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LIBERALIZATION OF TRADE FLOWS  
UNDER TTIP FROM A SMALL COUNTRY  
PERSPECTIVE. THE CASE OF POLAND

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**Liberalization of trade flows under TTIP from a small country perspective.  
The case of Poland**

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**Abstract**

The empirical ex-ante evaluations of the Transatlantic Trade and Investment Partnership are similar on aggregate but suggest a large heterogeneity of the TTIP impact at the individual country level. We aim to provide a comprehensive evaluation of the possible TTIP effects for the economy of Poland using a computable general equilibrium model. In our simulation scenarios we use the estimates of NTBs that allow us to differentiate the impact of NTBs on trade of Poland, the remaining NMS aggregate, Germany, the largest trading partner of Poland and the rest of EU-15. We show that from a point of view of a small country, where most of international trade is concentrated on exchange with one or a few neighboring trading partners, such as Poland, simultaneous trade liberalization with a third partner will not bring sizeable gains to its economy. We observe US-EU15 trade expansion to be crowding out some of the trade in the most important Polish trading sectors, such as chemicals and motor vehicles. The unfavorable change in the terms of trade makes the gains from trade small while some sectors reduce output by a considerable amount.

**Keywords:**

TTIP, trade liberalization, computable general equilibrium, Poland

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## INTRODUCTION

The Transatlantic Trade and Investment Partnership (TTIP) is a free trade agreement between the European Union and the United States. The beginning of negotiations has been announced in 2013 but some dialogue on the possible trade liberalization between US and Europe has been going on since the early 1990s. The initiative of the TTIP seems to be one of the proliferating trade agreements that EU has been negotiating in the recent years with other developed (eg. Canada, Japan and Singapore) and developing countries (ACP, MENA and the CEEC) as a result of the stall in the multilateral negotiations of the Doha round of the WTO.

The TTIP is a broad economic agreement. It covers trade, investment and government procurement facilitation. As far as international trade is concerned, apart from elimination of most of the overall low bilateral tariffs (except some tariff peaks in the agricultural trade), the focus of the agreement is on reduction in the non-tariff barriers both in merchandise trade and in services. This includes regulatory cooperation, in the form of review of existing rules and increased mutual regulation and standards recognitions, while cooperating on joint elaboration of newly introduced technical and safety regulations. Separate chapters of the negotiated agreements will be devoted to technical barriers to trade (TBT) and sanitary and phytosanitary measures (SPS). Some sectors require sector-specific chapters and these include inter alia chemicals, pharmaceuticals and motor vehicles where the national regulations are usually the most frequent. The agricultural sector is believed to be one of the most difficult chapters due to protectionist SPS measures.

The public debate in Poland and other European countries has been dominated by the somewhat political discussion fostered by several non-governmental organizations mostly on issues related to the protection on investment and the harmonization of regulations, but most of all, the lack of transparency of negotiations (however, TTIP negotiations are much more transparent than most of the previous trade negotiations). The negotiation chapters have been made public in 2015 by the European Commission.

As far as international trade is concerned, there have been numerous attempts to evaluate the possible effects of TTIP. CEPR (2013b) provides an EU-commissioned impact assessment, mainly focused on trade and investment for the aggregate economy of the EU and the US. The results of elimination of tariffs and a partial elimination of non-tariff barriers show that in the most ambitious scenario, TTIP may lead to changes in GDP of roughly 0.4 to 0.5 percent of GDP of the US and EU respectively, most of which is attributed to the reduction of non-tariff barriers.<sup>1</sup>

The methodology of both the EU-wide and country-specific evaluations found in the literature is to some extent standard: most of them use global computable general equilibrium models. The impact scenarios involve tariff liberalization and partial removal of non-tariff barriers (that are either estimated or based on external sources). While the overall effects of the EU vary to some extent but are close to the ones provided by

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<sup>1</sup> While these estimates are not available at disaggregated country level, CEPR provided some selected results for Poland's Ministry of Economy that evaluate the TTIP impact at 0.2 percent of GDP.

CEPR (2013b), the distribution of gains from TTIP across the EU members seems to be uneven. Fontagne et al. (2013) estimate the trade impact of roughly 50% in the EU-US trade and the overall level of GDP gains at 0.3 percent of GDP, with Germany gaining the most (0.4% of GDP) and the NMS in the ballpark of 0.2% of GDP. Kinnman and Hagberg (2012) provide detailed estimates for Sweden using a GTAP model and show that due trade liberalization extra GDP gain are at the level of 0.2%, close to the EU26 average in this study. CEPR (2013a) shows a percentage gain in GDP for the United Kingdom of roughly half the gain for the aggregate of remaining EU26 countries.

In this study, we aim to provide a comprehensive evaluation of the possible TTIP effects for the economy of Poland. We use the GTAP computable general equilibrium model, a widely used CGE modelling framework. In order to capture the country specificity, in our simulation scenarios we use the estimates of NTBs (estimations are described in an auxiliary paper) that allow us to differentiate the impact of NTBs on trade of Poland, the remaining NMS aggregate, Germany, the largest trading partner of Poland and the rest of EU-15. This way we can extensively analyse not only the bilateral impact of the TTIP on Poland and the US but also on the bulk of bilateral trade relations of Poland.

We show that from a point of view of a small country, where most of international trade is concentrated on exchange with one or a few neighboring partners, such as Poland, simultaneous trade liberalization with a third partner will not bring sizeable gains to its economy. We observe US-EU15 trade expansion to be crowding out some of the trade in the most important Polish trading sectors, such as chemicals and motor vehicles. The unfavorable change in the terms of trade makes the gains from trade small while some sectors reduce output by a considerable amount.

This paper is organized as follows. In the first section we provide a Poland-EU-USA trade profile, where we analyze bilateral trade relations to identify the reciprocal importance of each of the analyzed trading partners with the US and vice versa, provide sectoral analysis of relative trade balances and comparative advantages. We proceed with a brief discussion the model and simulation scenarios. In the subsequent section we provide detailed results. We conclude with a brief discussion of the main features of the simulations.

## POLAND-EU-USA TRADE PROFILE

The potential of the benefits from TTIP to a large extent depends on the intensity of existing trade relations. Table 1 shows the shares of total US trade with the particular EU members and shares of EU members trade with the US in their total trade. These shares are very diversified both in merchandise trade and services. First of all, EU as a whole is an important trade partner for the US, responsible for roughly 20% of US services trade and 14% of US merchandise trade. Most of it is, however, due to trade with Germany and the rest of the EU-15, while Poland and the remaining NMS contribute very little. Trade with Germany is relatively more intensive in merchandise trade than in services, compared to the remaining EU-15 aggregate.

EU as a whole is more important to the US than the US to the EU in terms of bilateral trade relations. The overall share of the EU28 exports to the EU both in services and in merchandise trade stands at 5-6%. However, US share of Poland and the NMS is considerably lower than in the EU15. From the point of view of relative importance, German involvement in trade of the US is significant, especially on the export side of merchandise trade but also in services.

