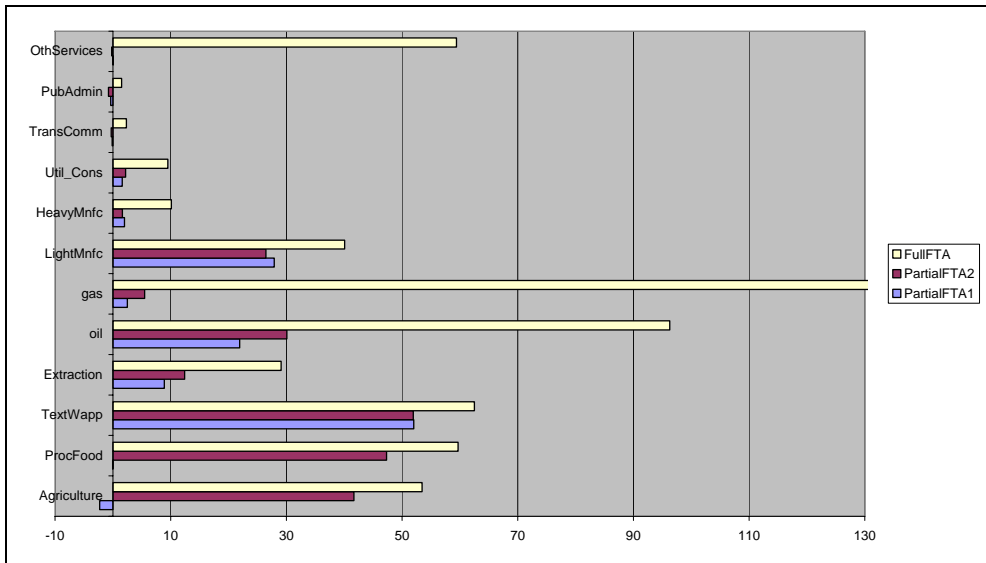
the highest under the third FTA variant with a magnitude of 6% and somewhat lower under the two other FTA scenarios.

Most other sectors would have only a very limited change in their outputs under the different scenarios. Sectors belonging to heavy manufacturing sectors would experience an important increase in the output (25-35%) under the first two scenarios and a 76% increase under the third type of FTA scenario which would incorporate liberalization in services. Apart from heavy manufacturing an important increase would occur in textiles and apparel amounting to 24-29% increase depending on the scenario.

### 8.3.3. Effects on bilateral trade flows

In this section we provide detailed results on trade impacts in the three scenarios, and we present the changes in trade flows by sector.

Figure 8.3.2. Changes in EU exports to Armenia by sector



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The Figure 8.3.2 depicts changes in EU exports towards Armenia after the three different FTA scenarios. The services sectors experience a small reduction in the first two scenarios. Under the third scenario, trade in services sectors belonging to ‘other services’ is liberalised. As a consequence of this there would be an

important, about 60% increase in EU exports in other services sectors towards Armenia. An important increase would occur in exports of textiles and apparel under all scenarios, the biggest increase occurring under the third scenario. The exports in these sectors would increase by 62% under the full FTA. Light manufacturing exports would also increase by about 27-40% depending on the scenarios. When trade liberalisation would occur also in agriculture and processed food sectors, these sectors would also experience an important increase in their exports towards Armenia. There would be an increase in oil and gas exports, which according to the graph is important in terms of percentage change compared to the baseline scenario. The table below shows the percentage changes compared to the baseline together with the share of exports in each sector. The share of gas and oil sector's exports is very close to zero, thus the increase shown in the graph in the exports of gas Armenia in terms of level is minimal.

**Table 8.3.2. Percentage changes in EU sectoral exports to Armenia**

	<b>Partial FTA1</b>	<b>Partial FTA 2</b>	<b>Full FTA</b>	<b>Share in total exports</b>
Agriculture	-2.26	41.67	53.46	2.21%
Processed Food	-0.03	47.31	59.70	9.17%
Textiles and Apparel	52.03	51.94	62.51	4.64%
Extraction	8.92	12.42	29.08	15.82%
Oil	21.93	30.09	96.27	0.00%
Gas	2.51	5.51	280.15	0.00%
Light Manufacturing	27.90	26.47	40.08	11.76%
Heavy Manufacturing	2.02	1.65	10.12	37.40%
Utilities and Construction	1.63	2.19	9.50	1.76%
Transport and Communication	-0.11	-0.28	2.34	9.91%
Public Administration	-0.37	-0.74	1.51	1.10%
Other Services	0.08	-0.20	59.42	6.24%

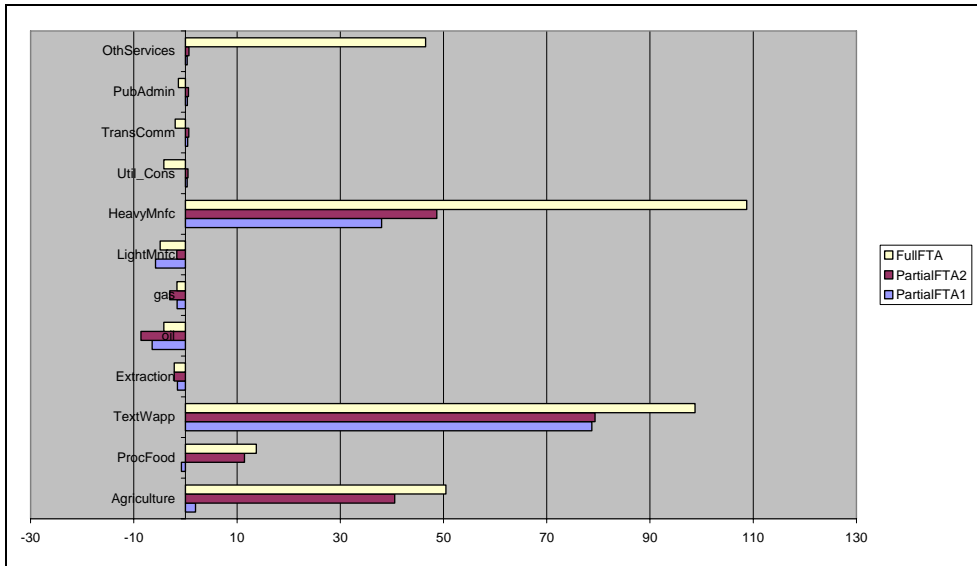
Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Figure 8.3.3 shows percentage changes in exports of Armenia by each sector towards the EU. Similarly to the case of EU exports in services, an important increase would occur in other services exports if trade would be liberalised between the EU and the CIS in these sectors.

While there would be a small reduction in exports of oil, gas, extractions and light manufacturing exports, important increases would take place in exports of some of the sectors. The most pronounced increase would occur in the textiles and apparel sectors. Under the first and second scenarios, the increase would be around 79% and would be around 99% in case of full liberalisation. Exports in heavy

manufacturing would increase by 38-48% under the two first scenarios and by 109% in case of full liberalisation. Increase in exports of processed food and agricultural products would take place mainly under the second and third FTA scenarios which would incorporate liberalisation in agricultural and processed goods apart from elimination of tariffs in industrial goods.

**Figure 8.3.3. Changes in Armenian exports to the EU by sector**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

**Table 8.3.3. Percentage changes in Armenia’s sectoral exports to the EU**

	Partial FTA 1	Partial FTA 2	Full FTA	Share in total exports
Agriculture	1.95	40.55	50.49	1.45%
Processed Food	-0.78	11.47	13.75	1.38%
Textiles and Apparel	78.74	79.36	98.72	4.49%
Extraction	-1.55	-2.15	-2.15	7.20%
Oil	-6.44	-8.61	-4.16	0.00%
Gas	-1.59	-3.02	-1.64	0.00%
Light Manufacturing	-5.79	-1.66	-4.89	31.03%
Heavy Manufacturing	38.02	48.72	108.73	27.36%
Utilities and Construction	0.35	0.51	-4.17	5.60%
Transport and Communication	0.45	0.64	-1.96	13.52%
Public Administration	0.36	0.60	-1.38	1.64%
Other Services	0.33	0.71	46.54	6.34%

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Table 8.3.3 shows the percentage changes in sectoral exports together with the share of each sector in total exports towards the EU in the baseline. Although the most important increase would occur in the textiles and apparel sector with exports to the EU increasing by 78-98% depending on the scenario, this sector only represents a small share of exports in total exports. Less than 5% of exports occur in these sectors. Important increase would occur also in the agricultural sector under the second and third scenarios. Again, this sector represents only a very small share of total exports therefore the change after the different FTAs in level would be only very small.

### **8.3.4. Other Macroeconomic Results**

In this section other macroeconomic results, such as changes in wages and GDP are discussed. These results are summarized in Table 8.3.4 and Table 8.3.5 below. Armenia would have an increase of 0.51% in its GDP under the full FTA scenario which is shown in Table 8.3.4. This increase is less than half of the average increase which would take place in the CIS.

Armenia would experience an increase in wages for both the skilled and unskilled workers. This increase would be similar to those reported for the average of CIS for the wages of skilled workers where 1.45% increase would occur. The increase in Armenian wages for unskilled would be somewhat lower, around 1.01%.

**Table 8.3.4. Macroeconomic results from Full FTA (in %)**

	<b>EU</b>	<b>CIS</b>	<b>Armenia</b>
Change in GDP	0.18	1.19	0.51
Unskilled worker wage	0.26	1.56	1.01
Skilled worker wage	0.24	1.47	1.45

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The results with regards to the effect on other macroeconomic variables of the more realistic scenarios of trade agreements are summarized in Table 8.3.5 below. These results are different in magnitude and represent smaller increases than the full FTA scenario. The first scenario would result in a small, 0.19% increase in the GDP while the second scenario would have a slightly higher positive effect.

Both skilled and unskilled workers in Armenia would experience an increase in their wages similarly to the full FTA scenario although the effects would be lower. The changes in wages in Armenia would be higher than those experienced by



workers on average in the CIS or in the EU. The increase in wages in Armenia would be higher for skilled workers and lower for unskilled workers under all three FTA scenarios.

**Table 8.3.5. Macroeconomic results from Partial 1 & 2 trade agreement**

	Partial 1 trade agreement			Partial 2 trade agreement		
	EU	CIS	Armenia	EU	CIS	Armenia
Change in GDP	0.12	-0.13	0.19	0.10	-0.35	0.30
Unskilled worker wage	0.18	0.22	0.42	0.18	0.16	0.47
Skilled worker wage	0.16	0.32	0.59	0.15	0.36	0.72

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

### 8.3.5. Terms of Trade Effects

The Table 8.3.6 shows terms of trade effects in the case of full free trade agreement with liberalization not being limited to only agriculture and manufacturing products but also services trade and technical barriers. While the EU would have small terms of trade improvement amounting to about 0.11%, the CIS on average would experience 0.83% deterioration and the terms of trade deterioration would amount to 1% in the case of Armenia.

**Table 8.3.6. Terms of trade results from Full FTA (in %)**

	EU	CIS	Armenia
Terms of trade effects	0.11	-0.83	-1.00

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

**Table 8.3.7. Terms of trade results from Partial 1 & 2 trade agreement**

	Partial 1 trade agreement			Partial 2 trade agreement		
	EU	CIS	Armenia	EU	CIS	Armenia
Terms of trade effects	0.09	-0.63	-0.31	0.10	-0.76	-0.73

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The terms of trade effects for the two other forms of trade liberalisation are presented in the table below. Armenia again, similarly to the full FTA case would experience a terms of trade deterioration however it would be slightly lower under the first two FTAs than under full FTA liberalization. The decrease in terms of trade would be slightly smaller in magnitude under the first and second scenarios

to the CIS average terms of trade changes. On the other hand the terms of trade gains for the EU would be significantly much smaller than for Armenia and always positive.

## **8.4. Conclusions**

In this study we explore the economic effects of potential measures to liberalize trade between the European Union and Armenia. In so doing, we have a Computable General Equilibrium Model, CGE Model, based on the most recent version of the GTAP data base, i.e. GTAP 7, which is benchmarked to data from 2004. Our CGE model follows recent research in trade theory in taking differences in underlying industry specific market structures and elasticities into account. Furthermore, the model incorporates estimated non-tariff trade barriers to trade in services, stemming from industry-specific gravity equation, which enhances the analysis of the service sector. The results are compared to a baseline which incorporates recent developments in the trade policy environment, i.e. the phase out of ATC, enlargement of the EU and CIS accessions to the WTO. The analysis takes agricultural liberalization, liberalization in industrial tariffs, and liberalization in services trade as well as trade facilitation measures into account.

The EU is a very important trading partner for Armenia. On the other hand, Armenia plays only a marginal role in EU's trade relations. Furthermore, CIS as a region represents only a relatively small share of EU trade. As a consequence of this asymmetric relationship the effects of an FTA between the EU and the CIS would have asymmetric effects on the EU and Armenia. The impact of an FTA would be more pronounced for Armenia and rather marginal for the EU.

Only a rather limited income effect would occur in the EU as a consequence of the FTAs while the income effect in Armenia would be somewhat higher in magnitude but only under the third FTA scenario.

The change in GDP in the two regions reflects similar developments. The change in Armenia's GDP would be positive under all the three FTAs, the effect being rather small under the first two scenarios.

## **9. Country Study: Azerbaijan**

### **9.1. Introduction**

After the disintegration of the Soviet Union the EU has become the main trade partner of Azerbaijan. On the other hand, for the EU, Azerbaijan is a very marginal trade partner and trade with Azerbaijan represents a very limited share of total EU trade. The EU exports mainly machinery and transport equipment to the Azerbaijan. Azerbaijan mainly exports fuels representing around 93% of its total exports to the EU (in 2004).

The framework for the EU bilateral trade relations with Azerbaijan is governed by the Partnership and Cooperation Agreement (PCA), which entered into force in 1999. The agreement implies Most Favoured Nation (MFN) treatment with respect to tariffs and quantitative restrictions are prohibited in bilateral trade. The PCA also foresees gradual regulatory approximation in the most important trade related areas (industrial standards, sanitary and phytosanitary issues, intellectual property rights, customs, public procurement etc). Furthermore, Azerbaijan is a beneficiary of the EU Generalised System of Preferences.

The EU adopted a European Neighborhood Policy (ENP) Action Plan with Azerbaijan in 2006. The Action Plan covers various issues and has a specific point on future enhancement of bilateral trade relations between the EU and Azerbaijan which includes a possible establishment of a Free Trade Agreement (FTA).

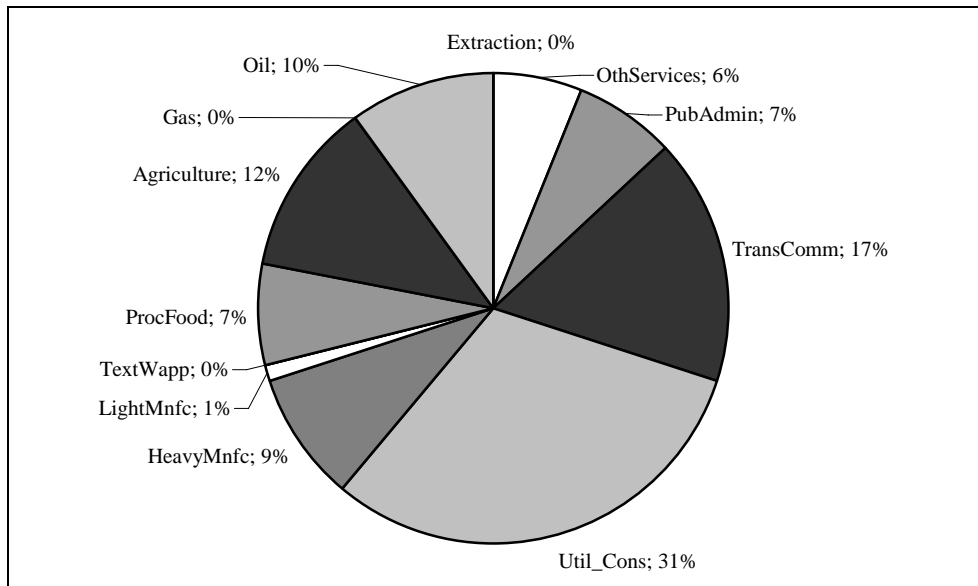
The rest of the study is organized as follows: Section 9.2 offers a general background to the production and trade of Azerbaijan. Section 9.3 discusses the results. Concluding comments can be found in Section 9.4.

### **9.2. Trade and Production structure of Azerbaijan**

The importance of different sectors in Azerbaijan's output is depicted in Figure 9.2.1. Services represent about 61% of output in Azerbaijan which is around the average of CIS countries. Among manufacturing sectors, heavy manufacturing

sectors take up the most important part of total output representing about 9% of total output. The share of oil in total output is the highest among industrial goods representing about 10% of total output in 2004. Azerbaijan has a rather important agricultural and processed food sector, output in these sectors together take up more than 19% of total output. These sectors are somewhat more important in the economy than in many other CIS countries.

**Figure 9.2.1. Share of sectors in output in 2004**

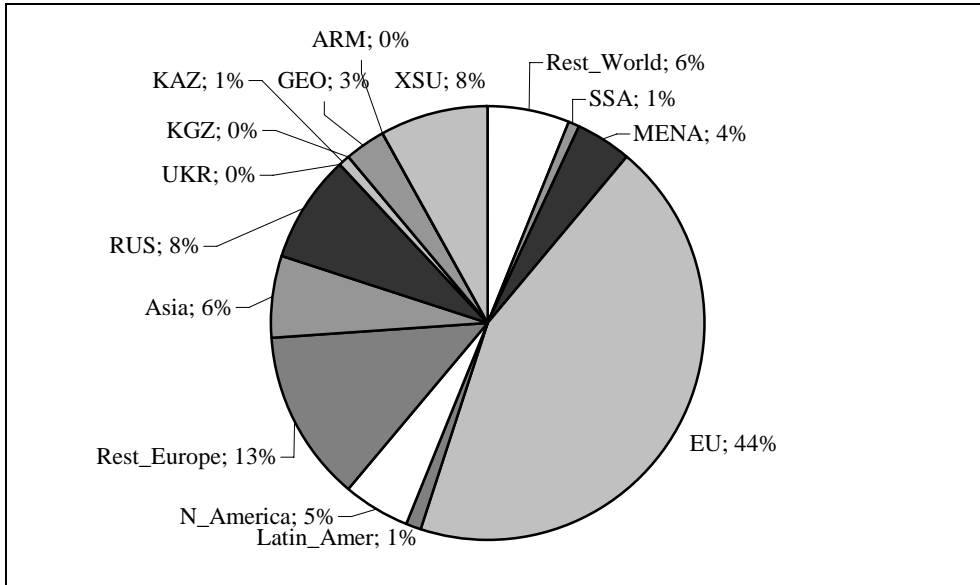


Source: own calculations, data come from GTAP database version 7.

Figure 9.2.2 depicts the importance of different regions and countries in Azerbaijan's exports. The EU is the most important export destination for Azerbaijan. About 44% of all Azerbaijan's exports go to the EU-25. The second biggest export destination is within the CIS region. About 20% of Azerbaijan exports go to other CIS countries from which 8% go to Russia. Moreover, 13% of total exports go to other countries in Europe outside the EU and the CIS.

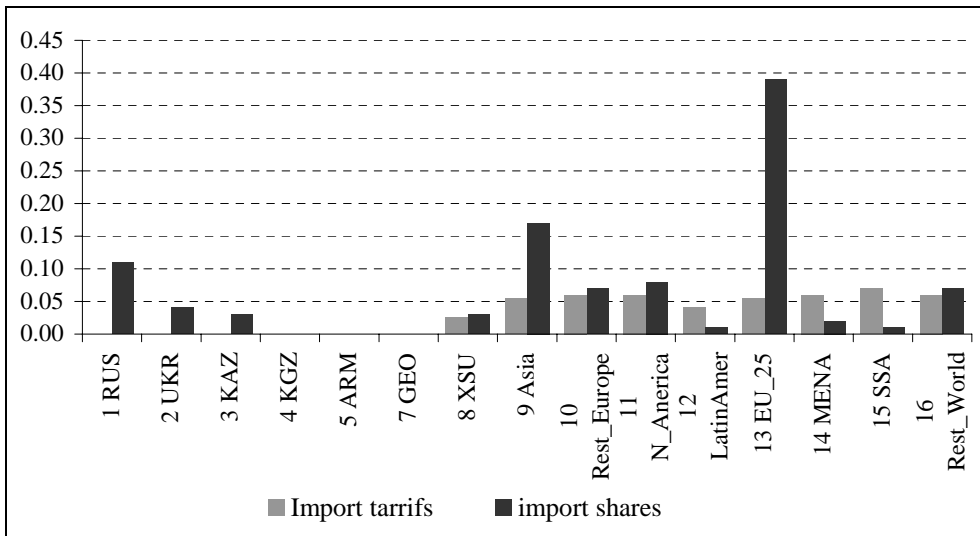
Figure 9.2.3 depicts Azerbaijan's imports coming from different destinations and the corresponding import tariffs. For Azerbaijan, the EU (EU-25) is the most important import partner with imports coming from the EU representing about 40% of total Azerbaijan's imports. There are no import tariffs for other countries in the CIS region, nevertheless the share of imports coming from these countries is rather small with the exception of Russia from where a bit more than 10% of total imports originate. About 16% of Azerbaijan's import is coming from Asian countries outside the CIS region.

**Figure 9.2.2. Share of regions in exports in 2004**



Source: own calculations, data come from GTAP database version 7.

**Figure 9.2.3. Imports and import protection in 2004**

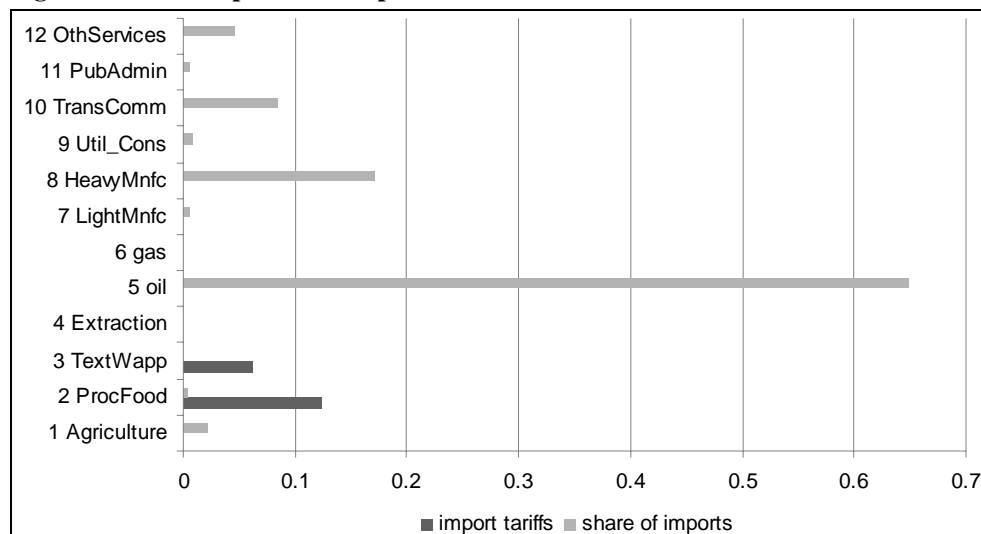


Source: own calculations, data come from GTAP database version 7.