**TABLE 1 IMPORTANCE OF BILATERAL TRADE RELATIONS, 2011 (SERVICES), 2013 (MERCHANDISE TRADE)**

Country	USA trade		EU countries trade	
	Share of imports	Share of exports	Share of imports	Share of exports
Merchandise trade				
Poland	0,2	0,2	2,7	2,4
Germany	4,3	2,5	5,7	8,3
rEU15	9,2	10,9	5,6	6,7
rNMS	0,5	0,4	1,7	2,2
Overall	14,3	13,9	5,1	6,5
Services				
Poland	0,3	0,3	3,9	2,8
Germany	5,4	4,5	7,0	6,8
rEU15	14,9	14,3	5,5	4,2
rNMS	0,6	0,6	3,3	2,5
Overall	21,2	19,7	5,6	4,5

Source: Comtrade, Francois' services data,

USA trade: country/region share in total US trade, EU trade: US share in total trade

We analyze the sectoral split of bilateral trade from two angles. First, we compute the revealed comparative advantage indices and second, we analyze the balance of trade in each sector as a percentage of total bilateral trade. The first column of Table 2 shows the relative RCA's of the EU countries in their exports to the US (relative competitiveness of analyzed regions in their trade to US). The pattern of trade is somewhat clear. EU15 countries have slight comparative advantages in most manufacturing sectors. That excludes Germany, where RCA's are concentrated within the automobile industry, machinery and metal industry. On the other hand, Poland reveals comparative advantage in agriculture, light manufacturing including food, textiles, wood but also in the some heavy industries such as minerals, metals, metal products but also in the production of remaining transport equipment and electrical equipment. Similar patterns emerge for the remaining NMS. While there seems to a certain degree of specialization among the NMS and the EU15, one has to bear in mind that NMS trade with the US is somewhat negligible compared to the EU15. As far as services are concerned, business services reveal comparative advantage in Poland and Germany as well as recreation. Construction seems to be an important export service sector in Germany and to a smaller extent communication.

TABLE 2 REVEALED COMPARATIVE ADVANTAGE INDICES

sector	RCAs of EU countries in trade to US				RCAs of US in trade to EU			
	Germany	Poland	rEU15	rNMS	Germany	Poland	rEU15	rNMS
Agriculture	0,6	1,8	1,1	1,9	0,9	0,7	0,8	1,0
Mining	0,0	0,2	1,5	0,2	0,2	0,2	0,2	0,3
Food	0,3	1,5	1,4	0,4	0,4	1,1	0,3	0,5
Textiles	0,7	1,1	1,1	1,4	0,3	0,4	0,3	0,4
Apparel	0,0	0,9	1,3	3,4	0,1	0,0	0,1	0,1
Leather	0,1	0,2	1,4	1,1	0,1	0,1	0,1	0,1
Wood	0,5	6,7	1,0	2,4	0,2	0,2	0,4	0,3
Paper	0,9	0,7	1,1	0,3	0,6	1,0	0,9	0,9
Coal Petrol	0,1	0,9	1,4	1,6	0,6	0,1	1,3	1,7
Chemicals	0,8	0,3	1,1	0,5	1,5	1,0	1,6	1,0
Minerals	0,7	1,7	1,1	1,4	1,6	0,9	0,7	1,4
Steel	0,8	0,3	1,1	1,8	0,2	0,1	0,2	0,1
Metals	1,3	1,2	0,9	0,5	0,5	0,5	0,9	0,4
Metal Products	1,3	1,6	0,9	1,0	0,9	1,0	0,8	0,7
Motor Vehicles	2,2	0,5	0,4	1,0	1,0	0,4	0,2	0,6
Transport Eq. Nec	0,7	2,6	1,2	0,3	2,9	6,4	5,5	5,5
Electrical Eq.	0,8	4,1	0,8	4,5	0,9	0,6	0,7	1,3
Machinery	1,2	1,0	0,9	1,3	1,6	1,6	1,7	1,8
MnfcsNec	0,3	0,4	1,4	0,4	1,0	0,5	1,5	1,0
Construction	2,2	0,3	0,6	0,7	0,3	0,1	0,2	0,0
Trade	1,2	0,1	0,9	2,8	0,3	0,1	0,1	0,2
Transport	0,6	0,9	1,1	0,6	0,7	0,9	0,6	0,4
Communication	1,1	0,9	0,9	1,2	1,6	0,6	0,5	2,0
Fin. Svcs	0,6	0,7	1,2	1,2	0,4	2,6	0,8	0,7
Insurance	0,8	0,2	1,1	0,2	0,3	1,6	0,2	0,5
Business Svcs	1,2	1,3	0,9	1,1	1,4	1,2	1,5	1,2
Recreation, Nec	1,4	1,7	0,7	4,2	2,2	1,7	0,9	5,8

Source: own calculation using Comtrade trade database and Francois services data.

EU RCA's are relative to total EU27 exports to US. US RCA's are relative to total countries imports

There are just a few sectors where the US has a notable comparative advantage in exports to the EU compared to other EU trade partners including EU itself. These include most notably, transport equipment nec (RCA across all analyzed EU countries/regions, due mostly to trade in aircraft) but also machinery and equipment. For the EU15 including Germany, an important sector in imports from the US is the chemical industry. As far as services are concerned, business services imports from the US are relatively large across all analyzed country groupings. US exports also reveal a comparative advantage in communication (NMS including Poland), financial services and insurance (Germany) and recreation.

Sectoral trade balance shows the competitive position in the bilateral position of EU members and the United States. Table 3 shows that the important export sectors for Germany and the EU where there is a trade surplus are mostly motor vehicles, machinery and products of the metal industry but also apparel, textiles, leather and wood. Trade deficits are mostly in agriculture, mining and electrical and transport equipment nec. In Poland, trade deficits span across a larger number of sectors and include also motor vehicles, food, textiles and steel. On the other hand one can observe a significant trade surplus in the remaining NMS aggregate.

TABLE 3 SECTORAL TRADE BALANCES

	Germany	Poland	Rest of EU15	Rest of NMS
Agriculture	-75,1	-58,0	-63,2	-32,7
Mining	-97,4	-97,0	-33,3	-92,7
Food	13,9	-11,4	51,5	-21,1
Textiles	20,4	-10,9	32,4	17,1
Apparel	31,0	68,1	71,4	80,4
Leather	58,9	-9,5	76,2	77,8
Wood	46,9	90,7	31,1	78,5
Paper	10,2	-64,7	-19,0	-52,0
Coal Petrol	-82,0	97,9	6,7	23,8
Chemicals	14,8	-51,7	3,4	4,0
Minerals	-4,8	23,8	38,8	21,6
Steel	63,9	-20,2	59,1	84,9
Metals	29,1	11,2	-26,1	14,7
Metal Products	29,3	-13,7	16,0	6,8
Motor Vehicles	70,7	-23,2	65,2	58,4
Transport Eq. Nec	-20,0	5,9	-18,4	5,7
Electrical Eq.	-20,1	-47,9	-18,9	3,9
Machinery	35,4	-14,1	7,1	5,0
Construction	9,1	-38,0	4,8	68,5
Trade	43,2	-43,0	59,3	67,8
Transport	-1,5	1,4	35,7	9,4
Communication	-24,2	22,4	22,4	-45,1
Fin. Svcs	15,2	-49,2	-8,4	40,5
Insurance	57,9	-70,7	52,3	-40,0
Business Svcs	-5,3	-6,7	-32,9	-10,3
Recreation, Nec	-32,3	-59,5	-35,4	-63,2

Source: Trade - Comtrade, Services Francois' data,  
share in percent of total sectoral trade =  $100 * (X-M)/(X+M)$

The analysis presented in this section shows that Poland has a relatively more imbalanced trade towards the US, reveals few comparative advantages and trades less than other EU countries under consideration, despite its size. This simple analysis shows that the benefits from direct trade liberalization with the US may be small with the benefits expected for other EU countries. Moreover, intensification of trade between other EU members and the US may lead to a decrease in Poland's intra-EU trade relations due to the initial asymmetry.