Figure 9.2.4 shows EU import tariffs and import in different sectors originating from Azerbaijan. The import tariffs are only important in the processed food sec-

tor and in textiles and clothing. The share of imports in these sectors is very limited. The sectors with the highest share of imports are heavy manufacturing and oil. The share of imports in oil is 65% of total imports in 2004 while in heavy manufacturing it is around 18%.

**Figure 9.2.4. EU imports and import tariffs**



Source: own calculations, data come from GTAP database version 7.

## 9.3. Results

### 9.3.1. Real Income Effects

Trade liberalization would have a positive income effect for Azerbaijan only under the full FTA scenario which is shown in Table 9.3.1. The first two scenarios would result in a small decrease in real income, amounting to 0.41% decrease under the first and to a 0.45% decrease under the second scenario which is smaller than the effect on real income in the CIS on average. The third, full FTA scenario would have a positive real income effect with a 0.58% real income increase which is a bit smaller than CIS real income effects.

**Table 9.3.1. Real Income Effects (percentage change from baseline)**

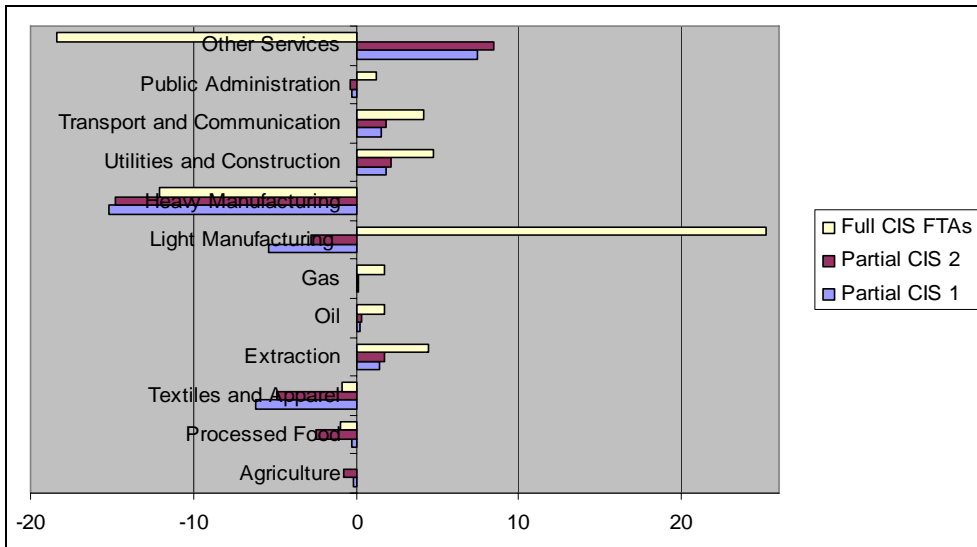
Scenario	Partial 1 trade agreement	Partial 2 trade agreement	Full FTA
EU	0.14	0.13	0.21
CIS	-0.53	-0.83	0.62
Azerbaijan	-0.41	-0.45	0.58

Source: Model simulations.

### 9.3.2. Changes in sectoral output in Azerbaijan

Our analyses of the expected changes in sectoral output as a result of different forms of trade liberalisation show that important changes would occur in the sectoral output of Azerbaijan. Figure 9.3.1 depicts changes in the output of different sectors in Azerbaijan after the three different FTA would take place.

**Figure 9.3.1. Changes in sectoral output**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

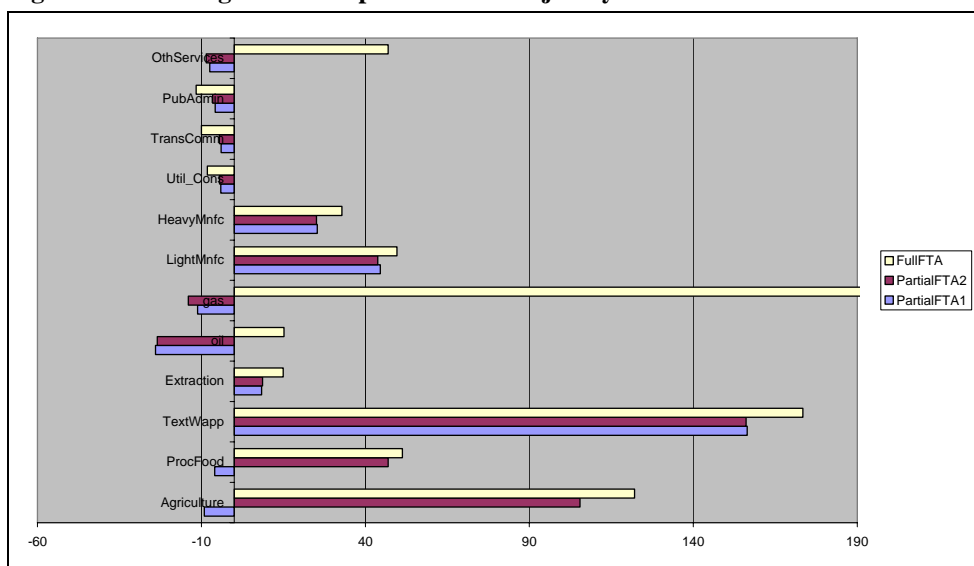
The most pronounced decrease would take place in the heavy manufacturing sectors and in other services under the third full FTA scenario. The heavy manufacturing sector would experience a decrease in output which would be around 12-15% depending on the scenarios. The change in other services production would be positive in case of the first two FTA scenarios however, the third scenario

would result in an 18% decrease in output in these sectors. Apart from heavy manufacturing and other services, textiles and apparel and light manufacturing would also have a reduction in output. Under the third full FTA scenario however there would be an important increase in the output of light manufacturing sectors amounting to 25%.

### 9.3.3. Effects on bilateral trade flows

In this section we provide detailed results on trade impacts in the three scenarios, and we present the changes in trade flows by sector.

**Figure 9.3.2. Changes in EU exports to Azerbaijan by sector**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The Figure 9.3.2 depicts changes in EU exports towards Azerbaijan after the three different FTA scenarios. The services sectors experience a small reduction in the first two scenarios. Under the third scenario, trade in services belonging to ‘other services’ is liberalised. As a consequence of this there would be an important, about 42% increase in EU exports in other services towards Azerbaijan. An important increase would occur in exports of textiles and apparel under all scenarios, the biggest increase occurring under the third scenario. The increase in exports would be between 156-173% depending on the scenarios. Light manufacturing exports would also increase about 44-49% depending on the scenarios. When trade



liberalisation would occur also in agriculture and processed food sectors, these sectors would also experience an important increase in their exports towards Azerbaijan. There would be an increase in gas exports, which according to the graph is important in terms of percentage change compared to the baseline scenario. The table below shows the percentage changes compared to the baseline together with the share of exports in each sector. The share of gas and oil sector's exports is very close to zero, thus the increase shown in the graph in the exports of gas to Azerbaijan in terms of level is minimal.

**Table 9.3.2. Percentage changes in sectoral exports of the EU**

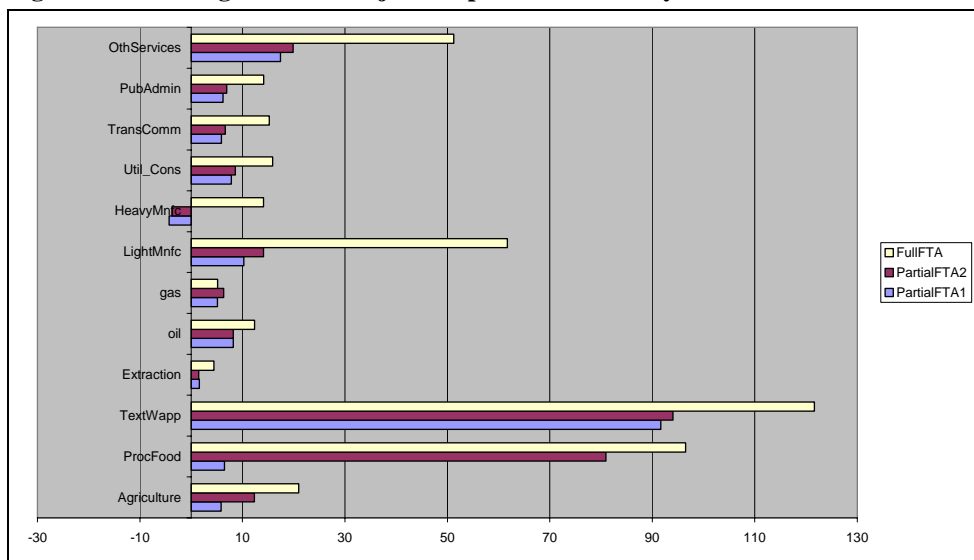
	<b>Partial FTA 1</b>	<b>Partial FTA 2</b>	<b>Full FTA</b>	<b>Share in total exports</b>
Agriculture	-9.13	105.44	122.10	0.43%
Processed Food	-5.94	46.95	51.28	2.60%
Textiles and Apparel	156.42	156.11	173.41	1.13%
Extraction	8.33	8.61	14.94	0.02%
Oil	-23.99	-23.50	15.19	0.00%
Gas	-11.17	-13.99	259.98	0.00%
Light Manufacturing	44.54	43.77	49.63	10.89%
Heavy Manufacturing	25.35	25.09	32.84	38.53%
Utilities and Construction	-4.08	-4.49	-8.19	26.00%
Transport and Communication	-4.01	-4.53	-9.98	6.30%
Public Administration	-5.81	-6.58	-11.63	0.45%
Other Services	-7.46	-8.53	46.91	13.64%

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Figure 9.3.3 shows percentage changes in exports of Azerbaijan by each sector towards the EU. Similarly to the case of EU exports in services, an important increase would occur in other services exports if trade would be liberalised between the EU and the CIS in these sectors.

While there would be a few percentage points reductions in exports of heavy manufacturing under the first two FTA scenarios, in all other cases there would be increases in exports from Azerbaijan towards the EU. The most pronounced increase would occur in the textiles and apparel sectors. Under the first and second scenarios, the increase would be around 92% and would be 122% in case of full liberalisation. Exports in light manufacturing would increase by 10-14% under the two first scenarios and by 62% in case of full liberalisation. Increase in exports of processed food and agricultural products would take place under all three scenarios, the effect being small in case of no liberalisation in agriculture and becoming important once liberalisation in the agriculture and food sectors would also take place.

Figure 9.3.5. Changes in Azerbaijan’s exports to the EU by sector



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Table 9.3.3. Percentage changes in sectoral exports of Azerbaijan

	Partial FTA 1	Partial FTA 2	Full FTA	Share in total exports
Agriculture	5.84	12.34	21.00	2.18%
Processed Food	6.50	80.94	96.51	0.39%
Textiles and Apparel	91.65	94.03	121.64	0.12%
Extraction	1.59	1.49	4.43	0.04%
Oil	8.21	8.21	12.36	66.08%
Gas	5.14	6.35	5.15	0.00%
Light Manufacturing	10.27	14.10	61.70	0.62%
Heavy Manufacturing	-4.29	-3.76	14.11	16.14%
Utilities and Construction	7.83	8.62	15.88	0.83%
Transport and Communication	5.88	6.67	15.24	8.22%
Public Administration	6.20	6.92	14.15	0.62%
Other Services	17.41	19.89	51.24	4.76%

Table 9.3.3 shows the percentage changes in Azerbaijan’s sectoral exports together with the share of each sector in total exports towards the EU in the baseline. Although the most important increase would occur in the textiles and apparel sector with exports to the EU increasing by 91-122% depending on the scenario, this sector only represents a small share of exports in total exports. Less than 1% of exports occur in these sectors. In the exports of goods the second most important increase would occur in processed food. Again, this sector represents only a very

small share of total exports therefore the change after the different FTAs in level would be only very small.

### 9.3.4. Other Macroeconomic Results

In this section other macroeconomic results, such as changes in wages and GDP are discussed. These results are summarized in Table 9.3.4 and Table 9.3.5 below. Azerbaijan would have an increase of 2.32% in its GDP under the full FTA scenario which is shown in Table 9.3.4. This increase is higher than the average increase in CIS.

Azerbaijan would experience an increase in wages for unskilled workers and a very limited increase for skilled workers. The wages for unskilled workers would increase by 2.1% which is higher than an increase which would take place in other CIS countries. On the other hand, wages for skilled workers would almost remain unchanged, unlike in other CIS countries.

**Table 9.3.4. Macroeconomic results from Full FTA (in %)**

	EU	CIS	Azerbaijan
Change in GDP	0.18	1.19	2.32
Unskilled worker wage	0.26	1.56	2.10
Skilled worker wage	0.24	1.47	0.05

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

**Table 9.3.5. Macroeconomic results from Partial 1 & 2 trade agreement**

	Partial 1 trade agreement			Partial 2 trade agreement		
	EU	CIS	Azerbaijan	EU	CIS	Azerbaijan
Change in GDP	0.12	-0.13	0.54	0.10	-0.35	0.61
Unskilled worker wage	0.18	0.22	1.2	0.18	0.16	1.1
Skilled worker wage	0.16	0.32	1.72	0.15	0.36	2.06

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The results with regards to the effect on other macroeconomic variables of the more realistic scenarios of trade agreements are summarized in Table 9.3.5 below. These results are different in magnitude and represent smaller increases than the full FTA scenario. The first scenario would result in a small, 0.54% increase in the GDP while the second scenario would have a slightly higher positive effect.

Both skilled and unskilled workers in Azerbaijan would experience an increase in their wages unlike under the full FTA scenario in which case only wages for unskilled workers changed. The changes in wages in Azerbaijan would be significantly higher than those experienced by workers on average in the CIS or in the EU. The increase in wages in Azerbaijan would be higher for skilled workers and lower for unskilled workers under the first two FTA scenarios unlike in the third scenario where only the wages of unskilled workers would change significantly.

### **9.3.5. Terms of Trade Effects**

The table below shows terms of trade effects in the case of full free trade agreement with liberalization not being limited to only agriculture and manufacturing products but also services trade and technical barriers. While the EU would have small terms of trade improvement amounting to about 0.11%, the CIS on average would experience 0.83% deterioration and the terms of trade deterioration would amount to 0.7% in the case of Azerbaijan.

**Table 9.3.6. Terms of trade results from Full FTA (in %)**

	<b>EU</b>	<b>CIS</b>	<b>Azerbaijan</b>
Terms of trade effects	0.11	-0.83	-0.70

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The terms of trade effects for the two other forms of trade liberalisation are presented in the table below. Azerbaijan again, similarly to the full FTA case would experience a terms of trade deterioration however it would be slightly lower under the first two FTAs than under full FTA liberalization. The decrease in terms of trade would be slightly smaller in magnitude under the first and second scenarios than what would take place in CIS countries.

**Table 9.3.7. Terms of trade results from Partial 1 & 2 trade agreement**

	<b>Partial 1 trade agreement</b>			<b>Partial 2 trade agreement</b>		
	<b>EU</b>	<b>CIS</b>	<b>Azerbaijan</b>	<b>EU</b>	<b>CIS</b>	<b>Azerbaijan</b>
Terms of trade effects	0.09	-0.63	-0.47	0.10	-0.76	-0.55

Source: Model simulations. Note: All results are reported as percentage change compared to baseline

## **9.4. Conclusions**

In this study we explore the economic effects of potential measures to liberalize trade between the European Union and Azerbaijan. In so doing, we have a Computable General Equilibrium Model, CGE Model, based on the most recent version of the GTAP data base, i.e. GTAP 7, which is benchmarked to data from 2004. Our CGE model follows recent research in trade theory in taking differences in underlying industry specific market structures and elasticities into account. Furthermore, the model incorporates estimated non-tariff trade barriers to trade in services, stemming from industry-specific gravity equation, which enhances the analysis of the service sector. The results are compared to a baseline which incorporates recent developments in the trade policy environment, i.e. the phase out of ATC, enlargement of the EU and CIS accessions to the WTO. The analysis takes agricultural liberalization, liberalization in industrial tariffs, and liberalization in services trade as well as trade facilitation measures into account.

The EU is a very important trading partner for Azerbaijan. On the other hand, the share of EU's trade with Azerbaijan in its total trade is marginal. Furthermore, CIS as a region represents only a relatively small share of EU trade. As a consequence of this asymmetric relationship the effects of an FTA between the EU and the CIS would have asymmetric effects on the EU and Azerbaijan. The impact of an FTA would be more pronounced for Azerbaijan and rather marginal for the EU.

Only a rather limited income effect would occur in the EU as a consequence of the FTAs while the income effect in Azerbaijan would be higher in magnitude. While Azerbaijan would experience a negative income effect under the first two FTA scenarios which only incorporate elimination of tariffs in goods the effect for the EU would be small but positive. Real income effects for Azerbaijan would be positive only if a full FTA incorporating liberalisation in services and reduction in technical barriers to trade would be implemented.

The change in GDP in Azerbaijan would be positive under all the three FTAs however would be rather small under the first two scenarios. The full FTA would provide significantly higher benefits for Azerbaijan.

# 10. Country Study: Georgia

## 10.1. Introduction

The EU has become the main trade partner of Georgia. On the other hand, for the EU, Georgia is a very marginal trade partner and trade with Georgia represents a very limited share of total EU trade. The EU exports mainly machinery and transport equipment to Georgia. Georgia mainly exports mineral fuels, which represents about 60% of its total exports to the EU and agricultural products, which is around 17% of total exports.

The framework for the EU bilateral trade relations with Georgia is governed by the Partnership and Cooperation Agreement (PCA), which entered into force in 1999. The agreement implies Most Favoured Nation (MFN) treatment with respect to tariffs and quantitative restrictions are prohibited in bilateral trade. The PCA also envisage progressive regulatory approximation in the most important trade related areas (industrial standards, sanitary and phytosanitary issues, intellectual property rights, customs, public procurement etc). Furthermore, Georgia is a beneficiary of the EU Generalised System of Preferences.

The EU adopted a European Neighborhood Policy (ENP) Action Plan with Georgia in 2006. The Action Plan covers various issues and has a specific point on future enhancement of bilateral trade relations between the EU and Georgia which includes a possible establishment of a Free Trade Agreement (FTA).

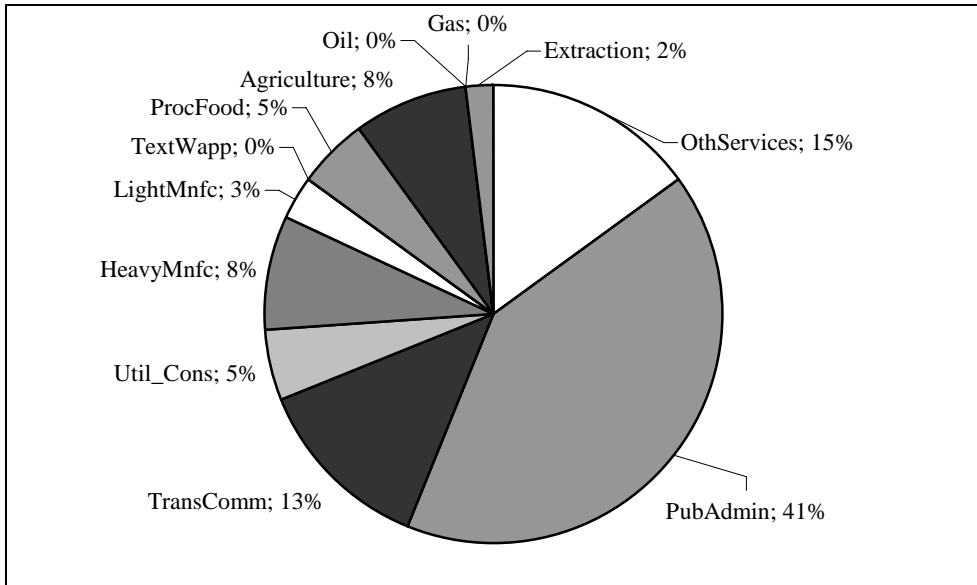
The rest of the study is organized as follows; Section 10.2 offers a general background to the production and trade of Georgia. Section 10.3 discusses the results. Concluding comments can be found in Section 10.4.

## 10.2. Trade and Production structure of Georgia

The importance of different sectors in Georgia's output is depicted in Figure 10.2.1. Services represent about 70% of output in Georgia which is higher than in many other CIS countries. Among manufacturing sectors heavy manufacturing

sectors take up the most important part of total output, representing about 8% of total output followed by light manufacturing which takes up only 3% of total output. Agricultural output is 8% of total output which is similar to the share of sector in some other CIS countries, such as Ukraine, Kazakhstan or Russia (8-9%). Processed food contributes 5% of total output.

**Figure 10.2.1. Share of sectors in Georgia's output in 2004**

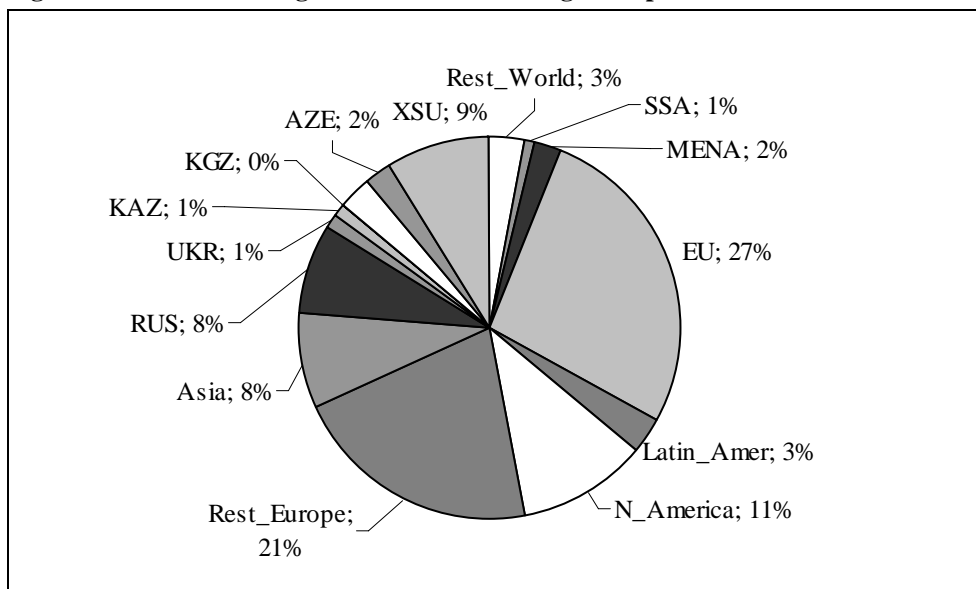


Source: own calculations, data come from GTAP database version 7.

Figure 10.2.2 depicts the importance of different regions and countries in Georgia's exports. The EU is the most important export destination for Georgia. About 27% of all Georgia's exports go to the EU. An important share, about one fourth of Georgia's exports are going to countries in Europe outside the EU and the CIS. Russia is also an important export partner; Russia is the destination of 8% of total exports. Other CIS countries together take up a bit more than 15% of total exports of Georgia.

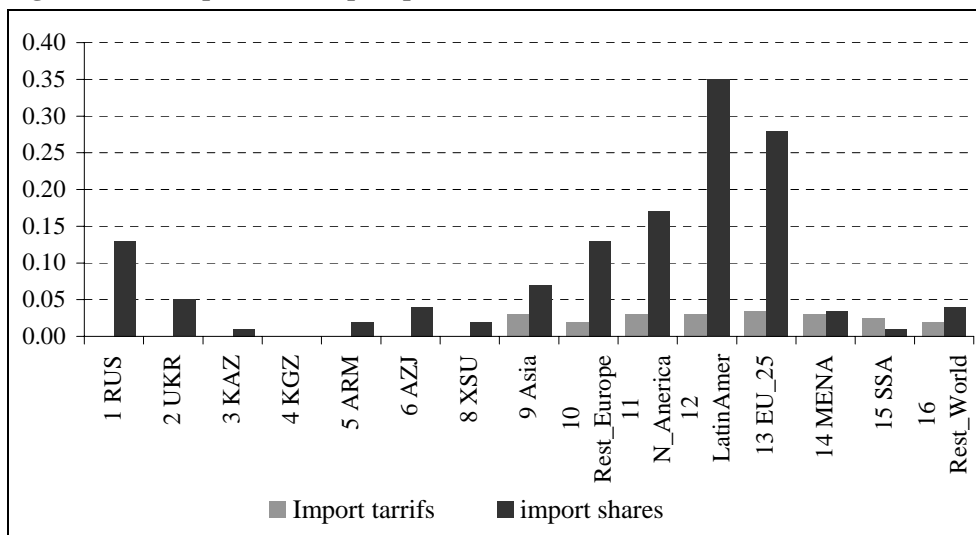
Figure 10.2.3 depicts Georgia imports coming from different destinations and the corresponding import tariffs. For Georgia, the EU is the most important import partner with imports coming from the EU representing about one quarter of total Georgian imports. There are no import tariffs for other countries in the CIS region, nevertheless the share of imports coming from these countries is rather small with the exception of Russia from where a bit more than 10% of total imports originate.

**Figure 10.2.2. Share of regions/countries in Georgia's exports in 2004**



Source: own calculations, data come from GTAP database version 7.

**Figure 10.2.3. Imports and import protection in 2004**



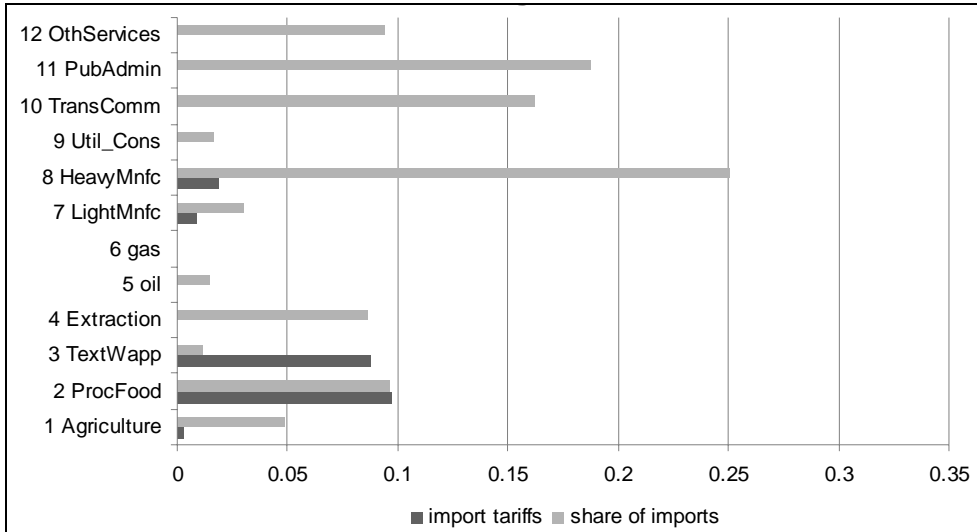
Source: own calculations, data come from GTAP database version 7.

Figure 10.2.4 shows EU import tariffs and import in different sectors originating from Georgia. The highest import tariffs are in the processed food sector and in textiles and clothing. The share of imports in textiles and apparel sectors is rather small; imports in these sectors is around 1% while in processed food it is



much higher amounting to almost 10% of total imports. The sector with the highest share of imports apart from imports in services is heavy manufacturing which represents one fourth of total imports and extractions which is around 8% of total imports from Georgia.

**Figure 10.2.4. EU imports and import tariffs in 2004**



Source: own calculations, data come from GTAP database version 7

### 10.3. Results

#### 10.3.1. Real Income Effects

Trade liberalization would have a positive income effect for Georgia under the second and third scenarios which are shown in Table 10.3.1. However, a small negative effect would occur under the first FTA scenario which would result in a 0.03% real income reduction which is much smaller than the effects in the EU or in the CIS on average. The second FTA scenario which would involve liberalization in agriculture and processed food sectors as well would have a small positive real income effect. The third, full FTA scenario would have the highest positive real income effect with a 0.68% real income increase which is similar to the effects on CIS’s real income.

**Table 10.3.1: Real Income Effects (percentage change from baseline)**

Scenario	Partial 1 trade agreement	Partial 2 trade agreement	Full FTA
EU	0.14	0.13	0.21
CIS	-0.53	-0.83	0.62
Georgia	-0.03	0.12	0.68

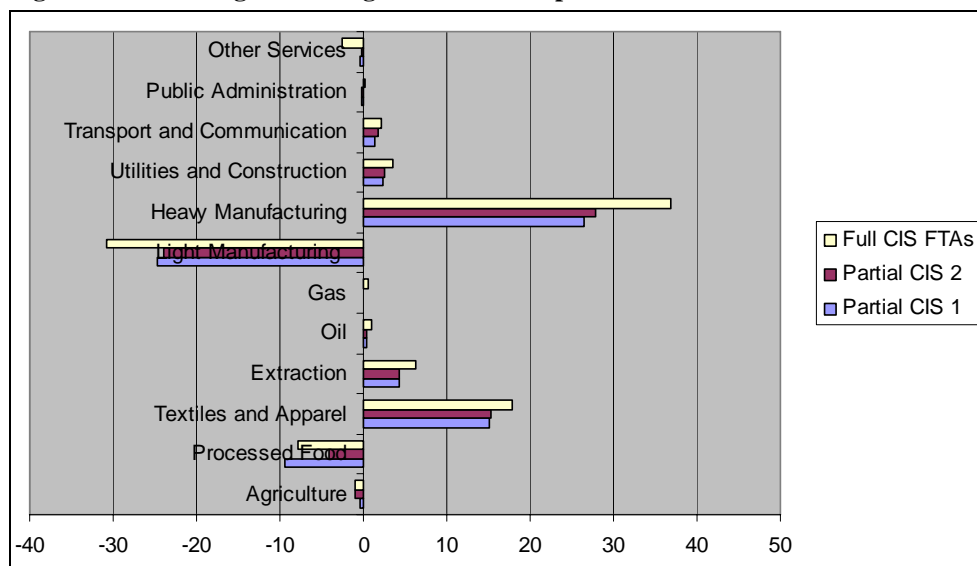
Source: Model simulations.

### 10.3.2. Changes in sectoral output in Georgia

Our analysis shows that important changes would occur in the sectoral output of Georgia as a result of three different scenarios of trade liberalisation. (see Figure 10.3.1).

The most pronounced decrease would take place in the light manufacturing sectors: by around 25% in the first two scenarios and somewhat higher, around 30% under the full FTA. Apart from light manufacturing sectors, processed food products would also experience a drop in their output which would be the highest under the first FTA with a magnitude of 10% and somewhat lower under the two other FTA scenarios.

**Figure 10.3.1. Changes in Georgia’s sectoral output**



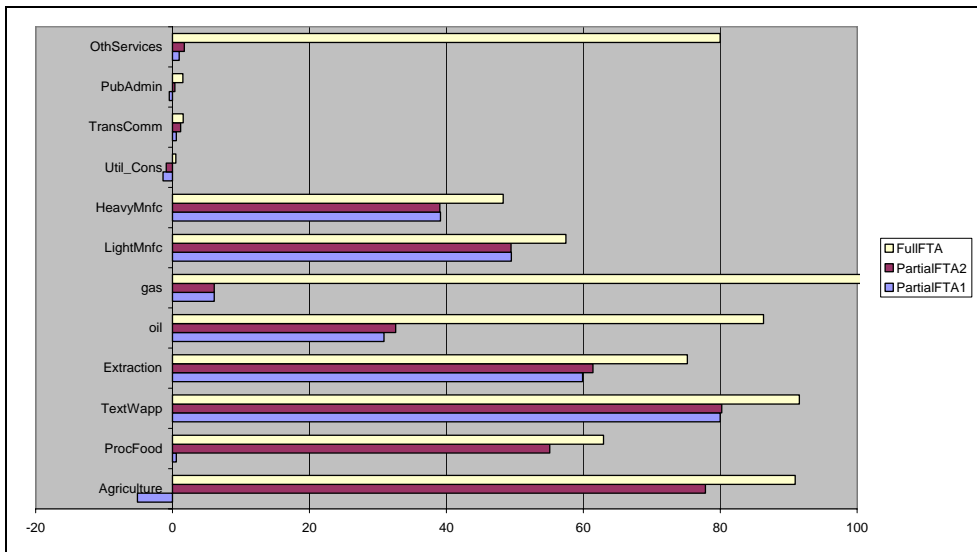
Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Most other sectors would have a small increase in the production under the different scenarios. Heavy manufacturing sectors would experience an important increase in their output (by 26-28%) under the first two scenarios and a 37% increase under the third type of FTA which would incorporate liberalization in services. Apart from heavy manufacturing an important increase would occur in textiles and apparel (by 15-18% depending on the scenario).

### 10.3.3. Effects on bilateral trade flows

In this section we provide detailed results on trade impacts in the three scenarios, and we present the changes in trade flows by sector.

**Figure 10.3.2 Changes in EU exports to Georgia by sector**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The Figure 10.3.2 depicts changes in EU exports towards Georgia after the three different FTA scenarios. Under the third scenario, trade in services sectors belonging to ‘other services’ is liberalised. As a consequence of this there would be an important, about 80% increase in EU exports in other services sectors towards Georgia. An important increase would occur in exports of textiles and apparel under all scenarios, the biggest increase occurring under the third scenario. The exports in these sectors would increase by 80-90% towards Georgia. Extractions, heavy and light manufacturing exports would also increase under all differ-

ent scenarios. The highest increase would occur under the third, full FTA scenario which would result in 75% increase in exports of extractions, 57% increase in light manufacturing, and 48% increase in heavy manufacturing. When trade liberalisation would occur also in agriculture and processed food sectors, these sectors would also experience an important increase in their exports towards Georgia. There would be an increase in gas exports, which according to the graph is important in terms of percentage change compared to the baseline scenario. The table below shows the percentage changes compared to the baseline together with the share of exports in each sector. The share of gas and oil sector's exports is very close to zero, thus the increase shown in the graph in the exports of gas Georgia in terms of level is minimal.

**Table 10.3.2. Percentage changes in sectoral exports of the EU**

	<b>Partial FTA 1</b>	<b>Partial FTA 2</b>	<b>Full FTA</b>	<b>Share in total exports</b>
Agriculture	-5.14	77.84	90.94	1.51%
Processed Food	0.56	55.11	62.95	10.19%
Textiles and Apparel	79.99	80.21	91.56	2.06%
Extraction	59.89	61.40	75.21	0.07%
Oil	30.88	32.59	86.32	0.00%
Gas	6.07	6.10	271.93	0.00%
Light Manufacturing	49.49	49.44	57.46	18.20%
Heavy Manufacturing	39.13	39.03	48.30	47.88%
Utilities and Construction	-1.38	-0.92	0.49	0.77%
Transport and Communication	0.57	1.18	1.56	10.17%
Public Administration	-0.47	0.35	1.51	2.41%
Other Services	0.96	1.71	79.99	6.72%

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

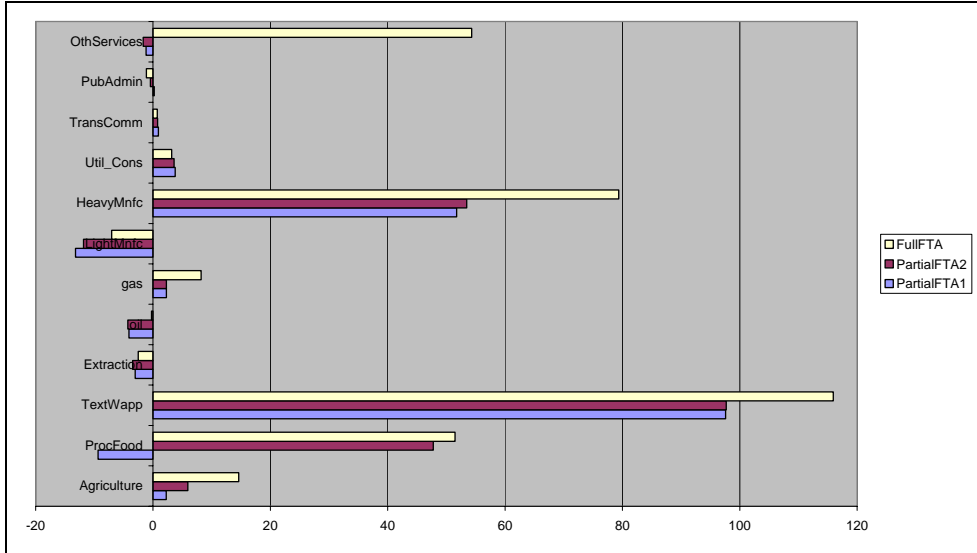
Figure 10.3.3 shows percentage changes in exports of Georgia by each sector towards the EU. Similarly to the case of EU exports in services, an important increase would occur in other services exports if trade would be liberalised between the EU and the CIS in these sectors.

There would be a reduction in exports of oil, extractions, and light manufacturing under all three FTA scenarios. In some other sectors, such as in processed food reductions would occur under only certain FTA scenarios.

The most pronounced increase would occur in the textiles and apparel sectors. Under the first and second scenarios, the increase would be 97% and would be around 116% in case of full liberalisation. Exports in heavy manufacturing would increase by 52-53% under the two first scenarios and by 79% in case of full liber-

alisation. Increase in exports of processed food would take place under the second and third FTA which would incorporate elimination of agricultural tariffs.

**Figure 10.3.3. Changes in Georgian exports to the EU by sector**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

**Table 10.3.3. Percentage changes in sectoral exports of Georgia**

	Partial FTA 1	Partial FTA 2	Full FTA	Share in total exports
Agriculture	2.26	5.93	14.62	4.91%
Processed Food	-9.36	47.77	51.47	9.13%
Textiles and Apparel	97.58	97.68	115.92	1.07%
Extraction	-3.04	-3.48	-2.51	8.51%
Oil	-4.08	-4.28	-0.25	1.46%
Gas	2.28	2.28	8.21	0.00%
Light Manufacturing	-13.20	-11.84	-7.04	2.90%
Heavy Manufacturing	51.76	53.45	79.37	23.50%
Utilities and Construction	3.78	3.59	3.16	1.75%
Transport and Communication	0.93	0.80	0.73	17.05%
Public Administration	0.23	-0.43	-1.14	19.83%
Other Services	-1.18	-1.69	54.29	9.90%

Table 10.3.3 shows the percentage changes in sectoral exports together with the share of each sector in total exports towards the EU in the baseline. Although the most important increase would occur in the textiles and apparel sector with exports

to the EU increasing by 116% under the full FTA scenario, this sector only represents a small share of exports in total exports (only 1%).

### 10.3.4. Other Macroeconomic Results

In this section other macroeconomic results, such as changes in wages and GDP are discussed. These results are summarized in Table 10.3.4 and Table 10.3.5 below. Georgia would have an increase of 1.18% in its GDP under the full FTA scenario which is shown in Table 10.3.4. This increase is very similar to the average increase in the CIS.

Georgia would experience an increase in wages for both the skilled and unskilled workers. This increase would be somewhat higher than those reported for the CIS average for the wages of skilled workers where 1.64% increase would occur. The increase in Georgian wages for unskilled workers would be around 1.35%.

**Table 10.3.4. Macroeconomic results of Full FTA (in %)**

	EU	CIS	Georgia
Change in GDP	0.18	1.195	1.18
Unskilled worker wage	0.26	1.56	1.64
Skilled worker wage	0.24	1.47	1.35

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

**Table 10.3.5. Macroeconomic results from Partial 1 & 2 trade agreement**

	Partial 1 trade agreement			Partial 2 trade agreement		
	EU	CIS	Georgia	EU	CIS	Georgia
Change in GDP	0.12	-0.13	0.24	0.10	-0.35	0.67
Unskilled worker wage	0.18	0.22	0.77	0.18	0.16	1.16
Skilled worker wage	0.16	0.32	0.49	0.15	0.36	0.85

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The results with regards to the effect on other macroeconomic variables of the more realistic scenarios of trade agreements are summarized in Table 10.3.5 below. These results are different in magnitude and represent smaller increases than the full FTA scenario. The first scenario would result in a small, 0.24% increase in the GDP while the second scenario would have a slightly higher positive effect.

Both skilled and unskilled workers in Georgia would experience an increase in their wages similarly to the full FTA scenario although the effects would be lower.

The changes in wages in Georgia would be higher than those experienced by workers on average in the CIS or in the EU. The increase in wages in Georgia would be higher for unskilled workers and lower for skilled workers under all three FTA scenarios.

### 10.3.5. Terms of Trade Effects

The Table 10.3.6 shows terms of trade effects in the case of full free trade agreement with liberalization not being limited to only agriculture and manufacturing products but also services trade and technical barriers. While the EU would have small terms of trade improvement amounting to about 0.11%, the CIS on average would experience 0.83% deterioration and the terms of trade deterioration would amount to 0.69% in the case of Georgia.

**Table 10.3.6. Terms of trade results from Full FTA (in %)**

	EU	CIS	Georgia
Terms of trade effects	0.11	-0.83	-0.69

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The terms of trade effects for the two other forms of trade liberalisation are presented in the Table 10.3.7. Georgia again, similarly to the full FTA case would experience a terms of trade deterioration however it would be slightly lower under the first two FTAs than under full FTA liberalization. The decrease in terms of trade would be slightly smaller in magnitude under the first and second scenarios than the CIS average terms of trade changes. On the other hand the terms of trade gains for the EU would be significantly much smaller than for Georgia and always positive.

**Table 10.3.7. Terms of trade results from Partial 1 & 2 trade agreement**

	Partial 1 trade agreement			Partial 2 trade agreement		
	EU	CIS	Georgia	EU	CIS	Georgia
Terms of trade effects	0.09	-0.63	-0.5	0.10	-0.76	-0.67

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

## **10.4. Conclusions**

In this study we explore the economic effects of potential measures to liberalize trade between the European Union and Georgia. In so doing, we have a Computable General Equilibrium Model, CGE Model, based on the most recent version of the GTAP data base, i.e. GTAP 7, which is benchmarked to data from 2004. Our CGE model follows recent research in trade theory in taking differences in underlying industry specific market structures and elasticities into account. Furthermore, the model incorporates estimated non-tariff trade barriers to trade in services, stemming from industry-specific gravity equation, which enhances the analysis of the service sector. The results are compared to a baseline which incorporates recent developments in the trade policy environment, i.e. the phase out of ATC, enlargement of the EU and CIS accessions to the WTO. The analysis takes agricultural liberalization, liberalization in industrial tariffs, and liberalization in services trade as well as trade facilitation measures into account.

The EU is a very important trading partner for Georgia. On the other hand, Georgia is only a very small trading partner for the EU compared to other countries. Furthermore, CIS as a region represents only a relatively small share of EU trade. As a consequence the FTA between the EU and the CIS would have asymmetric effects on both sides. The impact of an FTA would be more pronounced for Georgia and rather marginal for the EU.

Only a rather limited income effect would occur in the EU as a consequence of the FTAs while the income effect in Georgia would be higher in magnitude under the full FTA scenario. While Georgia would experience a very small, negative income effect under the first FTA scenario, a positive but small income effect under the third and a somewhat higher positive effect under the full FTA, the effect for the EU would be small but positive.

The change in GDP on the other hand would be positive for both regions the effect being much higher for Georgia under all the three different scenarios. The highest GDP increase for Georgia would take place in case of a full FTA while the change in GDP would be significantly smaller under the first FTA.



# 11. Country Study: Kazakhstan

## 11.1. Introduction

Kazakhstan is the EU's largest trade partner in the Central Asian region. The EU imports from Kazakhstan are dominated by energy products (around 80% of the total), while the main EU exports to Kazakhstan are machinery, transport vehicles and chemicals products.

The EU has bilateral trade relations with Kazakhstan based on the Partnership and Cooperation Agreement (PCA). The PCA, which has been in force since 1999, establishes the basis for trade liberalisation and gradual economic rapprochement. The agreement includes the foundations of a broad economic co-operation in the several areas.