## THE MODEL AND DATA

To evaluate the effects of trade liberalization, we employ the GTAP computable general equilibrium model and database developed by the Global Trade Analysis Project at Purdue University.

The GTAP is a commonly used framework for trade policy analysis. The structure of the model is relatively simple while allowing for a large range of simulations<sup>2</sup>. The basic economic agent in the model is the so-called regional household that maximizes the regional utility subject to income constraints. This regional household

<sup>2</sup>For a complete description of the model consult Hertel, Tsigas (1997).

takes all the expenditure decisions within the region's economy, by choosing the levels of private consumption, government expenditures and savings .

The regional household preferences are multiply nested. In the top nest the private consumption, public consumption and overall regional savings are aggregated using a Cobb-Douglas function (this assumption ensures that within each region the respective consumption and saving shares are constant). While within the government consumption, the sectoral structure is preserved by a lower level Cobb-Douglas composite, private consumption demand is governed by a Constant Difference of Elasticity preferences to account for the non-homothetic nature of consumption demand. Each of the goods and services consumed is in fact a constant-elasticity of substitution aggregate of domestic and foreign goods and services according to the Armington setting.

Firms produce using intermediate goods and primary factors purchased from the regional household and. The sources of primary factors are purely domestic – it is assumed that the factors are strictly immobile internationally and mobile within a region (with exception of land and natural resources). The intermediate goods can be either domestically produced and imported.

The GTAP database has information on 57 sectors in 129 regions. This data includes information on the production volume, sales both domestic and international, intermediate use and primary factor use. It also contains information about bilateral trade between countries in both goods and services. Version 8 of the database uses year 2007 as a reference year<sup>3</sup>. For the purpose of this paper, we have created an aggregated database (regional aggregation and sectoral aggregation, mainly in the agriculture and food sectors).

All the descriptive statistics presented in the previous sectors are produced on the basis of the Comtrade statistics taken from the WITS database. Services trade data come from Francois & Pindyuk (2013).

## SIMULATION SCENARIOS

Tariffs are overall low Table 4 shows bilateral effectively applied tariffs in each of the analyzed sectors weighted by the respective trade flows (at HS6 digit level). Overall, the tariffs applied by the EU towards the US are overall higher than those applied on US imports from the EU. There are some product categories, where tariffs are overall higher and they include the processed food sector, the automotive sector in the EU and the textiles and apparel in both US and the EU. We update the tariff rates in the GTAP database to reflect these 2011 rates (however, the baseline 2007 tariff levels in the original data did not differ to a large extent). All our simulation scenarios feature a complete tariff removal. However, given the low level of pre-liberalization tariffs and the moderate level of trade between US and the EU, the sole removal of tariffs brings virtually zero macroeconomic effects.

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<sup>3</sup>Database details are to be found here: <https://www.gtap.agecon.purdue.edu/databases/v8/>



What matters are the non-tariff barriers. In order to assure consistency with the database used in the simulations, we apply common methodology to estimate non-tariff barriers both for merchandise trade and services trade within the GTAP sectors. We follow (Park 2002) and (Fontagné, Guillin and Mitaritonna, Estimations of Tariff Equivalents for the Services Sectors 2011) by calculating the tariff equivalents based on the importer fixed effects in the gravity equation. We base the estimations for the merchandise trade data on Comtrade bilateral trade statistics aggregated to GTAP sectors. The gravity control variables come from the World Development Indicators database and the CEPII dataset. The details of estimations are provided in (Hagemejer and Sledziewska 2015).

Our estimates allow us to differentiate between the NTB estimates for the EU-15, NMS and Poland. Since gravity estimations are based on the residuals of regression equation, countries with less than average trade (controlling for gravity factors) will exhibit larger tariff equivalents. This is the case for the NMS and Poland, where the estimated NTBs are in many cases higher than those of the EU15.

Ecorys (2009) presents a study on non-tariff barriers in the EU-US trade. While their EU aggregate estimates of NTB's also come from a version of the gravity model, they also perform a thorough analysis of NTBs actionability. This actionability is estimated at roughly 50% of the initial level of NTBs. We treat the 50% actionability as the baseline scenario in our simulation. We consider three scenarios: Partial, Actionable and Complete. They correspond to a removal of respectively 25, 50 and 100 percent of non-tariff barriers on top of the complete removal of tariffs. We treat the complete removal of NTBs as an upper bound for long-run possible effects of TTIP. However, we do not impose any shocks on the Coal-Petrol sector of the manufacturing industry as we believe that the analysis within this sector goes beyond the scope of our modelling. Moreover, in our scenarios we include the agriculture and food sectors. However, the estimated tariff equivalents in this sector seem low contrary to the anecdotal evidence. This may stem from the fact that as international trade in agricultural goods is highly protected around the world and therefore the gravity model underestimates the tariff equivalents. In such case, the effects of trade liberalization for those sectors may be underestimated.

TABLE 4 BILATERAL TARIFFS, 2011

Sector	US vs EU				EU vs US			
	Poland	NMS	Germany	EU15	Poland	NMS	Germany	EU15
Agriculture	2,1	19,1	1,9	2,9	5,2	5,6	3,4	3,5
Mining	0,3	0,1	0,5	0,0	0,0	0,0	0,0	0,0
Food	4,3	6,4	3,7	3,0	11,8	24,7	10,2	13,7
Textiles	5,2	6,0	5,5	7,2	6,1	6,6	7,1	6,8
Apparel	11,8	11,6	9,0	9,5	10,7	10,3	10,0	10,0
Leather	6,2	5,8	8,1	7,4	5,6	6,2	4,4	3,8
Wood	0,3	0,3	0,4	0,5	3,1	1,6	2,7	1,5
Paper	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Coal Petrol	0,7	1,3	1,3	1,3	0,9	2,1	2,1	1,9
Chemicals	1,6	1,4	1,3	1,1	2,7	2,9	2,0	2,1
Minerals	9,8	4,7	2,9	5,0	2,3	3,5	3,2	3,0
Steel	0,2	0,5	0,2	0,1	0,5	0,6	0,6	0,4
Metals	1,7	3,6	2,4	1,4	4,1	3,5	2,5	1,4
Metal Products	1,1	2,2	2,0	1,9	2,4	3,1	1,4	2,4
Motor Vehicles	0,8	1,2	1,2	1,2	8,8	9,0	9,4	6,5
Transport Eq. Nec	0,1	0,4	0,2	0,1	1,4	1,4	1,3	1,3
Electrical Eq.	0,9	0,1	0,3	0,3	0,5	0,5	0,4	0,6
Machinery	1,2	1,2	0,9	0,8	1,2	1,4	1,3	1,2
Manufacturing nec	1,5	1,1	0,9	0,7	2,7	1,9	1,4	1,0

Source: TRAINS

In addition to the 3 short run scenario, we also provide a long-run scenario where we allow for investment-triggered capital accumulation as described by Baldwin (1992) and applied by Francois and McDonald (1996), where capital stock increases at the rate that is equal to investment, mimicking the steady-state in a dynamic growth model.

The simulation scenarios assume that iceberg transport costs go down as a result of the removal of trade barriers. This translates directly to a drop in import prices. For example, if the initial tariff equivalent was 10 percent and we assume complete liberalization, then the prices have to decrease accordingly. If the gross import price before liberalization was  $P_0=1.1$ , then the price after liberalization will be equal to  $P_1=1$ . So the price has to go down by  $0.1/1.1 \approx 0.09$ , 9 percent.

TABLE 5 ESTIMATED TARIFF EQUIVALENTS OF NTBS

Sector	Tariff Equivalent			
	EU-15	NMS	Poland	USA
Total	21%	18%	26%	23%
Agriculture	31%	36%	33%	44%
Mining	17%	22%	30%	24%
Food	36%	46%	46%	25%
Textiles	27%	22%	21%	32%
Apparel	33%	27%	26%	42%
Leather	30%	23%	28%	43%
Wood	25%	27%	33%	21%
Paper	37%	32%	47%	46%
Coal Petrol	73%	91%	133%	0%
Chemicals	19%	17%	19%	23%
Minerals	35%	26%	32%	28%
Steel	40%	45%	54%	37%
Metals	40%	35%	44%	46%
Met. Prod.	29%	16%	27%	39%
Motor Veh.	38%	26%	35%	44%
Tr. Eq. Nec	21%	23%	23%	29%
Electric	35%	18%	29%	51%
Machinery	27%	15%	25%	38%
MnfcsNec	26%	17%	26%	15%
Construction	43%	52%	52%	58%
Trade	32%	51%	60%	22%
Transport	28%	43%	45%	20%
Communication	16%	27%	26%	3%
Fin. Svcs	24%	29%	30%	4%
Insurance	15%	23%	24%	11%
Business Svcs	11%	14%	12%	9%
Rec. Svcs	10%	13%	18%	7%

Source: Hagemeyer & Sledziwska (2015)

Therefore the shock to the import price will be equal to  $AT/(1 + T)$ , A – the is the depth of liberalization (100%, 50%, 25%) and T – initial level of tariff equivalent. The shocks in the GTAP model are imposed on the *ams* parameter. “Shocks to  $ams(i,r,s)$  represent the negative of the rate of decay on imports of commodity or service *i* from region *r* imported by region *s*. When  $ams(i,r,s)$  is shocked by 20%, then 20% more of the product becomes available to domestic consumers -- given the same level of exports from the source country. In order to ensure that producers still receive the same revenue on their sales, effective import prices (*pms*) fall by 20%”.<sup>4</sup>

<sup>4</sup>Hertel, TR, McDougall, R. and Itakura, K., GTAP Model Version 6.0

[https://www.gtap.agecon.purdue.edu/resources/res\\_display.asp?RecordID=576](https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=576)

## SIMULATION RESULTS

The overall impact on the macroeconomic aggregates is moderate but it varies slightly across the analysed economies. In the actionable scenario the gains range from 0.2% of an increase in GDP of Poland and the NMS, through 0.4 and 0.3 for Germany and the rest of EU15 respectively to 0,5 in the US. The policy shock has a minor effect on the third countries. In the partial liberalization scenario, the gains amount to roughly half of the scale of the actionable scenario, whereas in the complete scenario they reach 1.1 percent of GDP in the case of the US and considerably less in the other involved countries and regions. The distribution of the gains is somewhat in line with the overall involvement in the bilateral trade. US gains slightly more than the EU-15, while the NMS and Poland gain the least. The extra capital accumulation in the long run scenario brings additional welfare gains to all economies involved and they amount to roughly 0,1% of extra GDP for Poland and the NMS and proportionately more for Germany, EU-15 and the US.

TABLE 6 CHANGES (%) IN GDP

scenario	Poland	NMS	Germany	EU15	US	rEurope	Turkey	rAmerica	Asia	RoW
Partial	0,1	0,1	0,2	0,2	0,2	0,0	0,0	0,0	0,0	0,0
Actionable	0,2	0,2	0,4	0,3	0,5	0,0	0,0	-0,1	0,0	0,0
Complete	0,4	0,4	0,8	0,7	1,1	-0,1	0,0	-0,1	-0,1	-0,1
Actionable - LR	0,3	0,3	0,9	0,7	0,9	-0,1	-0,3	-0,4	-0,3	-7,8

Source: own simulation. LR - Long Run.

There is a large discrepancy in the size of the shock to the total international trade of the involved partners and it is easily explained by the initial trade shares. The large output effects in the US are largely due to a rather significant increase in the overall exports of 8.1 percent in the actionable trade liberalization scenario. In the EU-15 economies including Germany, the increase in trade is much more moderate at the level of close to 1%, while for Poland and the NMS the mild increase in exports is below 0.5 percent. It is, however, worth noting that due to important trade linkages with Turkey, as a result of the increase in bilateral trade between EU and the US, exports of Turkey increase by more than those of the NMS in percentage terms. In the remaining country groupings beyond the partners involved in the TTIP, there is a substantial fall in imports.

TABLE 7 CHANGES (%) IN OVERALL EXPORTS

scenario	Poland	NMS	Germany	EU15	US	rEurope	Turkey	rAmerica	Asia	RoW
Partial	0,3	0,2	0,7	0,7	4,3	0,0	0,3	-0,2	0,1	0,1
Actionable	0,4	0,3	1,2	1,3	8,1	0,0	0,6	-0,3	0,1	0,1
Complete	0,9	0,7	2,5	2,8	17,4	0,0	1,3	-0,6	0,3	0,3
Actionable - LR	0,3	0,3	1,9	1,6	10,3	-0,7	-0,6	-1,8	-0,8	-5,2

Source: own simulation. LR - Long Run.

**TABLE 8 CHANGES (%) IN OVERALL IMPORTS**

scenario	Poland	NMS	Germany	EU15	US	rEurope	Turkey	rAmerica	Asia	RoW
Partial	-0,1	0,0	1,2	0,8	4,8	-0,6	-0,5	-1,6	-0,5	-0,6
Actionable	-0,2	0,0	2,2	1,5	9,1	-1,1	-0,9	-3,1	-1,1	-1,1
Complete	-0,5	0,1	4,8	3,1	19,9	-2,4	-1,8	-6,7	-2,5	-2,4
Actionable - LR	0,1	0,2	2,4	1,7	8,2	-0,9	-1,1	-2,7	-1,3	-8,0

Source: own simulation. LR - Long Run.

The nature of the response in overall imports is also interesting. The increase in US imports is roughly in-line with the increase in its exports. However, while the boost in bilateral trade with the US leads to an increase in overall imports in Germany and the EU-15, the Polish overall imports fall while there is virtually no effect on the overall imports of the NMS. There are some trade diversion effects, mainly stemming from the changes in relative prices that lead to such an asymmetric outcome.