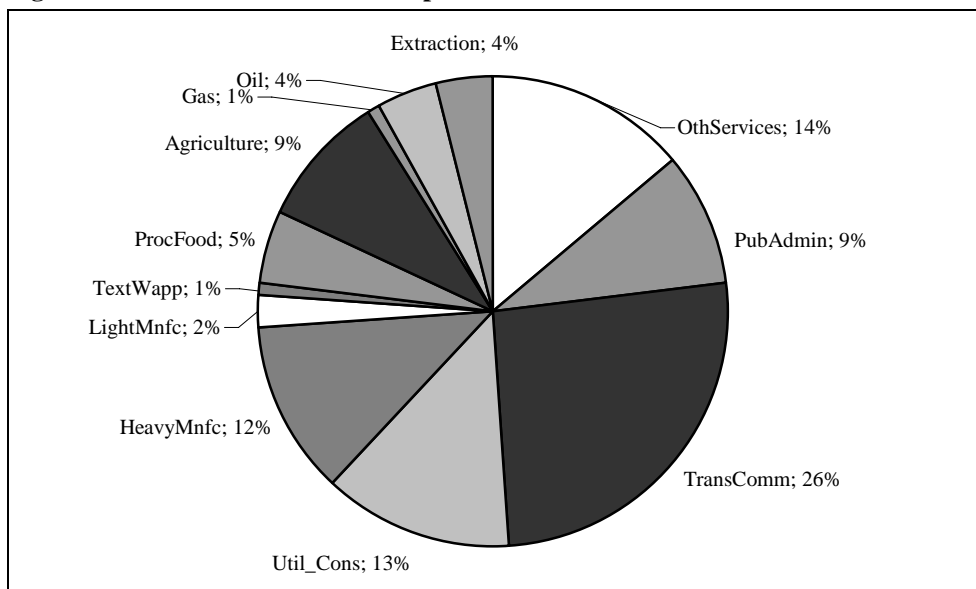
In 2007 the European Council adopted the document titled “The EU and Central Asia: Strategy for a New Partnership”, which outlines the EU strategy towards this sub-region. Furthermore, Kazakhstan is beneficiary of the Generalized System of Preferences of the EU.

The rest of the study is organized as follows: Section 11.2 offers a general background to the production and trade of Kazakhstan. Section 11.3 discusses the results. Concluding comments can be found in Section 11.4.

## 11.2. Trade and Production structure of Kazakhstan

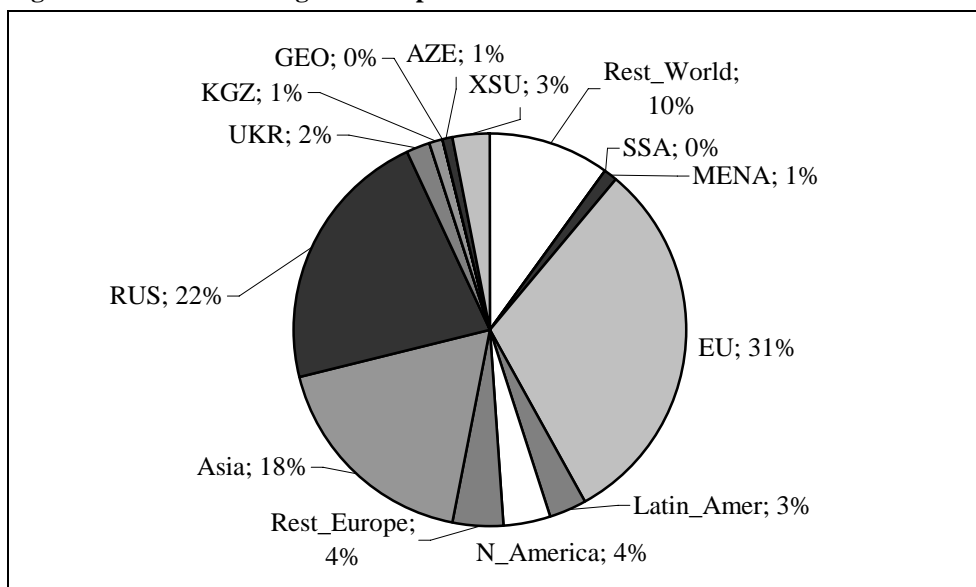
The importance of different sectors in Kazakhstan's output is depicted in Figure 11.2.1. The share of services in total output is about two-thirds. Among manufacturing sectors heavy manufacturing sectors take up the most important part of total output (about 12%). On the other hand output in light manufacturing sectors is rather small - around 2% of total output. Agricultural output is 9% of total which is similar to the importance of this sector in other CIS countries, such as Ukraine, or Russia. Processed food contributes 5% of total output.

**Figure 11.2.1. Share of sectors in output of Kazakhstan in 2004**



Source: own calculations, data come from GTAP database version 7.

**Figure 11.2.2. Share of regions in exports of Kazakhstan in 2004**



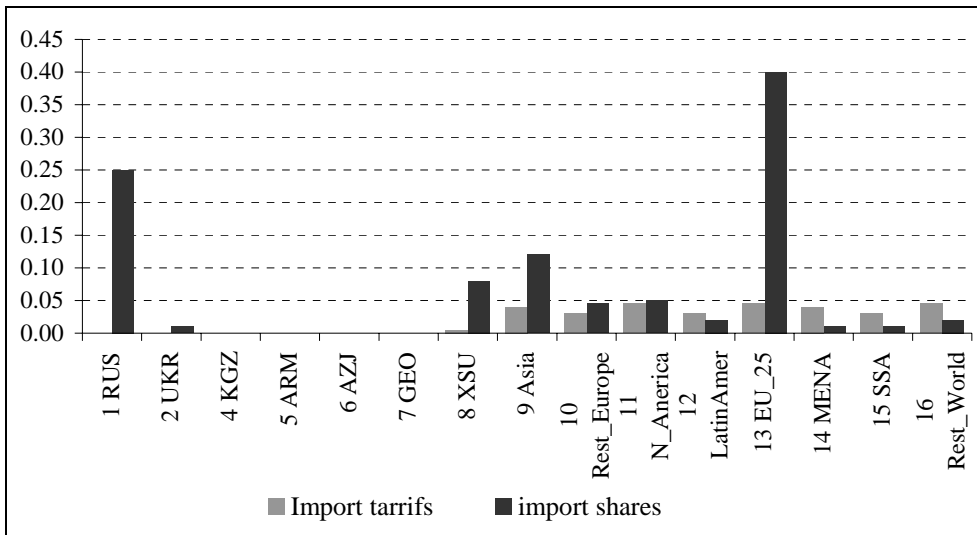
Source: own calculations, data come from GTAP database version 7.

Figure 11.2.2 depicts the importance of different regions and countries in Kazakhstan's exports. The EU is the most important export destination. About

31% of all Kazakhstan’s exports go to the EU. The second biggest export destination is within the CIS region. About 22% of Kazakhstan’s exports go to Russia. Other CIS countries are less important. A relatively important share, almost one fifth of Kazakhstan’s exports go to other non-CIS countries in Asia.

Figure 11.2.3 depicts Kazakhstan imports coming from different destinations and the corresponding import tariffs. Similarly to exports, the EU is the most important import partner, representing about 40% of total Kazakhstan’s imports. There are no import tariffs for other countries in the CIS region; nevertheless the share of imports coming from these countries is rather small with the exception of Russia from which 25% of imports are originating.

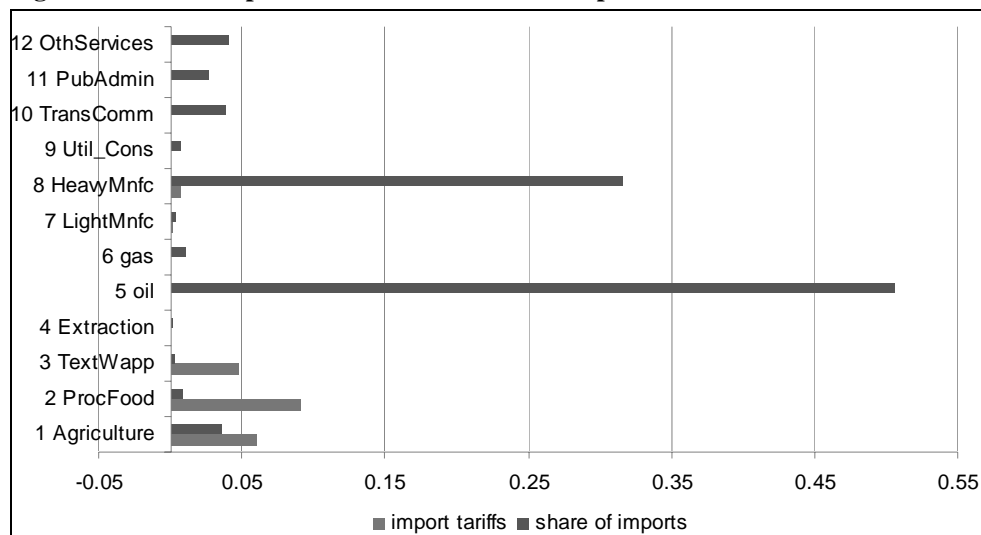
**Figure 11.2.3. Imports and import protection in Kazakhstan in 2004**



Source: own calculations, data come from GTAP database version 7.

Figure 11.2.4 shows EU import tariffs and import in different sectors originating from Kazakhstan. The highest import tariffs are in the processed food sector, in agricultural products and in textiles and clothing. The share of imports in these sectors is rather small; import share of agricultural products is around 6% while in the other two sectors imports are very limited. The sector with the highest share of imports is oil which represents half of total imports from Kazakhstan. The second most important sector with respect to imports is heavy manufacturing which represents about one-third of total imports.

**Figure 11.2.4. EU imports from Kazakhstan and import tariffs in 2004**



Source: own calculations, data come from GTAP database version 7.

## 11.3. Results

### 11.3.1. Real Income Effects

Trade liberalization would have a positive income effect for Kazakhstan under all three scenarios which is shown in Table 11.3.1. The smallest effect would occur under the first FTA scenario which would result in a 0.17% real income increase, which is slightly higher than the effects in the EU. The second FTA scenario which would involve liberalization in agriculture and processed food sectors as well would have a very similar real income effect as the first scenario. On the other hand, the third, full FTA scenario would have a high positive real income effect of 2.06 %, much higher than the average effects in the EU and the CIS.

**Table 11.3.1. Real Income Effects (percentage change from baseline)**

Scenario	Partial 1 trade agreement	Partial 2 trade agreement	Full FTA
EU	0.14	0.13	0.21
CIS	-0.53	-0.83	0.62
Kazakhstan	0.17	0.18	2.06

Source: Model simulations.

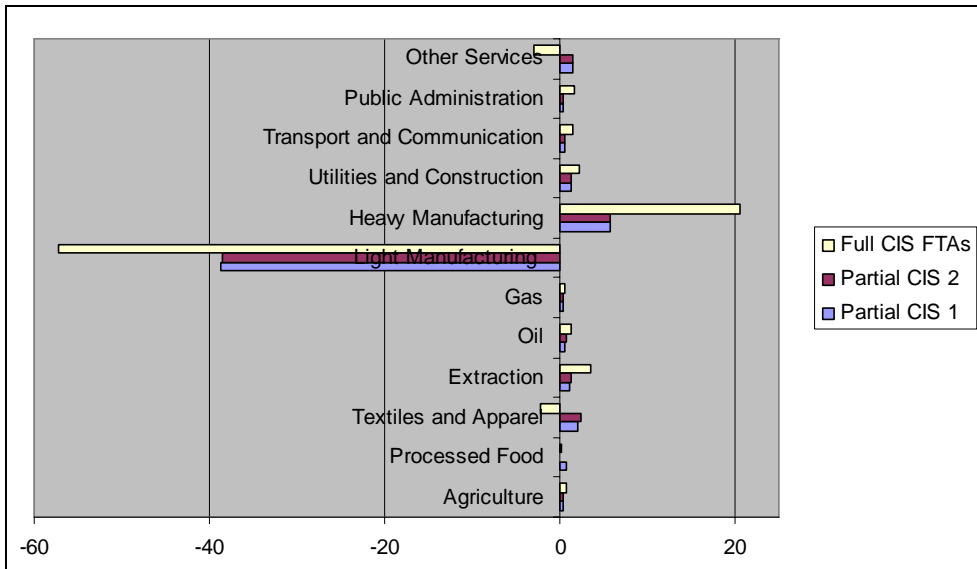
### 11.3.2. Changes in sectoral output in Kazakhstan

Our analysis shows that important changes would occur in the sectoral output of Kazakhstan as a result of different forms of trade liberalisation. Figure 11.3.1 depicts these changes after the three different FTA would take place.

The most pronounced decrease would take place in the light manufacturing sector: in the magnitude of 38% in case of the first two scenarios and much higher, i.e. 57% under the full FTA scenario.

Most other sectors would have a small increase in their production under the different scenarios. The only sector where important increase in output would occur under all three scenarios is the heavy manufacturing: the highest under the full FTA (a 20% increase).

**Figure 11.3.1. Changes in sectoral output of Kazakhstan**



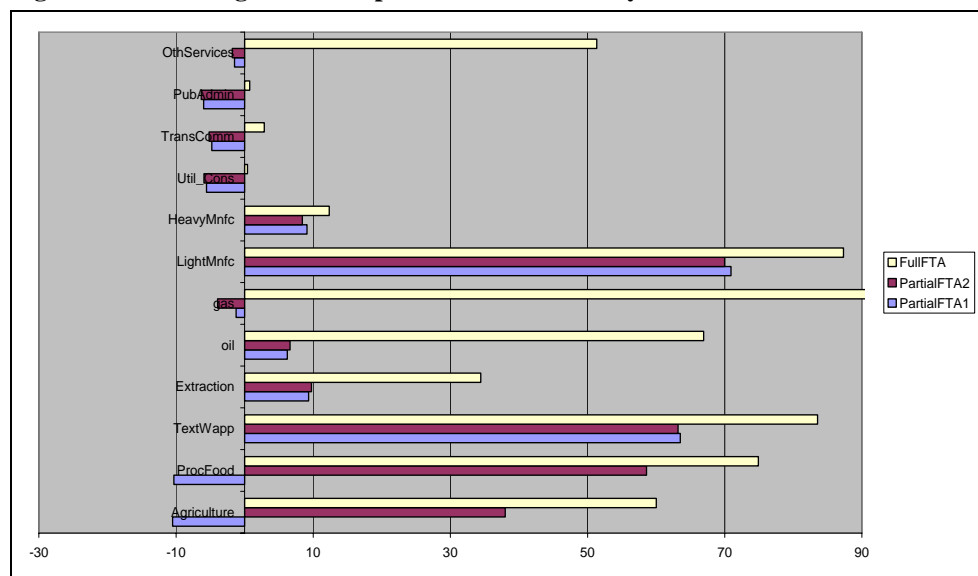
Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

### 11.3.3. Effects on bilateral trade flows

In this section we provide detailed results on trade impacts in the three scenarios, and we present the changes in trade flows by sector.

The Figure 11.3.2 depicts changes in EU exports towards Kazakhstan after the three different FTA scenarios. The services sectors experience a small reduction in the first two scenarios. Under the third scenario, trade in ‘other services’ is liberalised. As a consequence of this there would be an important, about 50% increase in EU exports in other services towards Kazakhstan. An important increase would occur in exports of light manufacturing and textiles and apparel under all scenarios, the biggest increase occurring under the third scenario. The exports in these light manufacturing would increase by 70% under the first two scenarios and about 87% under the third scenario. When trade liberalisation would occur also in agriculture and processed food sectors, these sectors would also experience an important increase in their exports towards Kazakhstan. There would be an increase in gas and oil exports, which according to the graph is important in terms of percentage change compared to the baseline scenario. The table below shows the percentage changes compared to the baseline together with the share of exports in each sector. The share of gas and oil sector’s exports is very close to zero, thus the increase shown in the graph in the exports of gas Kazakhstan in terms of level is minimal.

**Figure 11.3.2. Changes in EU exports to Kazakhstan by sector**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

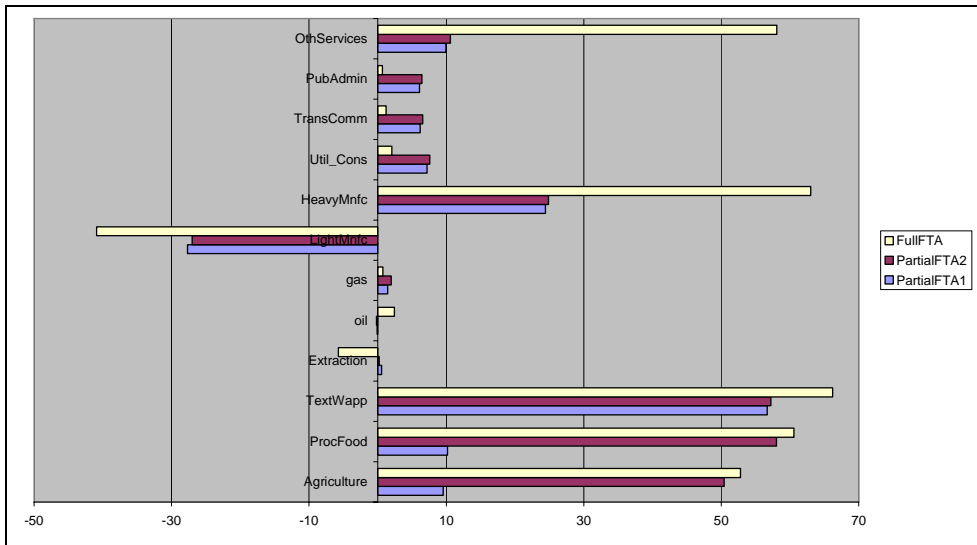
Figure 11.3.3 shows percentage changes in exports of Kazakhstan by each sector towards the EU. Similarly to the case of EU, an important increase would occur in other services exports if trade would be liberalised between the EU and the CIS in these sectors.

**Table 11.3.2. Percentage changes in sectoral exports of the EU to Kazakhstan**

	Partial FTA 1	Partial FTA 2	Full FTA	Share in total exports
Agriculture	-10.51	38.01	60.01	0.51%
Processed Food	-10.32	58.61	74.90	1.71%
Textiles and Apparel	63.51	63.19	83.56	1.20%
Extraction	9.33	9.74	34.43	0.18%
Oil	6.21	6.63	66.92	0.00%
Gas	-1.24	-3.95	303.04	0.00%
Light Manufacturing	70.92	69.98	87.33	23.02%
Heavy Manufacturing	9.09	8.43	12.34	37.73%
Utilities and Construction	-5.57	-5.93	0.42	6.58%
Transport and Communication	-4.79	-5.19	2.87	4.97%
Public Administration	-5.97	-6.33	0.74	0.73%
Other Services	-1.47	-1.79	51.35	23.37%

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

**Figure 11.3.3. Changes in Kazakhstan’s exports to the EU by sector**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Reduction in export flows towards the EU would occur only in light manufacturing sector. This sector would experience a drop in exports under all scenarios with the decrease around 41% under the full FTA scenario. In exports of all other sectors increase would take place. The most pronounced increase would occur in the textiles and apparel sectors. Under the first and second scenarios, the increase

would be around 57% and it would be 66% in case of full liberalisation. Exports in heavy manufacturing would increase by 24-25% under the two first scenarios and by 63% in case of full liberalisation. Increase in exports of processed food and agricultural products would take place under all three scenarios, the effect being smallest in case of no liberalisation in agriculture and becoming important once liberalisation in the agriculture and food sectors would also take place.

Table 11.3.3 shows the percentage changes in sectoral exports together with the share of each sector in total exports towards the EU in the baseline. Although the most important increase would occur in the textiles and apparel sector with exports to the EU increasing by 57-66% depending on the scenario, this sector only represents a small share in total exports (less than 0.3%). In the exports of goods the second most important increase would occur in processed food followed by the increase in exports of agricultural products. Again, these sectors represent only a very small share of total exports therefore the change after the different FTAs in terms of level would be only very small.

**Table 11.3.3. Percentage changes in sectoral exports of Kazakhstan**

	<b>Partial FTA 1</b>	<b>Partial FTA 2</b>	<b>Full FTA</b>	<b>Share in total exports</b>
Agriculture	9.53	50.41	52.79	3.59%
Processed Food	10.16	58.03	60.57	0.88%
Textiles and Apparel	56.68	57.23	66.21	0.27%
Extraction	0.56	0.21	-5.70	0.14%
Oil	-0.07	-0.18	2.45	48.05%
Gas	1.46	1.96	0.75	0.98%
Light Manufacturing	-27.68	-27.01	-40.91	0.36%
Heavy Manufacturing	24.41	24.86	63.02	34.44%
Utilities and Construction	7.19	7.58	2.07	0.71%
Transport and Communication	6.17	6.55	1.23	3.76%
Public Administration	6.09	6.44	0.67	2.61%
Other Services	9.93	10.59	58.08	4.22%

### **11.3.4. Other Macroeconomic Results**

In this section other macroeconomic results, such as changes in wages and GDP are discussed. These results are summarized in Table 11.3.4 and Table 11.3.5 below. Kazakhstan would have an increase of 2.36% in its GDP under the full FTA scenario which is shown in Table 11.3.4. This increase is about two times higher than the average increase in the CIS. Furthermore, Kazakhstan would experience an increase in wages for both the skilled and unskilled workers. These increases would be higher than the averages of the CIS and the EU. The increase



in Kazakhstan wages would be around 2% for unskilled workers and about 1.6% for skilled workers.

**Table 11.3.4. Macroeconomic results from Full FTA (in %)**

	EU	CIS	Kazakhstan
Change in GDP	0.18	1.195	2.36
Unskilled worker wage	0.26	1.560	2.04
Skilled worker wage	0.24	1.470	1.65

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Other macroeconomic variables of the more realistic scenarios of trade agreements are summarized in Table 11.3.5 below. These results are different in magnitude and represent significantly smaller increases than the full FTA scenario. Both the first and the second scenario would result in an increase of 0.6% in GDP which is much lower than the increase which would take place under the full FTA scenario.

Both skilled and unskilled workers in Kazakhstan would experience an increase in their wages which would be higher than those experienced by workers on average in the CIS or in the EU and again significantly lower than the changes implied by a full FTA. The increase in wages in Kazakhstan would be higher for skilled workers and somewhat lower for unskilled workers under the first two FTA scenarios.

**Table 11.3.5. Macroeconomic results from Partial 1 & 2 trade agreement**

	Partial 1 trade agreement			Partial 2 trade agreement		
	EU	CIS	Kazakhstan	EU	CIS	Kazakhstan
Change in GDP	0.12	-0.13	0.63	0.10	-0.35	0.63
Unskilled worker wage	0.18	0.22	0.40	0.18	0.16	0.42
Skilled worker wage	0.16	0.32	0.60	0.15	0.36	0.63

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

### 11.3.5. Terms of Trade Effects

The table below shows terms of trade effects in the case of full free trade agreement with liberalization not being limited to only agriculture and manufacturing products but also services trade and technical barriers. While the EU would have small terms of trade improvement amounting to about 0.11%, the CIS on av-

erage would experience 0.83% deterioration and the terms of trade deterioration would amount to 0.53% in the case of Kazakhstan.

**Table 11.3.6. Terms of trade results from Full FTA (in %)**

	<b>EU</b>	<b>CIS</b>	<b>Kazakhstan</b>
Terms of trade effects	0.11	-0.83	-0.53

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The terms of trade effects for the two other forms of trade liberalisation are presented in the table below. Kazakhstan again, similarly to the full FTA case would experience a terms of trade deterioration however it would be slightly higher under the first two FTAs than under full FTA liberalization. The decrease in terms of trade would be similar in magnitude under the first and second scenario to the CIS average terms of trade changes. On the other hand the terms of trade gains for the EU would be significantly much smaller than for Kazakhstan and always positive.

**Table 11.3.7. Terms of trade results from Partial 1 & 2 trade agreement**

	<b>Partial 1 trade agreement</b>			<b>Partial 2 trade agreement</b>		
	<b>EU</b>	<b>CIS</b>	<b>Kazakhstan</b>	<b>EU</b>	<b>CIS</b>	<b>Kazakhstan</b>
Terms of trade effects	0.09	-0.63	-0.71	0.10	-0.76	-0.67

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

## 11.4. Conclusions

In this study we explore the economic effects of potential measures to liberalize trade between the European Union and Kazakhstan. In so doing, we have a Computable General Equilibrium Model, CGE Model, based on the most recent version of the GTAP data base, i.e. GTAP 7, which is benchmarked to data from 2004. Our CGE model follows recent research in trade theory in taking differences in underlying industry specific market structures and elasticities into account. Furthermore, the model incorporates estimated non-tariff trade barriers to trade in services, stemming from industry-specific gravity equation, which enhances the analysis of the service sector. The results are compared to a baseline which incorporates recent developments in the trade policy environment, i.e. the phase out of

ATC, enlargement of the EU and CIS accessions to the WTO. The analysis takes agricultural liberalization, liberalization in industrial tariffs, and liberalization in services trade as well as trade facilitation measures into account.

The EU is a very important trading partner for Kazakhstan. On the other hand, Kazakhstan is a small trading partner for the EU. Furthermore, CIS as a region represents only a relatively small share of EU trade. As a consequence the effects of an FTA would have asymmetric effects on the EU and Kazakhstan. The impact of an FTA would be more pronounced for Kazakhstan and rather marginal for the EU.

Only a rather limited income effect would occur in the EU as a consequence of the FTAs while the income effect in Kazakhstan would be higher in magnitude. While the income effect in Kazakhstan would be also rather small, close to the effect on the EU under the first two FTA scenarios which are only limited to liberalisation of tariffs, an important positive income effect would take place under the full FTA scenario.

Similarly to the income effects, the change in GDP in Kazakhstan would be positive under all the three FTAs however would be rather small under the first two scenarios. The full FTA would provide significantly higher benefits for Kazakhstan.

## **12. Country study: Kyrgyzstan**

### **12.1. Introduction**

Kyrgyzstan is a small country with only 5 million people and with a surface area of 198,500 square kilometres. The economy is predominantly agricultural; its exports include agricultural products and mineral extractions mainly.

Given the size of the country and some other factors, the EU-Kyrgyzstan trade relations are rather limited. The EU has bilateral trade relations with Kyrgyzstan based on the Partnership and Cooperation Agreement (PCA). The PCA implies most-favoured nation (MFN) status with respect to tariffs. The agreement also contains provisions on the elimination of quantitative restrictions and regulation of other trade-related matters, including competition and state aids. The PCA has been in force since 1999.

In 2007 the European Council adopted the document titled “The EU and Central Asia: Strategy for a New Partnership”, which outlines the EU strategy towards this sub-region. Furthermore, Kyrgyzstan is beneficiary of the Generalized System of Preferences of the EU.

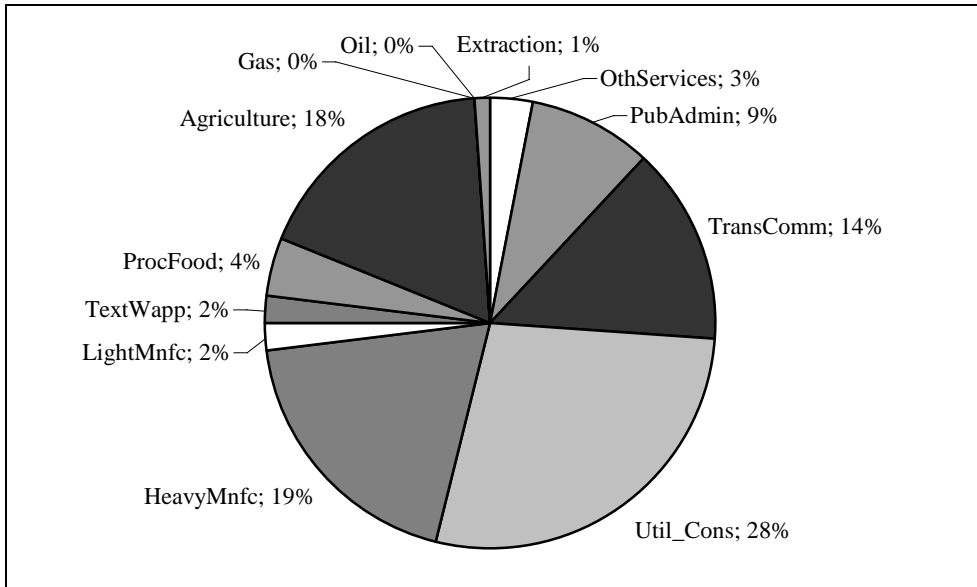
The rest of the study is organized as follows: Section 12.2 offers a general background to the production and trade of Kyrgyzstan. Section 12.3 discusses the results. Concluding comments can be found in Section 12.4.

### **12.2. Trade and Production structure of Kyrgyzstan**

The importance of different sectors in Kyrgyzstan’s output is depicted in Figure 12.2.1. Services represent a bit less important share of output in Kyrgyzstan than in some other CIS countries. The share of services output is about half of the total output in the economy. Among manufacturing sectors, heavy manufacturing sectors take up the most important part of total output, representing about 19%. On the other hand output in light manufacturing sectors is rather small and it is around 2% of total output. Agricultural output is relatively high (about 18% of total output)

much higher than in some other CIS countries, such as Ukraine, Kazakhstan or Russia where it represents 8-9% of total output. Processed food contributes to 4% of total output.

**Figure 12.2.1. Share of sectors in Kyrgyzstan's output in 2004**

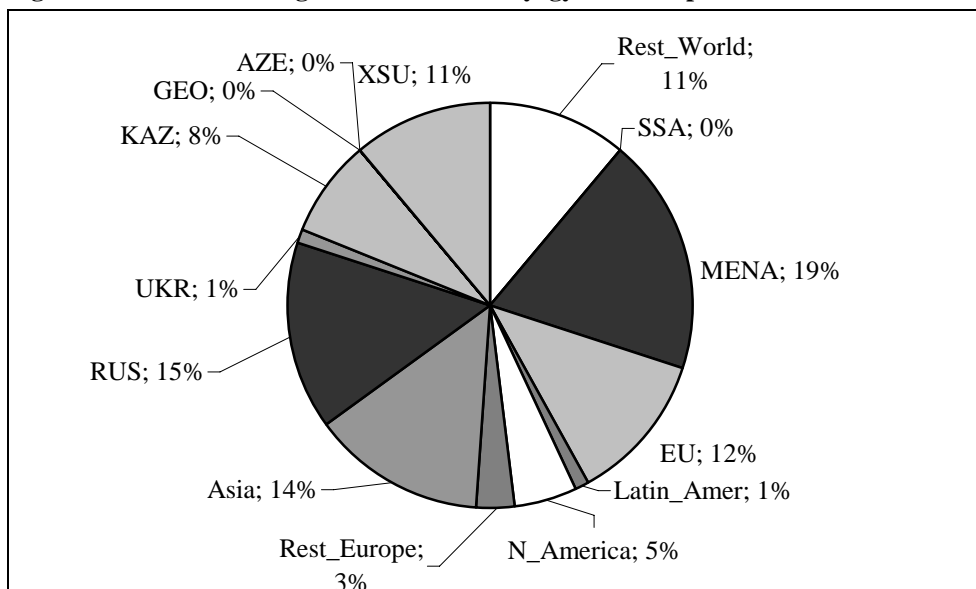


Source: own calculations, data come from GTAP database version 7.

Figure 12.2.2 depicts the importance of different regions and countries in Kyrgyzstan's exports. Unlike for Russia, Ukraine and some other CIS countries, for Kyrgyzstan the EU is not the most important export destination, only 12% of total exports go to the EU. Most of Kyrgyzstan's exports go to other countries within the CIS. Russia is Kyrgyzstan's most important trading partner followed by Kazakhstan and other countries in the CIS. About 19% of all Kyrgyzstan's exports go to countries in the MENA region. Moreover, an important part of exports, about 14% go to Asian countries in Asia (outside the CIS).

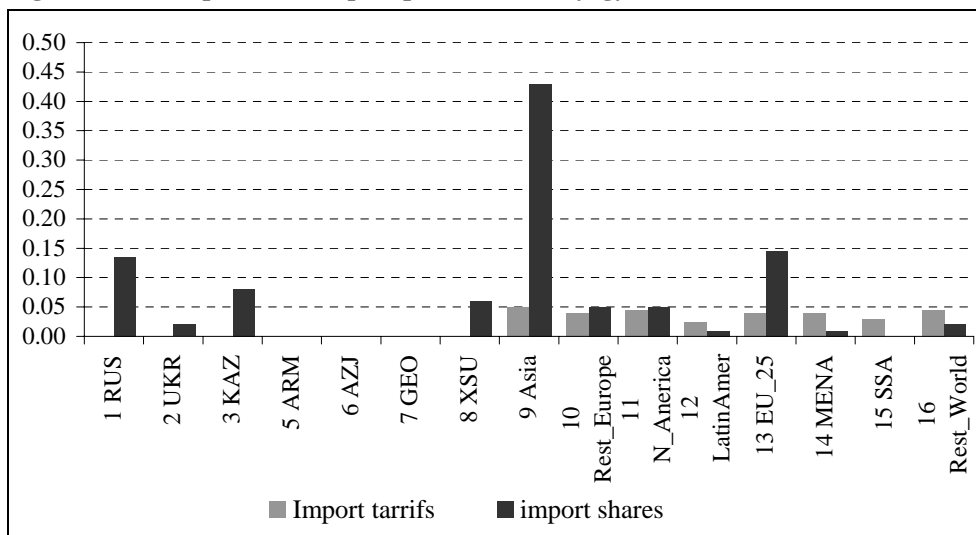
Figure 12.2.3 depicts Kyrgyzstan imports coming from different destinations and the corresponding import tariffs. Similarly to exports, unlike some other bigger countries in the CIS region Kyrgyzstan's imports from the EU are relatively small representing a bit less than 15% of total. There are no import tariffs for other countries in the CIS region; nevertheless the share of imports coming from these countries is rather small with the exception of Russia from where about 12% of imports are coming and Kazakhstan which supplies about 8% of total imports. The most important import source are the countries outside the EU and CIS, mostly Asian countries outside the CIS (more than 40% of total).

Figure 12.2.2. Share of regions/countries in Kyrgyzstan's exports in 2004



Source: own calculations, data come from GTAP database version 7.

Figure 12.2.3. Imports and import protection in Kyrgyzstan in 2004

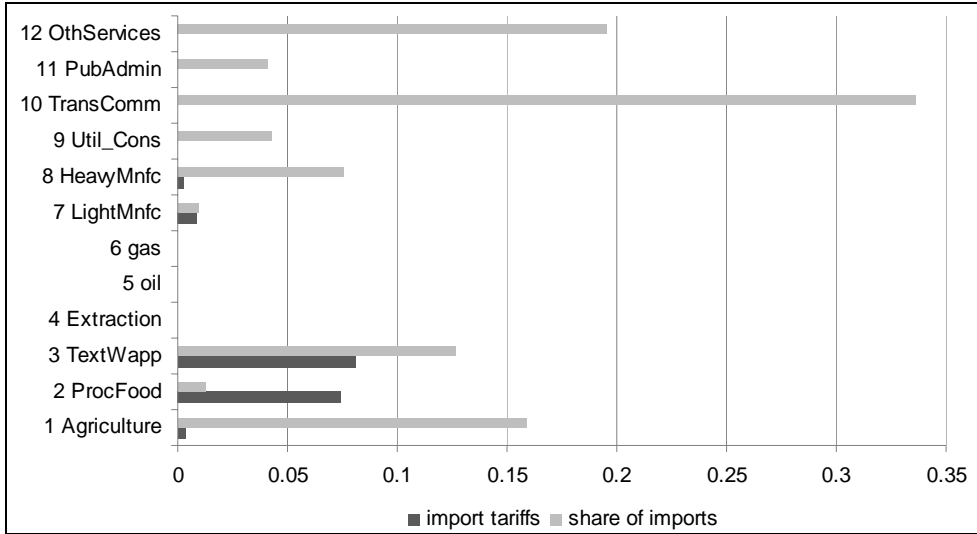


Source: own calculations, data come from GTAP database version 7

Figure 12.2.4 shows EU import tariffs and import in different sectors originating from Kyrgyzstan. The highest import tariffs are in the processed food sector and in textiles and clothing. The share of imports in processed food sectors is

rather small; imports in these sectors are around 1% while in textiles and apparel it is much higher amounting to about 13% of total imports. The sector with the highest share of imports apart from imports in services is the agricultural sector which represents a bit more than 15% of total imports from Kyrgyzstan.

**Figure 12.2.4. EU imports from Kyrgyzstan and import tariffs in 2004**



Source: own calculations, data come from GTAP database version 7.

## 12.3. Results

### 12.3.1. Real Income Effects

Trade liberalization would have a positive income effect for Kyrgyzstan under all three scenarios which are shown in Table 12.3.1. The smallest effect would occur under the first FTA scenario which would result in a 0.42% real income increase which is much higher than the effects in the EU or in the CIS on average. The second FTA scenario which would involve liberalization in agriculture and processed food sectors as well would have a slightly higher real income effect than the first scenario. The third, full FTA scenario would have the highest positive real income effect with a 1.04% real income increase which is much higher than the effects on EU's or CIS's real income effects.

**Table 12.3.1. Real Income Effects (percentage change from baseline)**

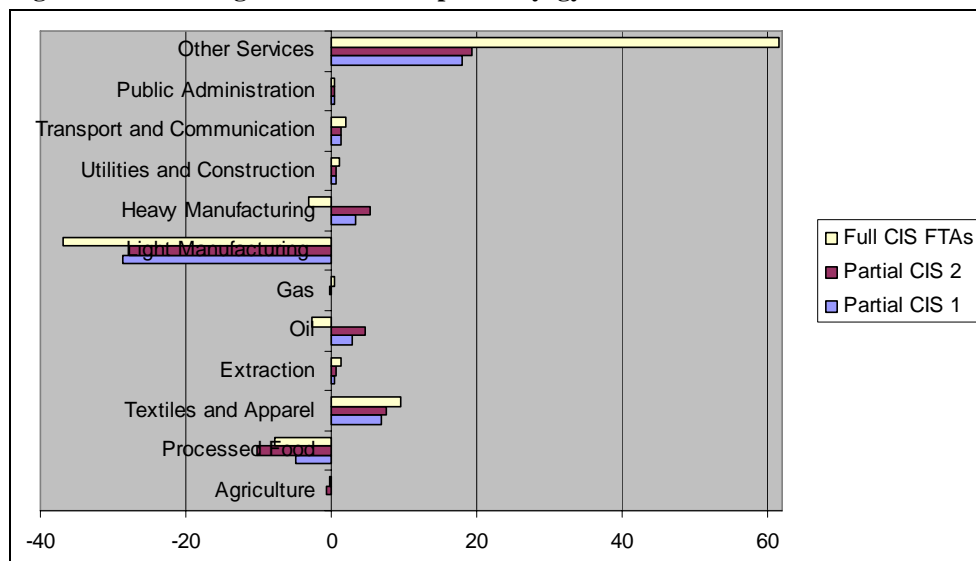
Scenario	Partial 1 trade agreement	Partial 2 trade agreement	Full FTA
EU	0.14	0.13	0.21
CIS	-0.53	-0.83	0.62
Kyrgyzstan	0.42	0.49	1.04

Source: Model simulations.

### 12.3.2. Changes in sectoral output in Kyrgyzstan

Our analysis shows the important changes in the sectoral output of Kyrgyzstan as a result of different forms of trade liberalisation. Figure 12.3.1 depicts changes in the output of different sectors in Kyrgyzstan after the three different FTA would take place.

**Figure 12.3.1. Changes in sectoral output of Kyrgyzstan**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The most pronounced decrease would take place in the light manufacturing sectors. This sector would experience a decrease in output which would be a bit less than 30% in case of the first two scenarios and would be somewhat higher, around 37% under the full FTA scenario. Apart from light manufacturing sectors, processed food products would also experience a drop in their output which would



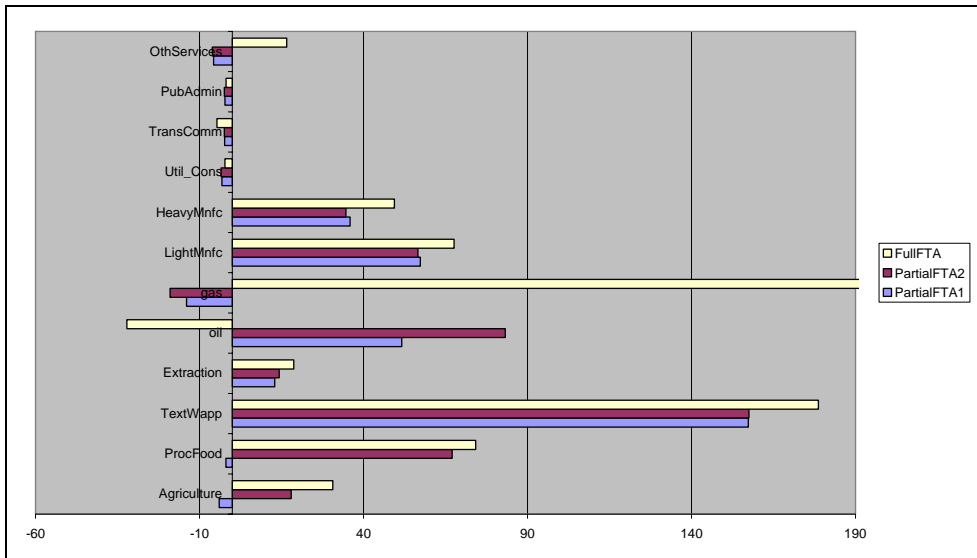
be the highest under the second FTA with a magnitude of 10% and somewhat lower under the two other FTA scenarios.

Most other sectors would have a small increase in the production under the different scenarios. Sectors belonging to other services would experience an important increase in their output (20%) under the first two scenarios and a 60% increase under the third type of FTA which would incorporate liberalization in services. Apart from services, textiles and apparel, oil and heavy manufacturing sectors would experience an increase in output.

### 12.3.3. Effects on bilateral trade flows

In this section we provide detailed results on trade impacts in the three scenarios, and we present the changes in trade flows by sector.

**Figure 12.3.2. Changes in EU exports to Kyrgyzstan by sector**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The Figure 12.3.2 depicts changes in EU exports towards Kyrgyzstan as result of three different FTA scenarios. The services sectors experience a small reduction in the first two scenarios. Under the third scenario, trade in services sectors belonging to ‘other services’ is liberalised. As a consequence there would be a 16% increase in EU exports in other services towards Kyrgyzstan. An important in-

crease would occur in exports of textiles and apparel under all scenarios, the biggest increase occurring under the third scenario (by 157-179% depending in the scenario). Light manufacturing exports would also increase about 56-67% depending on the scenario. When trade liberalisation would involve agriculture and processed food sectors, these sectors would also experience an important increase in their exports towards Kyrgyzstan. There would be an increase in oil and gas exports, which according to the graph is important in terms of percentage change compared to the baseline scenario. The table below shows the percentage changes compared to the baseline together with the share of exports in each sector. The share of gas and oil sector's exports is very close to zero, thus the increase shown in the graph in the exports of gas in terms of level is minimal.