If we observe the relative prices, we can see while the scale of the fall of the aggregate import price is roughly the same for all the EU members, the response of the export prices is not (the detailed tables are placed in the appendix.. Germany is the only trade partner of the analyzed country groupings, where export prices in fact increase. The fall in export prices in the EU15 is also much smaller than the one for Poland and the NMS. While the terms of trade of the EU15 including Germany improves, it significantly deteriorates in Poland and the NMS, which drives the import response.

**TABLE 9 CHANGES IN THE TERMS OF TRADE**

region	Partial	Actionable	Complete	Action-LR
Poland	-0,1	-0,2	-0,4	-0,2
NMS	0,0	-0,1	-0,1	-0,1
Germany	0,2	0,5	1,0	0,3
EU15	0,1	0,3	0,6	0,1
USA	1,0	1,9	3,9	1,3
Rest Europe	-0,3	-0,5	-1,2	-0,2
Turkey	-0,2	-0,4	-0,8	-0,5
America	-0,7	-1,3	-2,7	-0,9
Asia	-0,2	-0,4	-0,9	-0,5
RoW	-0,3	-0,5	-1,1	0,6

Source: own simulation. LR - Long Run.

The limited impact on output exports and imports leads to a moderate effect on welfare as measured by the equivalent variation. The overall gain for Germany and the rest of the EU-15 is in the ballpark of 0.5 percent of the initial value of GDP which is in line with other studies. However, for the NMS including Poland, the overall welfare effect is close to zero. While there certainly is some exports expansion that is welfare improving, the deterioration of terms of trade and the resulting fall in overall exports damps the welfare effect that was expected to be small from the very start, to an even larger extent.

**TABLE 10 WELFARE CHANGES (IN % OF GDP, EQUIVALENT VARIATION)**

scenario	Poland	NMS	Germany	EU15	US	rEurope	Turkey	rAmerica	Asia	RoW
Partial	0,0	0,1	0,2	0,2	0,4	-0,1	-0,1	-0,2	-0,1	-0,1
Actionable	0,1	0,1	0,5	0,4	0,7	-0,3	-0,1	-0,4	-0,2	-0,2
Complete	0,2	0,4	1,2	0,9	1,7	-0,6	-0,2	-0,8	-0,5	-0,5
Actionable - LR	0,1	0,2	0,8	0,6	0,9	-0,2	-0,3	-0,5	-0,4	-6,0

Source: own simulation. LR - Long Run.

Trade between US and EU is focused mainly on manufactured goods. Trade liberalization leads to an overall increase in rents of factors involved in production of those goods. However, while analyzing the pattern of changes across countries one can see some differences that are mostly due to initial relative factor endowments: Germany and the US experience an increase in the real wages of labor and capital as the trade liberalization allows those regions to exploit their comparative advantages. Aside from a smaller scale of overall change, the NMS experience a larger increase of the price of skilled labor to that of capital and of unskilled labour. In Poland, the land rents increase the most while other factors gain relatively less. This is due to the fact that while the output of agriculture is not changing in Poland due to TTIP, it falls in the remaining country groupings involved in the TTIP as most trade moves towards the manufacturing industry. The changes in real wages suggest that while in Poland the manufacturing sector expands as well, the structure of comparative advantage is relatively more shifted towards land-based economic activity than in other EU countries.

**TABLE 11 CHANGES IN REAL FACTOR WAGES (ACTIONABLE SCENARIO)**

factor	Poland	NMS	Germany	EU15	USA	Rest Europe	Turkey	America	Asia	RoW
Land	0,40	-0,50	-5,30	-3,10	-2,30	0,60	0,60	4,00	0,60	0,40
Unskilled Labour	0,10	0,20	0,70	0,60	0,90	-0,20	-0,20	-0,50	-0,20	-0,20
Skilled Labour	0,10	0,30	0,70	0,60	0,90	-0,20	-0,10	-0,50	-0,20	-0,10
Capital	0,10	0,20	0,50	0,50	0,90	-0,20	-0,10	-0,40	-0,20	-0,20
Natural Resources	-1,90	-3,00	-6,20	-3,00	-6,90	-0,30	-0,10	2,90	0,70	-0,10

Source: own simulation.

We provide a more detailed analysis of the response of the simulated Polish economy to the trade policy shock of the TTIP. Table 12 shows the geographic decomposition of Polish exports and imports in the "Actionable" scenario. One can see that the increase in exports and imports to the US is substantial (respectively by 66.2 and 61.3 percent) and contributes to overall 1.7 percentage points increase to both imports and exports. However, at the same time there is a slight exports diversion towards the US from other trading partners, especially Germany and the EU15 that overall corresponds to more than 1 percent of the fall in exports, leading to an overall increase of a mere 0.4 percent.

A similar pattern can be found for Polish imports, where a large boost in imports from the US is dampened by a fall in imports from Polish main trading partners. Here, due to unfavorable developments in terms of trade, the fall in imports from Germany and EU15 combined contributes to over 2 percentage points fall in total exports, which is only partially outweighed by the expansion of transatlantic trade.

TABLE 12 OVERALL IMPORT AND EXPORT CHANGES IN POLAND

Exports	NMS	Germany	EU15	USA	Rest Europe	Turkey	America	Asia	RoW	Overall
% change	-0,1	-2,0	-1,7	66,2	0,0	-0,6	-0,6	-2,1	-0,9	0,4
pp contribution	-0,02	-0,5	-0,6	1,7	0,0	0,0	0,0	-0,1	0,0	0,4
Imports	NMS	Germany	EU15	USA	Rest Europe	Turkey	America	Asia	RoW	Overall
% change	-1,4	-4,4	-3,3	61,3	0,5	2,2	3,1	3,1	0,3	-0,2
pp contribution	-0,1	-1,2	-1,1	1,7	0,0	0,0	0,0	0,4	0,0	-0,2

As far as sectoral composition of trade is concerned, the overall sectoral changes are small (and patterns similar to Table 12 are found also on sectoral level with Poland-EU15 trade shrinking and Poland-US trade expanding). Table 13 show the changes in Polish exports and imports including their contribution to overall export change in the actionable scenario. One can observe, that overall export changes are small. There are some exceptions: exports are expected to go up substantially in the food, wearing apparel, wood, metal products, transport equipment nec and machinery sectors. However, only few of those sectors matter for the overall export change. On the other hand, sectors with largest negative contribution to Polish exports change are metals, motor vehicles and electrical equipment where the fall in exports may reach up to roughly 5 percent. A similar analysis of the change in imports reveals that large imports expansion is expected mostly in the transport equipment nec sector. At the same time, the largest negative contribution to imports is found in motor vehicles, electrical equipment and machinery. In the services sectors, all sectors excluding construction increase exports, while their contribution to overall exports is rather negligible.

The changes in relative prices, exports and imports lead to changes in sectoral output. While these changes are not particularly large, one can observe that sectors that are expanding include mostly textiles, apparel, wood, metal products and machinery— these are the sectors where import reduction accompanies export expansion. Output falls the a largest extent in the metal industry, motor vehicles, transport equipment nec and electrical equipment. Tables 18-20 in the appendix show the detailed bilateral exports and imports changes, as well as the changes in bilateral trade balance. One can see that the TTIP scenarios are indeed largely trade enhancing as far as the bilateral exports and imports with the US are concerned. However, in many production sectors trade expansion between EU15 including Germany and the US is crowding-out Polish exports to the EU-15.

This is especially the case in chemicals, motor vehicles and electrical equipment. Combined with a relatively large expansion in imports from the US this leads to a deterioration in the bilateral trade balance with the US and an overall drop in output. Motor vehicles and chemicals together contribute to overall over 24 percent of Polish exports according to the GTAP database and therefore the negative contribution to welfare gains is substantial. On the other hand, in another important export sector: machinery and equipment sector, the overall effect on trade balances is positive across Polish trading partners, which leads to an increase in output.

TABLE 13 SECTORAL CHANGES IN POLAND'S OVERALL INTERNATIONAL TRADE

Sector	Exports					Imports				
	Partial	Actionable (contribution)	Complete	Action-LR		Partial	Actionable (contribution)	Complete	Action-LR	
Agriculture	-0,5	-1,0	0,0	-2,0	-1,8	0,2	0,3	0,0	0,7	0,6
Mining	-0,6	-1,4	0,0	-3,4	0,7	0,1	0,2	0,0	0,5	0,2
Food	0,8	1,5	0,1	3,4	1,2	0,4	0,5	0,0	0,7	0,7
Textiles	1,6	2,4	0,0	4,6	2,4	0,2	0,3	0,0	0,6	0,4
Apparel	3,1	4,9	0,1	9,9	4,7	0	0	0,0	0,3	0,3
Leather	1,1	1,5	0,0	2,2	1,2	-0,1	-0,2	0,0	-0,3	0
Wood	1,1	2,0	0,1	4,3	1,8	0	-0,1	0,0	-0,1	0,2
Paper	0,9	1,6	0,0	3,3	1,1	-0,3	-0,5	0,0	-0,9	-0,1
Coal Petrol	0,1	0,2	0,0	0,7	0,5	0	0,1	0,0	0,1	-0,1
Chemicals	-0,3	-0,4	0,0	-0,5	-0,8	-0,2	-0,3	0,0	-0,8	-0,1
Minerals	1,2	1,8	0,0	3,3	2,1	-0,3	-0,6	0,0	-1,3	-0,3
Steel	0,6	1,0	0,0	1,6	1,6	-0,1	-0,3	0,0	-0,6	-0,1
Metals	-2,1	-4,8	-0,2	-12,5	-2,0	-0,3	-0,7	0,0	-1,7	-0,4
Metal Products	1,1	2,1	0,1	4,4	1,9	-0,5	-0,8	0,0	-1,6	-0,5
Motor Vehicles	-1,2	-1,6	-0,2	-3,0	-1,5	-0,3	-0,6	-0,1	-1,2	-0,2
Transport Eq. Nec	0,7	1,6	0,0	4,3	0,5	3,9	6,8	0,1	12,2	7,7
Electrical Eq.	-1,9	-4,2	-0,2	-9,3	-4,1	-0,5	-1	-0,1	-2,1	-0,5
Machinery	1,0	1,7	0,2	3,2	1,4	-0,3	-0,5	-0,1	-1	0,1
MntcsNec	1,1	1,5	0,0	2,5	1,6	-0,1	0	0,0	0,3	0,2
Utilities, Energy	0,5	0,8	0,0	1,9	1,0	-0,9	-1,7	0,0	-3,7	-1,1
Construction	0,1	-0,1	0,0	-0,3	-1,6	-0,3	-0,5	0,0	-1,1	0
Trade	0,8	1,5	0,0	3,2	1,1	0	0,1	0,0	0,3	0,1
Transport	0,6	1,1	0,0	2,4	0,6	0,3	0,8	0,0	1,6	0,6
Communication	0,4	0,6	0,0	1,3	0,9	0	0,1	0,0	0,2	-0,2
Fin. Svcs	0,1	-0,1	0,0	0,1	-0,6	-0,1	-0,1	0,0	-0,1	0
Insurance	0,6	1,0	0,0	2,1	0,6	0	0,2	0,0	0,5	0,1
Business Svcs	0,9	1,5	0,1	3,2	1,1	-0,5	-0,8	0,0	-1,7	-0,5
Recreation, Nec	0,8	1,4	0,0	2,9	0,7	-0,1	-0,1	0,0	-0,1	0,1
Non-market Svcs	1,1	1,9	0,0	3,9	1,2	-0,4	-0,5	0,0	-0,9	-0,6

Source: own simulation. LR - Long Run.

Contribution in percentage points to overall change in exports/imports.



TABLE 14 OUTPUT CHANGES IN POLAND

Sector	Partial	Action	Complete	Act - LR
Agriculture	0	0	0,1	-0,1
Mining	-0,1	-0,3	-0,9	0,1
Food	0,1	0,2	0,6	0,2
Textiles	1,1	1,7	3,3	1,7
Apparel	0,9	1,4	2,8	1,4
Leather	0,4	0,5	0,6	0,4
Wood	0,7	1,3	2,9	1,3
Paper	0,3	0,5	0,9	0,4
Coal Petrol	0,1	0,2	0,5	0,2
Chemicals	-0,1	-0,1	0,1	-0,1
Minerals	0,2	0,3	0,5	0,6
Steel	0,3	0,5	0,8	0,9
Metals	-1,3	-2,9	-7,8	-1,2
Metal Products	0,3	0,6	1,3	0,7
Motor Vehicles	-0,9	-1,3	-2,5	-1,2
Transport Eq. Nec	-2,3	-4,2	-7,8	-4,5
Electrical Eq.	-1,3	-3	-6,8	-2,8
Machinery	0,3	0,4	0,6	0,5
MnfcNec	0,2	0,2	0,3	0,4
Utilities, Energy	0	0,1	0,2	0,2
Construction	-0,2	-0,4	-0,8	0,2
Trade	0	0,1	0,3	0,2
Transport	0,1	0,2	0,5	0,1
Communication	0	0	0,1	0,2
Fin. Svcs	0	0	0	0,1
Insurance	0	0	0,1	0,2
Business Svcs	0	0,1	0,2	0,2
Recreation, Nec	0	0,1	0,2	0,2
Non-market Svcs	0	0	0,1	0,1

Source: own simulation. LR - Long Run.

## CONCLUSIONS

In this paper we have used a computable general equilibrium model to assess the possible effects of the international trade part of the TTIP on the economy of Poland. We have used the country-specific estimates of the tariff equivalents of non-tariff barriers both in services and merchandise trade, which have proved to exhibit some important differences in selected sectors. Our simulation scenarios assume complete tariff liberalization plus a partial liberalization of NTBs.

Our results show that the overall effects of the TTIP for the EU as a whole will be similar to those found in other empirical studies using similar methodology. However, we show that there is a clear asymmetry of results, as far as individual countries are concerned. First, the gain in Poland and the New Member States of the EU is

considerably smaller than that in the western part of the EU. Second, the German gains from TTIP stand out from all analysed regions. TTIP is in fact an across-the-board trade liberalization, in spite of some sectoral differences. In such cases, the existing pattern of comparative advantage gets amplified by CGE models. Therefore large US trading partners (such as Germany) will naturally gain more than small ones (such as Poland and other NMS).