**Table 12.3.2. Percentage changes in sectoral exports of the EU**

	<b>Partial FTA 1</b>	<b>Partial FTA 2</b>	<b>Full FTA</b>	<b>Share in total exports</b>
Agriculture	-4.02	17.95	30.59	0.85%
Processed Food	-2.00	67.01	74.17	5.84%
Textiles and Apparel	157.33	157.55	178.71	1.76%
Extraction	12.90	14.31	18.69	0.02%
Oil	51.67	83.22	-32.18	0.00%
Gas	-13.96	-18.98	250.53	0.00%
Light Manufacturing	57.34	56.61	67.62	27.20%
Heavy Manufacturing	35.92	34.61	49.40	28.20%
Utilities and Construction	-3.21	-3.43	-2.26	0.88%
Transport and Communication	-2.36	-2.42	-4.71	10.26%
Public Administration	-2.26	-2.41	-1.90	1.42%
Other Services	-5.72	-6.11	16.61	23.60%

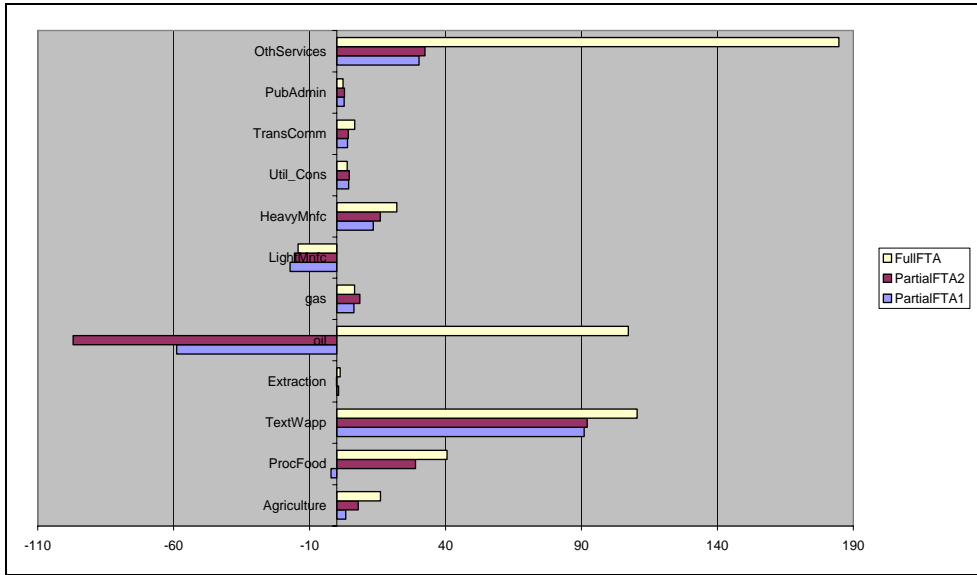
Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Figure 12.3.3 shows percentage changes in exports of Kyrgyzstan by each sector towards the EU. Similarly to the case of EU, an important increase would occur in other services exports if trade would be liberalised between the EU and the CIS in these sectors.

While there would be an important reduction amounting to 59% under the first scenario and 97% under the second scenario in exports of oil, under the third, full FTA scenario an increase of more than 100% would take place. Apart from decrease in exports of oil, light manufacturing exports would also decline under all the three scenarios by 15-17%. In all other sectors there would be increases in exports from Kyrgyzstan toward the EU. The most pronounced increase would occur in other services and in the textiles and apparel sectors. Under the first and second scenarios, the increase would be around 90% for textiles and clothing, and around

30% for other services. The increase in exports would be much higher under the third scenario in services amounting to 185%. Exports in heavy manufacturing would increase by 13-16% under the two first scenarios and by 22% in case of full liberalisation. Increase in exports of processed food and agricultural products would take place under almost all three scenarios, the effect being small in case of no liberalisation in agriculture and becoming higher once liberalisation in the agriculture and food sectors would also take place.

**Figure 12.3.3. Changes in Kyrgyz exports to the EU by sector**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

**Table 12.3.3. Percentage changes in sectoral exports of Kyrgyzstan**

	Partial FTA 1	Partial FTA 2	Full FTA	Share in total exports
Agriculture	3.28	7.91	16.09	14.94%
Processed Food	-2.12	28.92	40.54	1.17%
Textiles and Apparel	90.98	92.14	110.45	13.61%
Extraction	0.67	-0.11	1.25	0.03%
Oil	-58.92	-96.97	107.22	0.00%
Gas	6.30	8.50	6.54	0.00%
Light Manufacturing	-17.16	-15.58	-14.23	0.86%
Heavy Manufacturing	13.42	16.02	22.04	6.99%
Utilities and Construction	4.35	4.64	3.84	4.34%
Transport and Communication	3.92	4.21	6.63	34.09%
Public Administration	2.70	2.83	2.25	4.17%
Other Services	30.26	32.43	184.69	19.79%

Table 12.3.4 shows the percentage changes in sectoral exports together with the share of each sector in total exports towards the EU in the baseline. Although the most important decrease would occur in exports of oil under the second scenario (by almost 100%), this sector represents only a very small share in total exports.

### 12.3.4. Other Macroeconomic Results

In this section other macroeconomic results, such as changes in wages and GDP are discussed. They are summarized in Table 12.3.4 and Table 12.3.5 below. Kyrgyzstan would have an increase of 1.87% in its GDP under the full FTA scenario which is shown in Table 12.3.4. This increase is somewhat higher than the average increase in the CIS.

Kyrgyzstan would experience an increase in wages for both the skilled and unskilled workers. These increases would be higher than those reported for the CIS average for wages of skilled workers where 3.6% increase would occur. The increase in Kyrgyzstan's wages for unskilled workers would be around 1.58%.

**Table 12.3.4. Macroeconomic results from Full FTA (in %)**

	EU	CIS	Kyrgyzstan
Change in GDP	0.18	1.195	1.87
Unskilled worker wage	0.26	1.56	1.58
Skilled worker wage	0.24	1.47	3.6

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Other macroeconomic variables of the more realistic scenarios of trade agreements are summarized in Table 12.3.5 below. These results are different in magnitude and represent smaller increases than the full FTA scenario. The first scenario would result in a 1% increase in GDP while the second scenario would have a slightly higher positive effect.

**Table 12.3.5. Macroeconomic results from Partial 1 & 2 trade agreement**

	Partial 1 trade agreement			Partial 2 trade agreement		
	EU	CIS	Kyrgyzstan	EU	CIS	Kyrgyzstan
Change in GDP	0.12	-0.13	1.02	0.10	-0.35	1.21
Unskilled worker wage	0.18	0.22	0.94	0.18	0.16	0.94
Skilled worker wage	0.16	0.32	1.49	0.15	0.36	1.77

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Both skilled and unskilled workers in Kyrgyzstan would experience an increase in their wages similarly to the full FTA scenario although the effects would be much lower. The changes in wages in Kyrgyzstan would be higher than those experienced by workers in the CIS or in the EU on average. The increase in wages in Kyrgyzstan would be higher for skilled workers and lower for unskilled workers under the first two FTA scenarios.

### 12.3.5. Terms of Trade Effects

The table below shows terms of trade effects in the case of a full free trade agreement with liberalization not being limited to only agriculture and manufacturing products but also services trade and technical barriers. While the EU would have small terms of trade improvement amounting to about 0.11%, the CIS on average would experience 0.83% deterioration and the terms of trade deterioration would amount to 1.05% in the case of Kyrgyzstan.

**Table 12.3.6. Terms of trade results from Full FTA (in %)**

	EU	CIS	Kyrgyzstan
Terms of trade effects	0.11	-0.83	-1.05

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The terms of trade effects for the two other forms of trade liberalisation are presented in the table below. Kyrgyzstan again, similarly to the full FTA case would experience a terms of trade deterioration however it would be lower under the first two FTAs than under full FTA liberalization. The decrease in terms of trade would be similar in magnitude under the first and second to the CIS average terms of trade changes. On the other hand the terms of trade gains for the EU would be significantly much smaller than for Kyrgyzstan and always positive.

**Table 12.3.7. Terms of trade results from Partial 1 & 2 trade agreement**

	Partial 1 trade agreement			Partial 2 trade agreement		
	EU	CIS	Kyrgyzstan	EU	CIS	Kyrgyzstan
Terms of trade effects	0.09	-0.63	-0.62	0.10	-0.76	-0.78

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

## **12.4. Conclusions**

In this study we explore the economic effects of potential measures to liberalize trade between the European Union and Kyrgyzstan. In so doing, we have a Computable General Equilibrium Model, CGE Model, based on the most recent version of the GTAP data base, i.e. GTAP 7, which is benchmarked to data from 2004. Our CGE model follows recent research in trade theory in taking differences in underlying industry specific market structures and elasticities into account. Furthermore, the model incorporates estimated non-tariff trade barriers to trade in services, stemming from industry-specific gravity equation, which enhances the analysis of the service sector. The results are compared to a baseline which incorporates recent developments in the trade policy environment, i.e. the phase out of ATC, enlargement of the EU and CIS accessions to the WTO. The analysis takes agricultural liberalization, liberalization in industrial tariffs, and liberalization in services trade as well as trade facilitation measures into account.

Only a rather limited income effect would occur in the EU as a consequence of the FTAs while the income effect in Kyrgyzstan would be higher in magnitude. While Kyrgyzstan would experience positive income effects under all different FTA scenarios, the effects under the first two scenarios would be rather small. Nevertheless, under the full FTA scenario a considerable positive real income effect would take place in Kyrgyzstan.

The change in GDP under all different scenarios would be positive for Kyrgyzstan while being the highest under the third FTA scenario which incorporates not only elimination of tariffs on goods but also liberalisation of trade in services and reductions in technical barriers to trade.

## **13. Country Study: Russia**

### **13.1. Introduction**

Russia is the EU's third trading partner, after the USA and China. Moreover, the EU's trade with Russia has been growing rapidly, for example in 2006 it increased by 25.7%. On the other hand, the EU is Russia's main trading partner, accounting for more than 54% of its overall trade. EU's exports to Russia are more diversified while imports from Russia are mainly concentrated on energy and mineral fuels.

The Partnership and Co-operation Agreement (PCA) which entered into force in 1997 has been the framework of the EU-Russia relationship for a decade. The agreement regulates the political, economic and cultural relations between the EU and Russia and is the legal basis for the EU's bilateral trade with Russia. In 2003 the EU and Russia agreed to create four EU-Russia "common spaces", within the framework of the existing Partnership and Co-operation Agreement (PCA). The Common Economic Space (CES) aims at increasing economic cooperation with creating grounds for establishing a more open and integrated market between the EU and Russia.

After the Russian WTO accession takes place the EU is planning to negotiate with Russia a comprehensive economic integration agreement. The potential new agreement would aim at reducing trade barriers between the EU and Russia including also various non-tariff barriers.

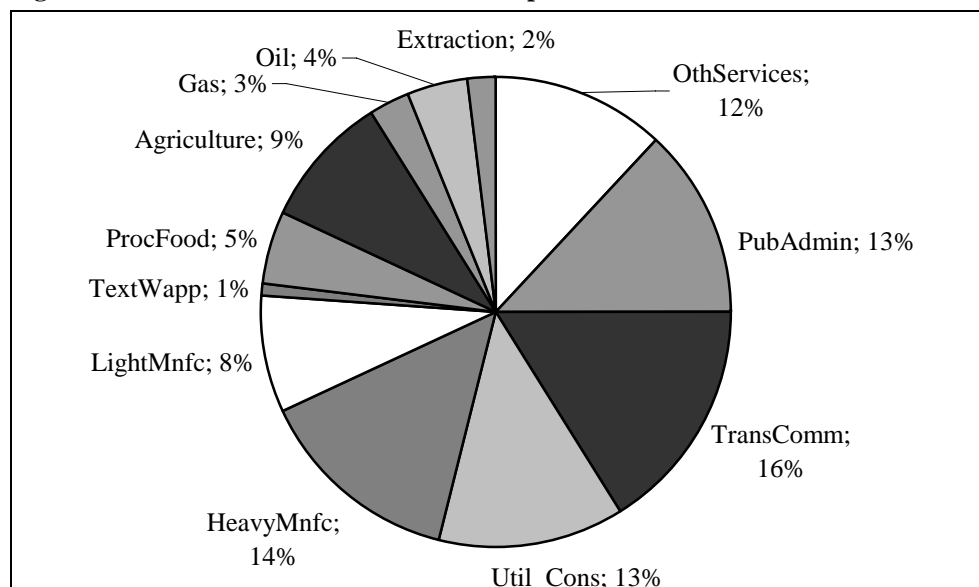
The rest of the study is organized as follows: Section 13.2 offers a general background to the production and trade of Russia. Section 13.3 discusses the results. Concluding comments can be found in Section 13.4.

### **13.2. Trade and Production structure of Russia**

Services represent about 54% of total output in Russia. Oil, gas, and other mineral extractions all together represent about 9% of total output on average in Rus-

sia which is depicted in Figure 13.2.1<sup>7</sup>. Heavy manufacturing (which includes petroleum, coal products, chemical, rubber, plastic prods, mineral products, ferrous metals, metals, electronic equipment, machinery and equipment, and manufactures nec) contributes to 14% of output. Output in light manufacturing sectors is only about half of the output share of the heavy manufacturing sectors representing only 8% of total output. The agricultural output together with output in the processed food sector represents about 14% of total output.

**Figure 13.2.1. Share of sectors in Russia's output in 2004**



Source: own calculations, data come from GTAP database version 7.

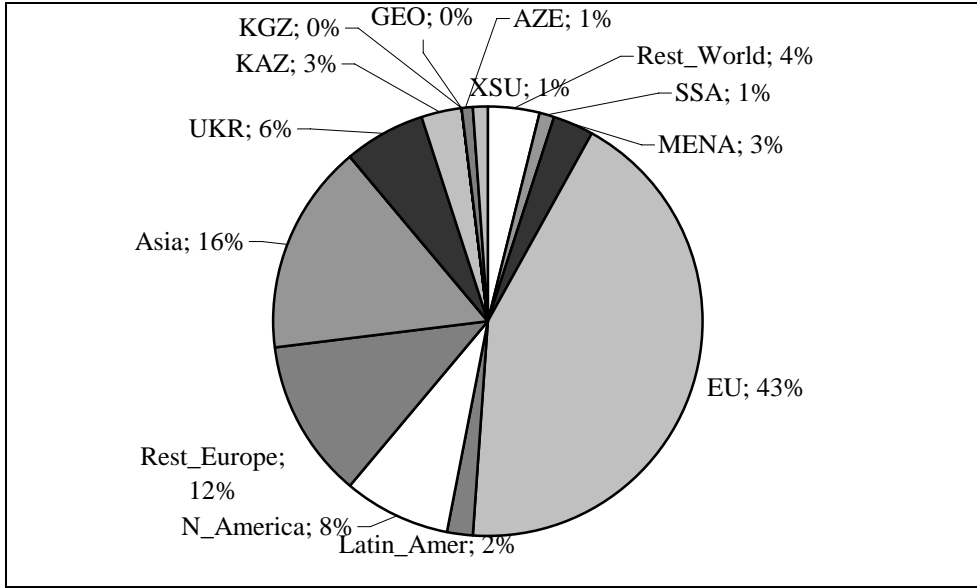
Figure 13.2.2 depicts the importance of different regions and countries in Russia's exports. The EU is the most important export destination for Russia. About 43% of all Russian exports are directed to the EU. The second biggest export destination is also outside the CIS region, about 16% of exports go to Asia. Furthermore, an important part of Russian exports, 12% go to rest of European countries outside the CIS and the EU-25. Relatively little exports go to North America (only about 8% of total exports). Within the CIS region Ukraine is the most important export destination with 6% of total Russian exports going to

<sup>7</sup> Probably part of oil and gas output is recorded in service sector due to transfer prices. According to various estimates, the share of energy sector in Russia's GDP varies from 10% to 30% (most frequently in the range of 20-25%).



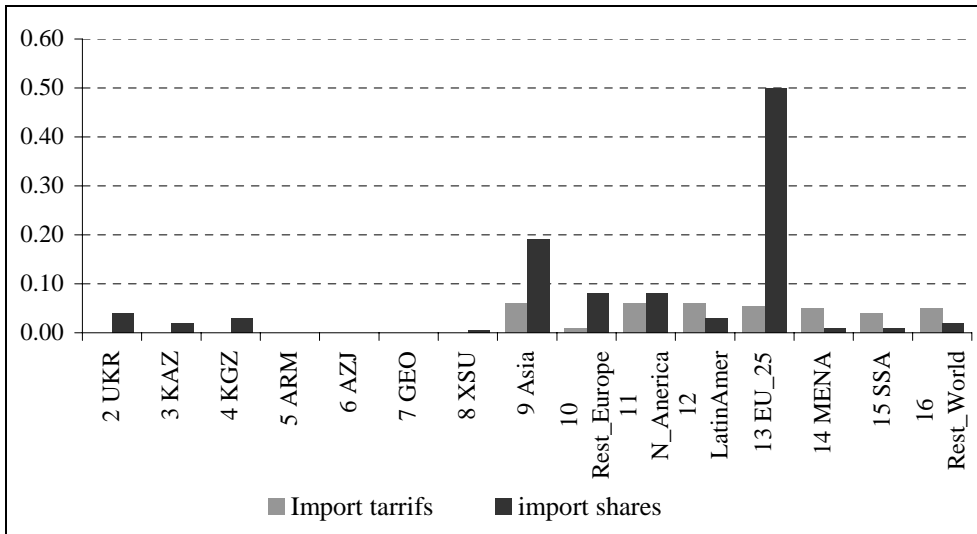
Ukraine. The other countries in the region absorb a rather small share of Russian exports compared to other countries.

**Figure 13.2.2. Share of regions in Russia's exports in 2004**



Source: own calculations, data come from GTAP database version 7.

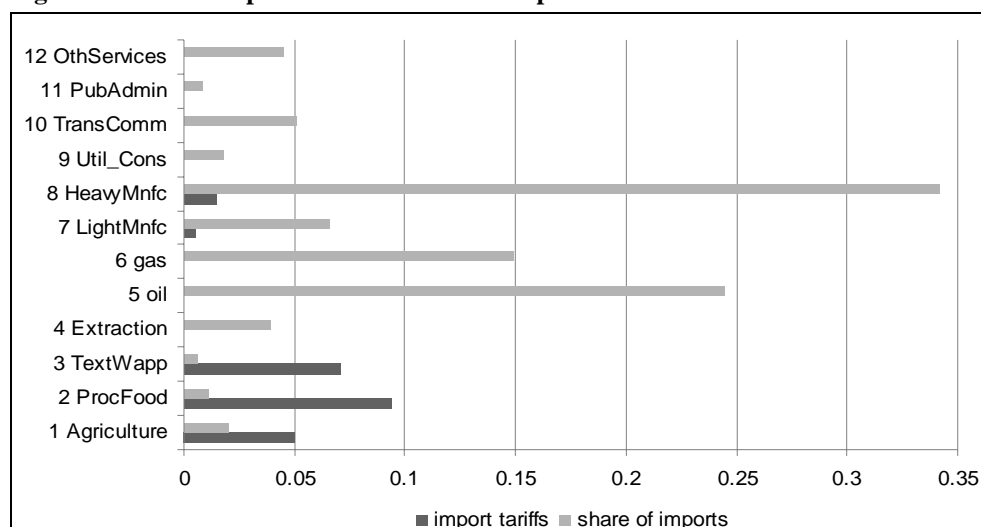
**Figure 13.2.3. Russia: Imports and import protection in 2004**



Source: own calculations, data come from GTAP database version 7.

Figure 13.2.3 depicts Russian imports coming from different destinations together with the applicable import tariffs. Similarly to exports, the EU is the most important import partner with imports coming from the EU representing about half of total Russian imports. Average import tariffs on EU imports are around 6% which is about the same as the average tariff for other third regions. There are no import tariffs for other countries in the CIS region; nevertheless the share of imports coming from these countries is rather small. About 5% of imports are coming from Ukraine and about 2.5% from Kazakhstan, imports from other CIS countries are smaller than 1%.

**Figure 13.2.4. EU imports from Russia and import tariffs in 2004**



Source: own calculations, data come from GTAP database version 7.

Figure 13.2.4 shows EU import tariffs and import in different sectors originating from Russia. The highest import tariffs are in the processed food sector, in agricultural products and in textiles and clothing. The share of imports in these sectors for Russia is relatively small. The sector with the highest share of imports is heavy manufacturing which represents about one-third of total imports. Although there are some import tariffs applicable to imports in these sectors these are very small, smaller than 1%. Imports of gas and oil are very significant, together representing almost half of total imports. Import tariffs in these sectors are zero.

These figures suggest that if the FTA between the EU and Russia would be limited only to reduction of tariffs in goods the benefits for Russia with the current trade structure are likely to be very limited or even negative.

### 13.3. Results

#### 13.3.1. Real Income Effects

Trade liberalization would have a negative income effect for Russia under all the different scenarios which is shown in Table 13.3.1. The smallest loss would occur under the full FTA scenario which would result in a 0.4% real income decrease. On the other hand the biggest decrease would occur in case of the second scenario amounting to a 1.33% real income decrease. These negative effects under the first two scenarios are mainly due to the important negative terms of trade effects taking place in Russia. Compared to the real income effects of Russia, the average effects in the CIS countries would be less negative and would result in an improvement under the third scenario. On the other a small positive net income effects would occur in the EU. The gains from liberalization for the EU would be the highest under the full FTA scenario and very similar in magnitude under the first two scenarios

**Table 13.3.1. Real Income Effects (percentage change from baseline)**

Scenario	Partial 1 trade agreement	Partial 2 trade agreement	Full FTA
EU	0.14	0.13	0.21
CIS	-0.53	-0.83	0.62
Russia	-1.09	-1.33	-0.40

Source: Model simulations.

#### 13.3.2. Changes in sectoral output in Russia

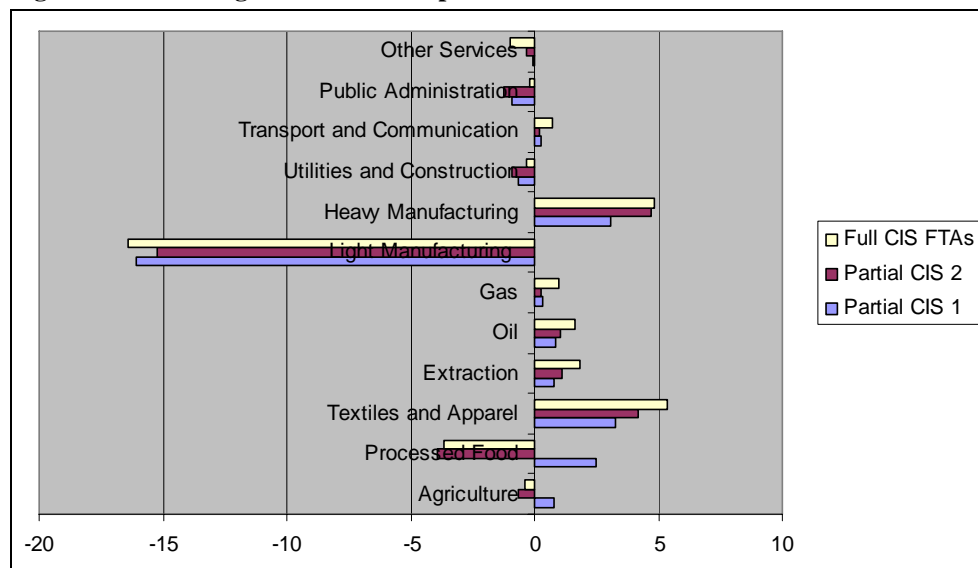
Our analyses of the expected changes in sectoral output as a result of different forms of trade liberalisation show that important changes would occur in the sectoral output of Russia. Figure 13.3.1 depicts changes in the output of different sectors in Russia after the three different FTA would take place.

The most pronounced decrease would take place in the light manufacturing sectors with the drop in the production being very similar under all the three scenarios. The decrease of production in average would be around 16%. There are several other sectors where smaller reduction in output would occur under the different scenarios. The sector which would experience the second most important drop in sectoral output is processed food sector. This sector would have a 4% reduction in output under the second and third FTAs which involve liberalization of

trade in agriculture and processed food sector. However, there would be an increase in the sectoral output under the first FTA which would not involve any liberalization of trade in this sector.

The sectors where increases in sectoral output would take place are the heavy manufacturing sectors and textiles and apparel. For both sectors the biggest increase would occur in case of full FTAs amounting to about 5% increase in their output.

**Figure 13.3.1. Changes in sectoral output of Russia**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

### 13.3.3. Effects on bilateral trade flows

In this section we provide detailed results on trade impacts in the three scenarios, and we present the changes in trade flows by sector.

The Figure 13.3.2 depicts changes in EU exports towards Russia after the three different FTA scenarios. The services sectors experience a small reduction in the first two scenarios. Under the third scenario, trade in services sectors belonging to ‘other services’ is liberalised. As a consequence of this there would be an important, about 42% increase in EU exports in other services sectors towards Russia. An important increase would occur in exports of textiles and apparel under all scenarios, the biggest increase occurring under the third scenario. The exports in

these sectors would more than double towards Russia. Light manufacturing exports would also increase about 94-103% depending on the scenarios. When trade liberalisation would occur also in agriculture and processed food sectors, these sectors would also experience an important increase in their exports towards Russia. There would be an increase in gas exports, which according to the graph is important in terms of percentage change compared to the baseline scenario. The table below shows the percentage changes compared to the baseline together with the share of exports in each sector. The share of gas and oil sector's exports is very close to zero, thus the increase shown in the graph in the exports of gas to Russia in terms of level is minimal.

**Table 13.3.2. Percentage changes in EU sectoral exports to Russia**

	<b>Partial CIS 1</b>	<b>Partial CIS 2</b>	<b>Full CIS FTAs</b>	<b>Share in total exports</b>
Agriculture	-13.94	59.09	71.31	3.46%
Processed Food	-13.44	64.36	71.43	5.74%
Textiles and Apparel	101.46	100.75	112.33	4.17%
Extraction	7.73	8.90	15.08	0.22%
Oil	4.36	7.74	49.07	0.00%
Gas	-5.50	-5.55	248.14	0.00%
Light Manufacturing	94.34	91.17	102.58	18.83%
Heavy Manufacturing	37.17	35.57	45.27	45.65%
Utilities and Construction	-10.78	-12.05	-11.22	3.37%
Transport and Communication	-8.78	-9.84	-9.95	7.24%
Public Administration	-10.4	-11.53	-11.78	1.29%
Other Services	-7.39	-8.10	42.56	10.03%

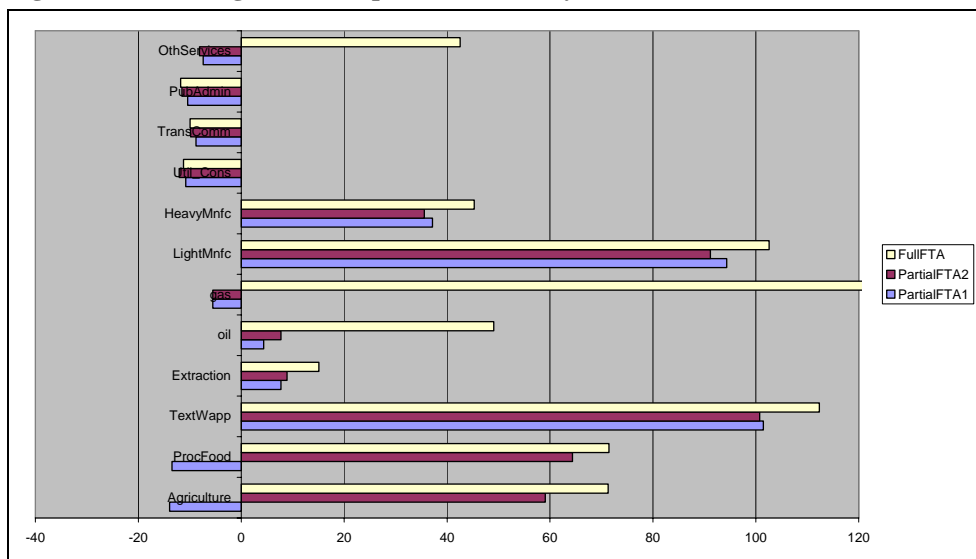
Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Figure 13.3.3 shows percentage changes in exports of Russia by each sector towards the EU. Similarly to the case of EU exports in services, an important increase would occur in other services exports if trade would be liberalised between the EU and the CIS in these sectors.

While there would be a few percentage points reduction in exports of oil under the second FTA scenario, in all other cases there would be increases in exports from Russia toward the EU. The most pronounced increase would occur in the textiles and apparel sectors. Under the first and second scenarios, the increase would be around 120% and would be around 145% in case of full liberalisation. Exports in heavy manufacturing would increase by 35-38% under the two first scenarios and by 54% in case of full liberalisation. Increase in exports of processed food and agricultural products would take place under all three scenarios,

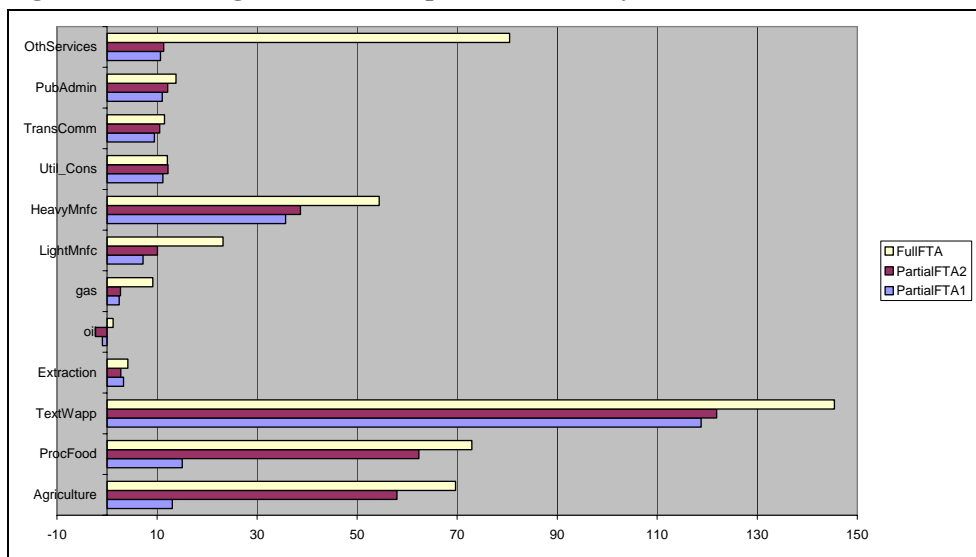
the effect being small in case of no liberalisation in agriculture and becoming important once liberalisation in the agriculture and food sectors would also take place.

**Figure 13.3.2. Changes in EU exports to Russia by sector**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

**Figure 13.3.3. Changes in Russian exports to the EU by sector**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Table 13.3.3 shows the percentage changes in sectoral exports together with the share of each sector in total exports towards the EU in the baseline. Although the most important increase would occur in the textiles and apparel sector with exports to the EU increasing by 120-145% depending on the scenario, this sector represents only a small share of exports in total exports (less than 1%). In the exports of goods the second most important increase would occur in processed food followed by the increase in exports of agricultural products. Again, these sectors represent only a very small share of total exports therefore the change after the different FTAs in level would be only very small.

**Table 13.3.3. Percentage changes in sectoral exports of Russia**

	Partial FTA 1	Partial FTA 2	Full FTA	Share in total exports
Agriculture	13.03	57.98	69.67	2.01%
Processed Food	15.04	62.35	72.94	1.11%
Textiles and Apparel	118.79	121.88	145.43	0.81%
Extraction	3.29	2.77	4.17	3.68%
Oil	-0.93	-2.32	1.21	22.63%
Gas	2.42	2.69	9.15	14.64%
Light Manufacturing	7.19	10.08	23.17	6.57%
Heavy Manufacturing	35.71	38.69	54.43	35.77%
Utilities and Construction	11.19	12.19	12.07	1.77%
Transport and Communication	9.45	10.53	11.51	5.21%
Public Administration	11.06	12.11	13.78	0.86%
Other Services	10.69	11.33	80.48	4.92%

### 13.3.4. Other Macroeconomic Results

In this section other macroeconomic results, such as changes in wages and GDP are discussed. These results are summarized in Table 13.3.4 and Table 13.3.5 below. Although the change in GDP indicates a slightly bigger gain for the CIS on average than for the EU in case of full FTA, Russia would have a decrease in its GDP under all scenarios. This decrease would be the smallest in the case of full FTA, amounting to a 0.05% decrease, and the highest in case of the second scenario with a 0.9% decrease. The resulting changes are shown in Table 13.3.4 below for the full FTA scenario.

Russia would experience an increase in wages for both the skilled and unskilled workers. These increases would be much smaller than those reported for the average of CIS. The increase in Russian wages would be around 0.25% for unskilled workers, and about 0.62% for skilled workers.

**Table 13.3.4. Macroeconomic results from Full FTA (in %)**

	<b>EU</b>	<b>CIS</b>	<b>Russia</b>
Change in GDP	0.18	1.195	-0.05
Unskilled worker wage	0.26	1.560	0.25
Skilled worker wage	0.24	1.470	0.62

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The results with regards to the effect on other macroeconomic variables of the more realistic scenarios of trade agreements are summarized in Table 4.5 below. These results are different not only in magnitudes but also the sign of the change is reversed for the wages for Russia. While the full FTA would result in an increase in wages, the first two scenarios with lower level of trade liberalisation would imply a reduction in wages in Russia. Both skilled and unskilled workers in Russia would experience a drop in their wage unlike the workers in the EU or average workers in the CIS. The decrease in wages in Russia would be the highest under the first scenario in which case both unskilled and skilled workers would experience a close to half percent reduction in wages. Furthermore, the reduction in GDP would be more pronounced under the first two scenarios being the highest, around 0.91 under the second scenario.

**Table 13.3.5. Macroeconomic results from Partial 1 & 2 trade agreement**

	<b>Partial 1 trade agreement</b>			<b>Partial 2 trade agreement</b>		
	<b>EU</b>	<b>CIS</b>	<b>Russia</b>	<b>EU</b>	<b>CIS</b>	<b>Russia</b>
Change in GDP	0.12	-0.13	-0.71	0.10	-0.35	-0.91
Unskilled worker wage	0.18	0.22	-0.47	0.18	0.16	-0.39
Skilled worker wage	0.16	0.32	-0.42	0.15	0.36	-0.22

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

### **13.3.5. Terms of Trade Effects**

The table below shows terms of trade effects in the case of full free trade agreement with liberalization in not only agriculture and manufacturing products but also services trade and reduction in technical barriers. While the EU would have small terms of trade improvement amounting to about 0.11%, the CIS on average would experience 0.83% deterioration and the terms of trade deterioration would amount to 1.63% in the case of Russia.

The terms of trade effects for the two other forms of trade liberalisation are presented in the table below. Russia again, similarly to the full FTA case would



experience a terms of trade deterioration. This decrease in terms of trade would be very similar in magnitude under the first scenario and the full FTA while being slightly higher under the second FTA scenario. On the other hand the terms of trade gains for the EU would be significantly much smaller than for Russia and always positive.

**Table 13.3.6. Terms of trade results from Full FTA (in %)**

	<b>EU</b>	<b>CIS</b>	<b>Russia</b>
Terms of trade effects	0.11	-0.83	-1.63

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

**Table 13.3.7. Terms of trade results from Partial 1 & 2 trade agreement**

	<b>Partial 1 trade agreement</b>			<b>Partial 2 trade agreement</b>		
	<b>EU</b>	<b>CIS</b>	<b>Russia</b>	<b>EU</b>	<b>CIS</b>	<b>Russia</b>
Terms of trade effects	0.09	-0.63	-1.62	0.10	-0.76	-1.83

Source: Model simulations. Note: All results are reported as percentage change compared to baseline

## 13.4. Conclusions

In this study we explore the economic effects of potential measures to liberalize trade between the European Union and Russia. In so doing, we have a Computable General Equilibrium Model, CGE Model, based on the most recent version of the GTAP data base, i.e. GTAP 7, which is benchmarked to data from 2004. Our CGE model follows recent research in trade theory in taking differences in underlying industry specific market structures and elasticities into account. Furthermore, the model incorporates estimated non-tariff trade barriers to trade in services, stemming from industry-specific gravity equation, which enhances the analysis of the service sector. The results are compared to a baseline which incorporates recent developments in the trade policy environment, i.e. the phase out of ATC, enlargement of the EU and CIS accessions to the WTO. The analysis takes agricultural liberalization, liberalization in industrial tariffs, and liberalization in services trade as well as trade facilitation measures into account.

The EU is a very important trading partner for Russia. On the other hand, Russia is also an important trading partner for the EU but to a much smaller extent. Furthermore, CIS as a region represents only a relatively small share of EU trade. As a consequence of this asymmetric relationship the effects of an FTA between the EU and the CIS would have asymmetric effects on the EU and Russia. The

impact of an FTA would be more pronounced for Russia and rather marginal for the EU.

Only a rather limited income effect would occur in the EU as a consequence of the FTAs while the income effect in Russia would be higher in magnitude. While Russia would experience a negative income effect under all different FTA scenarios the effect for the EU would be small but positive.

The change in GDP in the two regions reflects similar developments. A reduction in GDP would take place under the different FTA scenarios in Russia with this reduction being the highest under the second FTA scenario and close to zero but negative under the full FTA scenario. These negative effects are mainly due to the important negative terms of trade effects taking place in Russia.

# 14. Country Study: Ukraine

## 14.1. Introduction

With the EU enlargement, the EU became the main trading partner of Ukraine, replacing Russia as Ukraine's foremost commercial partner. Ukraine's trade with the EU accounts for about one third of its external trade.

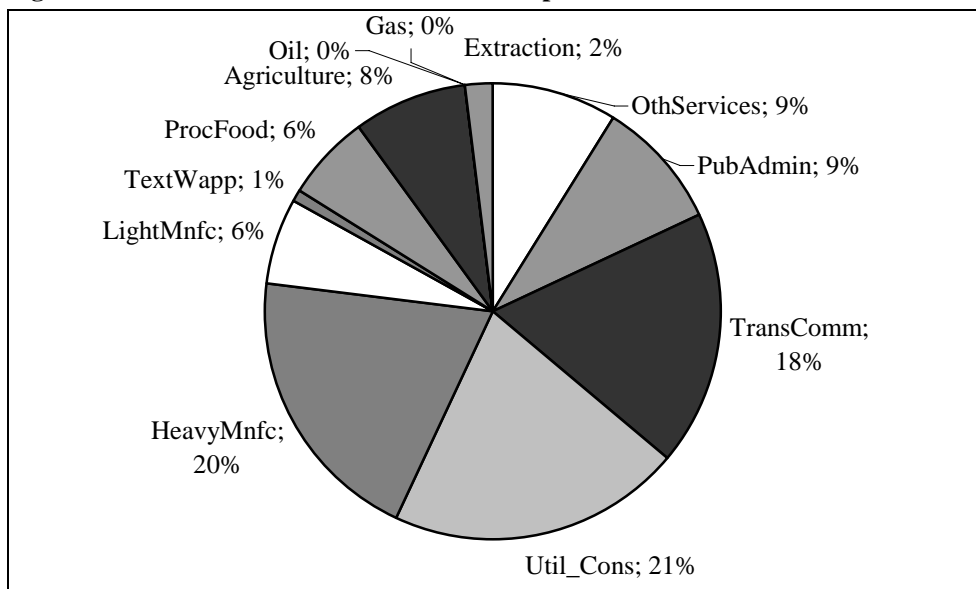
Ukraine together with many other CIS countries is part of the European Neighbourhood Policy. Currently, the EU-Ukraine economic relations are mainly based on the Partnership and Co-operation Agreement (PCA) which entered into force in 1998. The agreement regulates the political, economic and cultural relations between the EU and Ukraine and it is the current legal basis for the EU's bilateral trade with Ukraine. Furthermore, following Ukraine's WTO accession in February 2008, the EU started to negotiate a bilateral Free Trade Agreement. In 2007, the EU and Ukraine launched bilateral negotiations of a new Enhanced Agreement that will replace the present PCA and will include a potential future FTA.

The rest of the study is organized as follows. Section 14.2 offers a general background to the production and trade of Ukraine. Section 14.3 discusses the results. Concluding comments can be found in Section 14.4.

## 14.2. Trade and Production structure of Ukraine

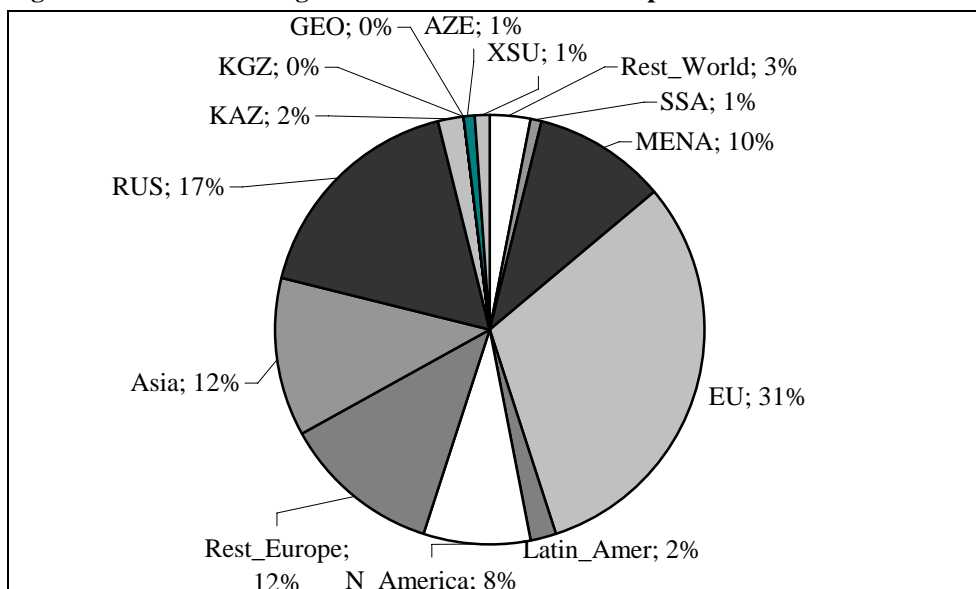
The importance of different sectors in Ukraine's output is depicted in the figure below. Output in services represents a bit less than two-third of total output in Ukraine. Among manufacturing sectors heavy manufacturing sectors take up the most important part of total output, representing about 20%. On the other hand light manufacturing sectors represent only 6%. Agricultural output is about 8% of total output which is similar to the importance of the sector in the Russian economy where it represented about 9% of total output. Processed food contributes to 6% of total output.

**Figure 14.2.1. Share of sectors in Ukraine's output in 2004**



Source: own calculations, data come from GTAP database version 7.

**Figure 14.2.2. Share of regions/countries in Ukraine's exports in 2004**

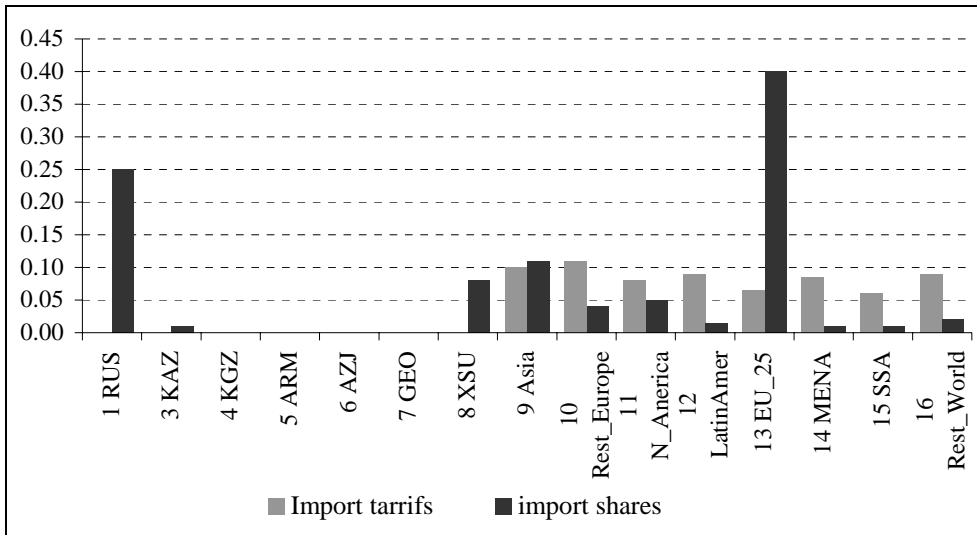


Source: own calculations, data come from GTAP database version 7.