However, we also see some other changes in the pattern of trade. First of all, we observe some trade diversion: while trade between Poland and US goes up substantially, what is disturbing is the reduction of trade with the EU. The main cause of is the unfavorable change in terms of trade: it deteriorates in Poland, mainly through a relative increase in the imports prices. This is mainly caused by a shift of resources in Germany and the EU15 towards the production of US-destinated goods and a increase in the cost of Polish imports from those partners. While a decrease in terms of trade has a direct negative welfare effect, one has to keep in mind that production in Poland is import intensive and this unfavorable change in the terms of trade indirectly affects the competitiveness of Polish exports. Together with the negative initial trade balance with the US in many sectors, some important export-oriented sectors reduce exports and subsequently output. With moderate direct gain of 0,2% in output in the central simulation scenario, the terms-of-trade effect brings down the overall gain in welfare in that scenario to just 0,1% of GDP.

While the overall effects are small for Poland to the extent of being almost negligible, one has to keep in mind that some sectoral reallocations are likely to happen across sectors and this may have non-zero effects depending on wage rigidity and labour market flexibility. Moreover, simulations as the one presented in this paper are subject to certain risks both on the part of modelling and simulation scenarios. One that comes to one's mind is the level of initial NTBs and the scope of their liberalization: however, as those barriers include all the possible determinants of bilateral trade that are not captured by gravity variables, these might be overestimated – therefore reducing the overall impact. This is probably not the case for agriculture, where trade is generally protected in many countries and the underlying econometric model may not be able to assess the benchmark “free trade” levels. A deeper liberalization in agriculture may lead, however, to an amplification of the differences between Poland and other economies, due to the relative structure of Polish factor endowment. Another source of uncertainty is the treatment of the intermediate goods in the GTAP model: the GTAP database does not structurally distinguish trade in intermediates with the trade in final goods. Therefore the effects of the EU-15 trade expansion on the output of Poland's production of intermediate goods may be underestimated. This is a promising avenue for further research.

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## APPENDIX: ADDITIONAL TABLES

**TABLE 15 CHANGES IN IMPORT PRICES**

scenario	1 Poland	2 rNMS	3 Germany	4 rEU15	5 USA	6 rEurope	7 Turkey	8 rAmerica	9 Asia	10 ROW
Partial	-0,2	-0,2	-0,2	-0,2	-0,5	-0,2	-0,3	-0,1	-0,4	-0,3
Actionable	-0,3	-0,4	-0,4	-0,3	-0,9	-0,4	-0,6	-0,3	-0,8	-0,6
Complete	-0,7	-0,8	-0,8	-0,7	-1,9	-1,0	-1,3	-0,7	-1,7	-1,3
Actionable - LR	-0,2	-0,3	-0,3	-0,2	-0,6	-0,3	-0,3	-0,2	-0,4	-0,3

Source: own simulation. LR - Long Run.

**TABLE 16 CHANGES IN EXPORT PRICES**

scenario	1 Poland	2 rNMS	3 Germany	4 rEU15	5 USA	6 rEurope	7 Turkey	8 rAmerica	9 Asia	10 ROW
Partial	-0,3	-0,3	0,0	-0,1	0,5	-0,5	-0,5	-0,8	-0,6	-0,5
Actionable	-0,6	-0,5	0,1	-0,1	0,9	-1,0	-1,0	-1,5	-1,2	-1,1
Complete	-1,2	-0,9	0,2	-0,1	1,9	-2,1	-2,1	-3,3	-2,6	-2,4
Actionable - LR	-0,5	-0,4	0,0	-0,1	0,6	-0,5	-0,8	-1,0	-0,9	0,3

Source: own simulation. LR - Long Run.

TABLE 17 OUTPUT CHANGES, ACTIONABLE SCENARIO

Sector	Poland	NMS	Germany	EU15	US	rEurope	Turkey	rAmerica	Asia	RoW
Agriculture	0,0	-0,1	-1,3	-0,8	-0,6	0,1	0,2	0,8	0,1	0,1
Mining	-0,3	-0,6	-1,0	-0,5	-1,1	0,0	-0,1	0,4	0,1	0,0
Food	0,2	-0,2	-0,5	0,2	-0,1	0,2	0,1	0,5	0,1	0,1
Textiles	1,7	1,9	-0,4	1,5	-4,0	1,0	1,4	1,3	0,5	0,2
Apparel	1,4	2,7	-0,8	3,3	-3,3	0,8	1,4	0,1	0,2	-0,1
Leather	0,5	2,7	1,4	5,5	-8,6	1,5	0,9	0,7	-1,9	0,6
Wood	1,3	0,8	-1,4	-0,5	-0,8	1,0	0,7	3,1	0,8	0,3
Paper	0,5	0,4	-0,6	-0,2	-0,9	1,2	0,6	1,4	0,5	0,5
Coal Petrol	0,2	0,3	0,1	0,6	0,2	0,0	0,1	0,1	0,0	0,0
Chemicals	-0,1	0,2	-1,8	-0,4	-0,9	0,0	0,6	0,8	0,3	0,3
Minerals	0,3	0,2	-0,3	0,3	-1,4	-0,1	-0,7	-1,1	-0,5	-0,4
Steel	0,5	0,8	-0,7	-0,4	-4,1	0,6	0,3	-0,2	-0,1	0,1
Metals	-2,9	-3,6	0,7	-1,4	2,7	-3,2	-1,8	-2,3	-0,2	-2,0
Metal Products	0,6	0,4	0,1	0,0	-1,3	1,2	0,5	0,2	-0,1	0,1
Motor Vehicles	-1,3	-0,5	3,1	0,4	-0,2	0,0	0,2	-2,6	-0,7	-0,1
Transport Eq. Nec	-4,2	-6,5	-5,3	-1,3	1,6	-2,3	-4,3	-3,8	-0,6	-1,3
Electrical Eq.	-3,0	0,1	-1,4	-0,4	-0,7	-0,7	-0,8	1,7	-0,3	-0,1
Machinery	0,4	0,1	1,4	0,7	-3,1	0,1	0,7	-2,1	-0,1	0,8
MnfcsNec	0,2	0,5	-1,6	0,5	-0,4	0,5	0,0	0,5	0,3	-0,3
Utilities, Energy	0,1	0,1	-0,5	-0,1	0,0	0,3	0,1	0,2	0,0	0,0
Construction	-0,4	-0,4	0,6	0,1	1,5	-0,8	-1,1	-1,8	-0,9	-1,0
Trade	0,1	0,1	-0,1	0,1	0,3	-0,1	-0,1	-0,2	0,0	-0,1
Transport	0,2	-0,1	-0,5	-0,2	0,0	0,1	-0,1	0,3	0,2	0,0
Communication	0,0	0,0	-0,2	-0,3	0,2	0,2	0,1	0,2	0,2	0,2
Fin. Svcs	0,0	-0,2	-0,5	-0,7	0,3	0,3	0,1	0,3	0,2	0,2
Insurance	0,0	0,0	0,0	0,4	-0,5	0,3	0,6	1,0	0,3	0,3
Business Svcs	0,1	0,1	-0,1	-0,1	-0,3	0,4	0,1	0,4	0,4	0,3
Recreation, Nec	0,1	0,1	0,0	-0,1	0,6	0,2	0,3	0,3	0,1	0,2
Non-market Svcs	0,0	0,1	0,1	0,1	0,2	0,0	0,0	0,0	0,0	0,0

Source: own simulation.