Figure 14.2.2 depicts the importance of different regions and countries in Ukraine's exports. The EU is the most important export destination for Ukraine;

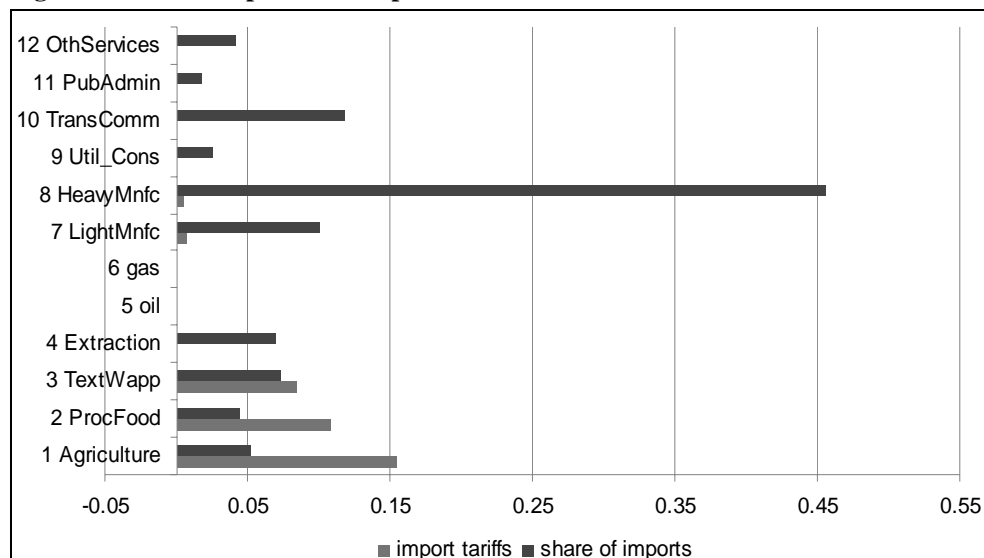
31% of all Ukrainian exports go to the EU. The second biggest export destination is within the CIS region. About 17% of Ukrainian exports go to Russia. Other CIS countries represent only a very limited share of export destinations. Ukraine, similarly to Russia exports about 12% of total exports to other European countries outside the EU (countries not in EU-25) and the CIS and 12% to Asian countries. Figure 14.2.3 depicts Ukrainian imports coming from different destinations and the corresponding import tariffs. Similarly to exports, the EU is the most important import partner with imports coming from the EU representing about 40% of the total. There are no import tariffs for other countries in the CIS region, nevertheless the share of imports coming from these countries is rather small with the exception of Russia from which 25% of imports originate.

**Figure 14.2.3. Imports and import protection in Ukraine in 2004**



Source: own calculations, data come from GTAP database version 7.

Figure 14.2.4 shows EU import tariffs and imports in different sectors originating from Ukraine. The highest import tariffs are in the processed food sector, in agricultural products and in textiles and clothing. The share of imports in these sectors is relatively small being around 4-7% of each sector in total imports. The sector with the highest share of imports is heavy manufacturing which represents almost half of total imports. Imports of light manufacturing products are also important representing about 10% of total imports.

**Figure 14.2.4. EU imports and import tariffs in 2004**

Source: own calculations, data come from GTAP database version 7.

## 14.3. Results

### 14.3.1. Real Income Effects

Trade liberalization would have a negative income effect for Ukraine under all the different scenarios which is shown in Table 14.3.1. The smallest loss would occur under the full FTA scenario which would result in a 0.4% real income decrease. On the other hand the biggest decrease would occur in case of the second scenario amounting to a 2.12% real income decrease. These negative effects are mainly due to the important negative terms of trade effects taking place in Ukraine. Compared to the real income effects of Ukraine, the average effects in the CIS countries would be less negative and would result in an improvement under the third scenario. On the other hand, a small positive net income effect would occur in the EU under all three scenarios. The gains from liberalization for the EU would be the highest under the full FTA scenario and very similar in magnitude under the first two scenarios.

**Table 14.3.1. Real Income Effects (percentage change from baseline)**

Scenario	Partial 1 trade agreement	Partial 2 trade agreement	Full FTA
EU	0.14	0.13	0.21
CIS	-0.53	-0.83	0.62
Ukraine	-0.65	-2.12	-0.40

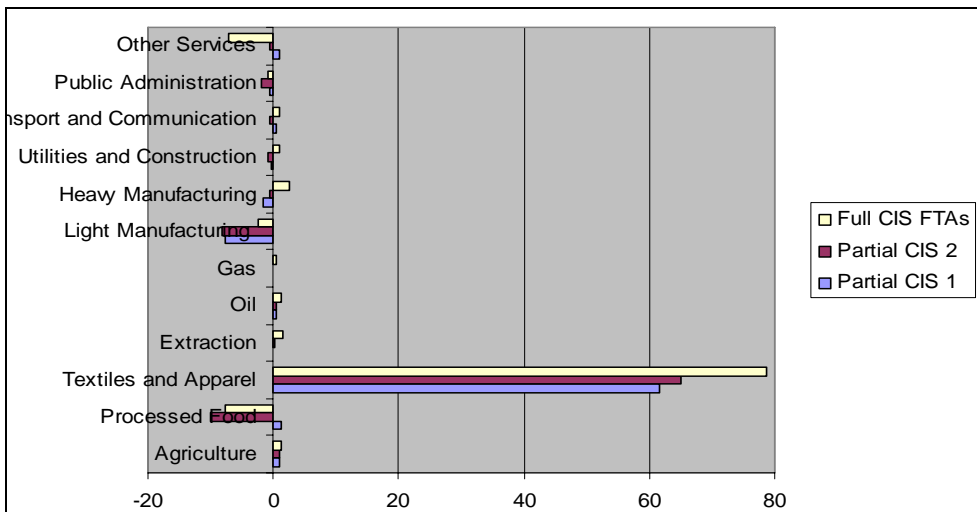
Source: Model simulations.

**14.3.2. Changes in sectoral output in Ukraine**

Our analyses of the expected changes in sectoral output as a result of different forms of trade liberalisation show that important changes would occur in the sectoral output of Ukraine. Figure 14.3.1 depicts changes in the output of different sectors in Ukraine after the three different FTA would take place.

The most pronounced decrease in output would take place in the light manufacturing and processed food sectors. The light manufacturing sector would experience a decrease in output which would be around 8% under the first two scenarios and would be much lower, around 2.5% under the full FTA scenario. The processed food sector would have a small increase in the production under the first FTA scenario and a decrease in output of around 10% under the second scenario and 8% under the full FTA scenario. There are several other sectors where smaller reduction in output would occur under the different scenarios.

**Figure 14.3.1. Changes in Ukraine’s sectoral output**



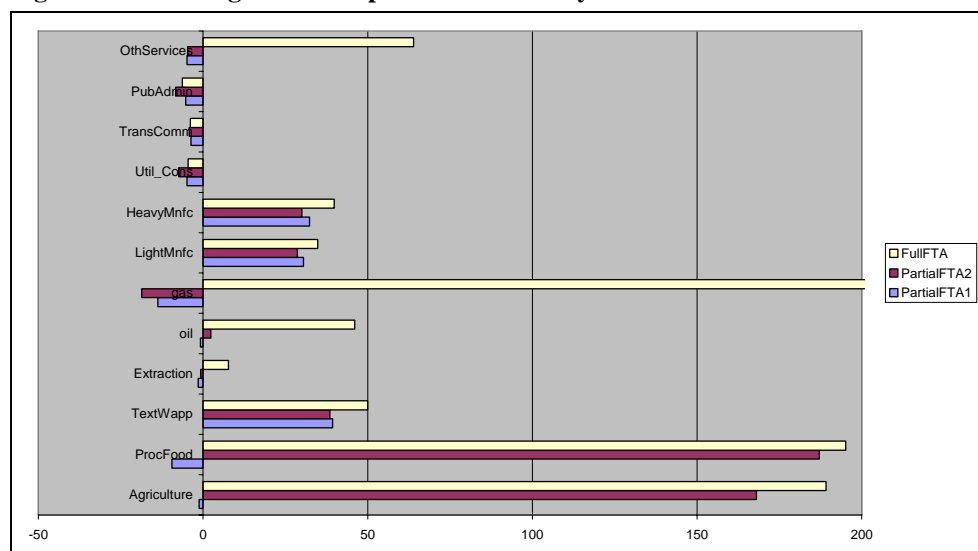
Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The only sector where important increase would occur in output is the textiles and apparel sector. An increase in output would take place in this sector under all three scenarios with the increase being the highest under the full FTA scenario which would imply an almost 80% change in output. Figure 14-3-1 showed the importance of each sector in Ukraine’s output. Textiles and apparel represented only 1% of total outputs in 2004 therefore although there would be an important increase in the output in this sector, increase in terms of level would be rather small.

### 14.3.3. Effects on bilateral trade flows

In this section we provide detailed results on trade impacts in the three scenarios, and we present the changes in trade flows by sector.

**Figure 14.3.2 Changes in EU exports to Ukraine by sector**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The Figure 14.3.2 depicts changes in EU exports towards Ukraine after the three different FTA scenarios. The services sectors experience a small reduction in the first two scenarios. Under the third scenario, trade in services sectors belonging to ‘other services’ is liberalised. As a consequence of this there would be an important, about 63% increase in EU exports in other services sectors towards Ukraine. An important increase would occur in exports of textiles and apparel un-



der all scenarios, the biggest increase (close to 50%) occurring under the third scenario. The most important increase would occur in agricultural and processed food exports under the second and the third FTA scenarios which both include liberalisation of tariffs in agricultural products. The increase in these sectors would be around 160-190% depending on the scenarios. Furthermore, light and heavy manufacturing exports would also increase about 28-39% depending on the scenarios. There would be an increase in gas exports, which according to the graph is important in terms of percentage change compared to the baseline scenario. The table below shows the percentage changes compared to the baseline together with the share of exports in each sector. The share of gas and oil sector's exports is very close to zero, thus the increase shown in the graph in the exports of gas Ukraine in terms of level is minimal.

**Table 14.3.2. Percentage changes in EU sectoral exports to Ukraine**

	<b>Partial FTA 1</b>	<b>Partial FTA 2</b>	<b>Full FTA</b>	<b>Share in total exports</b>
Agriculture	-1.17	168.03	189.14	2.60%
Processed Food	-9.42	187.14	195.10	3.91%
Textiles and Apparel	39.30	38.52	49.95	6.47%
Extraction	-1.48	-0.68	7.71	0.59%
Oil	-0.80	2.34	46.02	0.00%
Gas	-13.73	-18.61	244.19	0.00%
Light Manufacturing	30.47	28.62	34.80	23.05%
Heavy Manufacturing	32.33	29.99	39.81	46.52%
Utilities and Construction	-4.90	-7.40	-4.53	1.27%
Transport and Communication	-3.64	-4.21	-3.83	5.68%
Public Administration	-5.25	-8.35	-6.28	1.42%
Other Services	-4.90	-4.69	63.87	8.49%

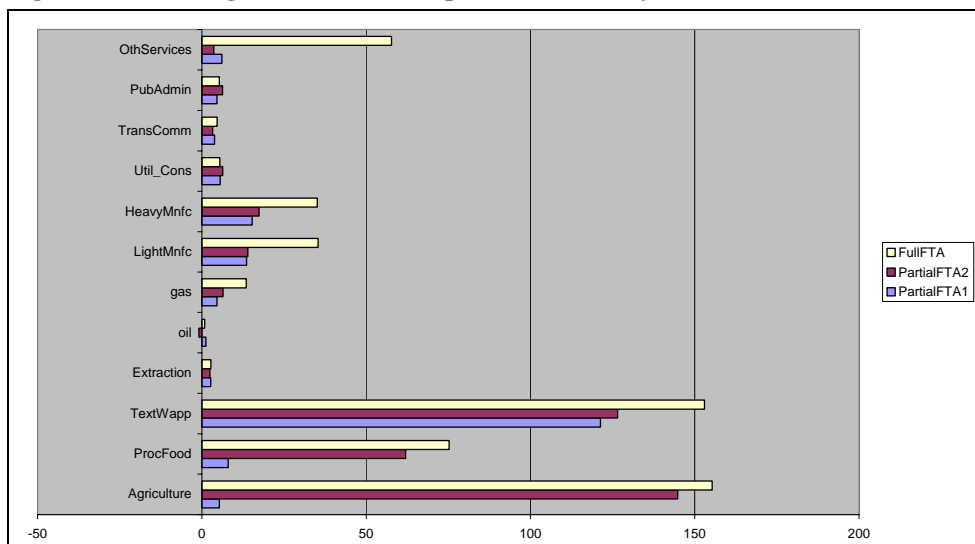
Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

Figure 14.3.3 shows percentage changes in exports of Ukraine by each sector towards the EU. Similarly to the case of EU exports in services, an important increase would occur in other services exports if trade would be liberalised between the EU and the CIS in these sectors.

The most pronounced increase would occur in the textiles and apparel sectors. Under the first and second scenarios, the increase would be around 121-126% and would be 153% in case of full liberalisation. Exports in heavy and light manufacturing would increase by 15-18% under the two first scenarios and by 35% in case of full liberalisation. Increase in exports of processed food and agricultural products would take place under all three scenarios, the effect being small in case of no

liberalisation in agriculture and becoming important once liberalisation in the agriculture and food sectors would also take place.

**Figure 14.3.3 Changes in Ukrainian exports to the EU by sector**



Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

**Table 14.3.3. Percentage changes in Ukraine’s sectoral exports to the EU**

	Partial FTA 1	Partial FTA 2	Full FTA	Share in total exports
Agriculture	5.32	144.8	155.32	5.07%
Processed Food	8.03	62.02	75.22	4.40%
Textiles and Apparel	121.31	126.52	152.94	7.50%
Extraction	2.66	2.42	2.77	6.01%
Oil	1.21	-0.91	0.84	0.02%
Gas	4.63	6.43	13.52	0.02%
Light Manufacturing	13.59	14.02	35.37	10.14%
Heavy Manufacturing	15.31	17.41	35.09	46.60%
Utilities and Construction	5.56	6.35	5.45	2.49%
Transport and Communication	3.88	3.27	4.66	11.59%
Public Administration	4.58	6.30	5.33	1.79%
Other Services	6.11	3.59	57.68	4.37%

Table 14.3.3 shows the percentage changes in sectoral exports together with the share of each sector in total exports towards the EU in the baseline. Although the most important increase would occur in the textiles and apparel sector and in agricultural products with exports to the EU increasing by 150% under the most ambitious scenario, these sector are not the most important export sectors towards the EU.

#### 14.3.4. Other Macroeconomic Results

In this section other macroeconomic results, such as changes in wages and GDP are discussed. These results are summarized in Table 14.3.4 and Table 14.3.5 below. Ukraine would have an increase of 0.68% in its GDP under the full FTA scenario which is shown in Table 14.3.4. This increase is about half of the average increase in CIS but higher than the effects in the EU. Ukraine would experience an increase in wages for both the skilled and unskilled workers. These increases would be higher than those reported for the average of CIS and the EU. The increase in Ukrainian wages would be around 3% for unskilled workers and about 1.8% for skilled workers.

**Table 14.3.4. Macroeconomic results from Full FTA (in %)**

	EU	CIS	Ukraine
Change in GDP	0.18	1.195	0.68
Unskilled worker wage	0.26	1.560	2.94
Skilled worker wage	0.24	1.470	1.78

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The results with regards to the effect on other macroeconomic variables of the more realistic scenarios of trade agreements are summarized in Table 14.3.5 below. These results are different not only in magnitudes but also the sign of the change is reversed for the GDP for Ukraine. While the full FTA and the first scenario would result in an increase in GDP, the second scenario would imply a reduction of 1.5% of GDP for Ukraine.

Both skilled and unskilled workers in Ukraine would experience an increase in their wages which would be higher than those experienced by workers on average in the CIS or in the EU. The increase in wages in Ukraine would be higher for unskilled worker and somewhat lower for skilled workers.

**Table 14.3.5. Macroeconomic results from Partial 1 & 2 trade agreement**

	Partial 1 trade agreement			Partial 2 trade agreement		
	EU	CIS	Ukraine	EU	CIS	Ukraine
Change in GDP	0.12	-0.13	0.04	0.10	-0.35	-1.46
Unskilled worker wage	0.18	0.22	0.94	0.18	0.16	0.97
Skilled worker wage	0.16	0.32	0.64	0.15	0.36	0.36

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

### 14.3.5. Terms of Trade Effects

The table below shows terms of trade effects in the case of a full free trade agreement with liberalization in not only agriculture and manufacturing products but also services trade and reduction in technical barriers. While the EU would have small terms of trade improvement amounting to about 0.11%, the CIS on average would experience 0.83% deterioration and the terms of trade deterioration would amount to 1.49% in the case of Ukraine.

**Table 14.3.6. Terms of trade results from Full FTA (in %)**

	<b>EU</b>	<b>CIS</b>	<b>Ukraine</b>
Terms of trade effects	0.11	-0.83	-1.49

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

The terms of trade effects for the two other forms of trade liberalisation are presented in the table below. Ukraine again, similarly to the full FTA case would experience a terms of trade deterioration. This decrease in terms of trade would be very similar in magnitude under the first and second scenario while being higher under the full FTA scenario. On the other hand the terms of trade gains for the EU would be significantly much smaller than for Ukraine and always positive.

**Table 14.3.7. Terms of trade results from Partial 1 & 2 trade agreement**

	<b>Partial 1 trade agreement</b>			<b>Partial 2 trade agreement</b>		
	<b>EU</b>	<b>CIS</b>	<b>Ukraine</b>	<b>EU</b>	<b>CIS</b>	<b>Ukraine</b>
Terms of trade effects	0.09	-0.63	-0.89	0.10	-0.76	-0.94

Source: Model simulations. Note: All results are reported as percentage change compared to baseline.

## 14.4. Conclusions

In this study we explore the economic effects of potential measures to liberalize trade between the European Union and Ukraine. In so doing, we have a Computable General Equilibrium Model, CGE Model, based on the most recent version of the GTAP data base, i.e. GTAP 7, which is benchmarked to data from 2004. Our CGE model follows recent research in trade theory in taking differences in underlying industry specific market structures and elasticities into account. Furthermore, the model incorporates estimated non-tariff trade barriers to trade in services, stemming from industry-specific gravity equation, which enhances the analysis of

the service sector. The results are compared to a baseline which incorporates recent developments in the trade policy environment, i.e. the phase out of ATC, enlargement of the EU and CIS accessions to the WTO. The analysis takes agricultural liberalization, liberalization in industrial tariffs, and liberalization in services trade as well as trade facilitation measures into account.

The importance of the EU as a trading partner is very significant for Ukraine. On the other hand, the trade with Ukraine represents a rather small share in the EU's total trade. As a consequence of this asymmetric relationship the effects of an FTA between the EU and the CIS would have asymmetric effects on the EU and Ukraine. The impact of an FTA would be more pronounced for Ukraine and rather marginal for the EU.

Only a rather limited income effect would occur in the EU as a consequence of the FTAs while the income effect in Ukraine would be higher in magnitude. While Ukraine would experience a negative income effect under all different FTA scenarios the effect for the EU would be small but positive. These negative effects are mainly due to the important negative terms of trade effects taking place in Ukraine.

The change in GDP in the two regions reflects similar developments. A reduction in GDP would take place in Ukraine under the second FTA scenario which is limited to elimination of tariffs on trade in goods. The first FTA scenario which is limited to elimination of tariffs in industrial goods would have a very small but positive effect. On the other hand a bit higher, positive effect would occur under the third scenario.

## References

- Antweiler, W. and D. Trefler 2002. "Increasing Returns and All That: A View from Trade," *American Economic Review*, 96: March.
- Copenhagen Economics and J. Francois (2007), "Economic Impact of a Potential Free Trade Agreement (FTA) Between the European Union and South Korea," European Commission DG Trade document no. 134017.
- Dimaranan, B. V. and McDougall, R. A. Editors (2006, forthcoming), *Global Trade, Assistance, and Production: The GTAP 6 Data Base*, Center for Global Trade Analysis, Purdue University.
- Ethier, W. (1982), "National and International Returns to Scale in the Modern Theory of International Trade," *American Economic Review*, 72 (June), 950-959.
- Finger, J.M., U. Reincke, and M. Ingco (1996), *The Uruguay Round: Statistics on Tariff Concessions Given and Received*, World Bank: Washington.
- Fox, Alan K. (1999), "Evaluating the Success of a CGE Model of the Canada-U.S. Free Trade Agreement," presented at The Second Annual Conference in Global Economic Analysis, June 20-22.
- Francois, J.F. (1998), "Scale economies and imperfect competition in the GTAP model," GTAP consortium technical paper.  
[http://www.gtap.agecon.purdue.edu/resources/res\\_display.asp?RecordID=317](http://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=317)
- Francois, J.F. (2001), *The next WTO round: North-South stakes in new market access negotiations*, CIES Adelaide and the Tinbergen Institute, CIES: Adelaide. ISBN: 086396 474 5.
- Francois, J.F. and B. McDonald (1996), "Trade liberalization and the capital stock in the GTAP model," GTAP consortium technical paper.  
[http://www.gtap.agecon.purdue.edu/resources/res\\_display.asp?RecordID=310](http://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=310)
- Francois, J.F. and D.W. Roland-Holst (1997), "Scale economies and imperfect competition, in Francois, J.F. and K.A. Reinert, eds. (1997), *Applied methods for trade policy analysis: a handbook*, Cambridge University Press: New York.
- Francois, J.F., H. van Meijl and F. van Tongeren (2005), "Trade Liberalization in the Doha Development Round," *Economic Policy* April: 349-391.

- Francois, J. F. and Copenhagen Economics (2007) "Economic Impact of a Potential Free Trade Agreement (FTA) Between the European Union and South Korea", Report Prepared for the European Commission, mimeo
- Francois, J. F., B. Hoekman and J. Woerz (2007) "Does Gravity Apply to Nontangibles: Trade and FDI Openness in Services", Plenary Paper at the 2007 ETSG meeting and an unpublished version (2008).
- Hall, R.E. (1988), "The relation between price and marginal cost in U.S. industry", *Journal of Political Economy*, Vol. 96, No. 5, pp. 921-947.
- Helpman, E. and P. R. Krugman (1989), Trade policy and market structure, Cambridge, MA; MIT Press.
- Harrison, W.J. and Pearson, K.R. (1998) Gempack User Documentation, Monash University, Melbourne.
- Hertel, T. and M. Tsigas (1996), "The Structure of GTAP," in Hertel, T., ed., (1996), *Global Trade Analysis*, Cambridge University Press: Cambridge MA.  
<http://www.gtap.agecon.purdue.edu/models/current.asp>
- Krugman, P. R. (1979), *Increasing Returns, Monopolistic Competition and International Trade*, *Journal of International Economics* 9, 469-479.
- Krugman, P. R. (1980), Scale economies, Product Differentiation and the Pattern of Trade, *The American Economic Review* 10, 950-959.
- Martins, J.O., Scarpetta, S. and D. Pilat (1996), "Mark-Up Ratios In Manufacturing Industries Estimates For 14 OECD Countries," OECD Economics Department Working Paper No. 162.
- McDougall, R., ed. (2001). *The GTAP database -- version 5*, Global Trade Analysis Center: Purdue University.
- Roeger, W. (1995), "Can Imperfect Competition explain the Difference between Primal and Dual Productivity Measures? Estimates for US manufacturing", *Journal of Political Economy*, Vol. 103, No. 2, pp. 316-330.