**TABLE 18 BILATERAL CHANGES IN POLAND, ACTIONABLE SCENARIO**

sectr	NMS	Germany	EU15	USA	Rest Europe	Turkey	America	Asia	RoW
Agriculture	-0,9	-1,9	-1,8	100,1	-0,8	-0,7	-0,1	-1,2	-1,8
Mining	-2	-1,5	-0,9	186	-1,6	-1,2	-2,3	-1,8	-1,3
Food	-0,9	0,9	0,6	59	-0,8	-0,8	-1,6	-2,1	-1,9
Textiles	1,9	-1,5	0,2	189,5	-1	-1,7	-2,3	-3,9	-3,8
Apparel	0,6	-0,7	-0,2	352,4	-1,4	-3	-5,6	-4,5	-3,9
Leather	2	0,4	0,8	247,6	-1	-2,1	-6,2	-4,5	-3,8
Wood	0,9	0,8	0,7	64,5	0,6	-1,3	-1,8	-3,3	-2,8
Paper	1,7	1,4	1	88,5	0,9	0,5	-0,3	-1,8	-1,1
Coal Petrol	0	0,3	0,2	26	0,1	-0,1	-0,1	-0,2	-0,2
Chemicals	0,8	-3,1	-2,3	54	0,9	0,2	-0,5	-2,1	-1,2
Minerals	0,1	-1,8	0,6	81,1	-0,8	-1,7	-3,2	-3,1	-2,5
Steel	0,4	1,5	0,2	66,5	-1,1	-0,6	-3,1	-3,2	-2,5
Metals	-2,1	-6,2	-11,7	173,8	-3,8	-3,5	-4,7	-4,5	-4,2
Metal Products	1,2	-0,4	-0,4	135,7	0,3	-0,6	-2,5	-3,9	-2,8
Motor Vehicles	-1,4	-5	-0,9	79,9	-1,2	-0,5	-2,2	-2,7	-1,9
Transport Eq. Nec	-7,4	-10,7	-12,8	80,5	2,8	4,3	2,8	4,2	3,6
Electrical Eq.	-1,7	-10,7	-6,2	218,9	-0,2	-2	-2,6	-3,4	-1,9
Machinery	0,2	-3,1	-3,8	111,8	0,3	-0,6	0,4	-3	-0,4
MntcsNec	0,5	-0,1	-3,2	51,6	-0,3	-2,2	-3,4	-3,6	-2,7
Utilities, Energy	0,7	2,3	2,3	3,7	-0,4	-2,4	-3	-2,1	-1,9
Construction	-1,1	0,7	-0,5	44,1	-1,8	-2,7	-3	-1,9	-1,7
Trade	0,2	1,6	1,1	26,9	-0,7	-0,9	-2,1	-1,8	-0,7
Transport	-1,7	-1	-0,9	18,2	-0,2	-0,5	-1,3	-0,6	-0,3
Communication	-0,1	0,6	0,8	6,4	-0,3	-0,7	-1,2	-0,9	-0,5
Fin. Svcs	-0,9	-0,5	-1,7	8,3	0,6	0,3	0	0,1	0,4
Insurance	-0,6	1	0,7	12,4	-0,1	-0,3	0,2	-0,5	0,1
Business Svcs	0,7	1,8	1,5	12,5	0,4	-1	-1,8	-0,7	-0,2
Recreation, Nec	0,3	2	1,3	10,1	-0,3	0,1	-0,7	-0,6	0,1
Non-market Svcs	1,2	2,7	3	2,2	-0,2	0,4	-0,4	0,1	0,8

Source: own simulation. LR - Long Run.

**TABLE 19 BILATERAL IMPORT CHANGES IN POLAND, ACTIONABLE SCENARIO**

sectr	NMS	Germany	EU15	USA	Rest Europe	Turkey	America	Asia	RoW
Agriculture	-0,5	-2,6	-2,3	67,9	1,2	1,7	2,9	2,3	2,1
Mining	-1,4	-3	-7,5	199,4	-0,3	0,2	-0,5	-0,4	0
Food	-1,6	-4,6	-3,7	180,1	0,9	1,3	4,2	2,1	1,7
Textiles	0	-3,6	-2,6	146,7	3,4	4,4	9,3	6	5,1
Apparel	-1,2	-4,8	-4,1	243	2,7	3,4	9,1	5,1	4,3
Leather	-1	-5	-4,1	164,4	3,2	3,8	10,5	5,6	4,9
Wood	0,7	-3,8	-2,2	90,3	3,6	4,4	9,1	5,8	5,1
Paper	-0,3	-4,5	-3,2	87,7	2,9	3	7,7	4,5	3,8
Coal Petrol	0,2	-0,4	-0,4	5,5	0,4	0,5	1,5	0,6	0,5
Chemicals	-0,2	-3,3	-2,3	65,1	2,5	2,6	7,2	4,3	3,6
Minerals	0,1	-3,6	-2,5	87,1	3	3,2	7,6	4,2	3,7
Steel	0,3	-2,9	-1,8	111,6	3,1	2,7	7,3	4,4	3,8
Metals	-1,7	-4,3	-1,8	215	1,6	2	7	3,4	2,8
Metal Products	-0,1	-4,8	-3	102,5	3,8	3,9	10,1	5,9	4,9
Motor Vehicles	-1,3	-2,9	-2,7	148,2	0,5	0,9	3,6	2,4	1,3
Transport Eq. Nec	-26,8	-29,4	-28	43,5	-25,6	-25	-21,5	-23,8	-24,8
Electrical Eq.	-3,2	-6,7	-5,7	113,7	-0,1	0,6	6,5	2,1	1,3
Machinery	-2,1	-6	-4,7	90,4	1,7	2	7,7	4	2,8
MntcsNec	-1	-5,9	-3,6	82,8	3,2	3,6	9,5	5,3	4
Utilities, Energy	1	-3,1	-2,1	-8,4	4,3	4,5	8,9	5,5	4,7
Construction	-0,7	-3,1	-2,7	44,5	1,5	1,8	4,9	2,6	1,9
Trade	-1,1	-4,8	-3,3	47,6	1,2	1,4	4,9	2,3	1,6
Transport	-4,1	-6,1	-5,2	37	-2,6	-2,4	0,3	-1,7	-2,3
Communication	-1,5	-4,4	-3,7	20,3	1	1,3	4,7	2,2	1,5
Fin. Svcs	-1,6	-4,8	-3,6	22,6	1	1,1	4,9	2,1	1,5
Insurance	-1,4	-4,5	-3,4	18,2	1,3	1,4	4,9	2,3	1,7
Business Svcs	-0,2	-3,4	-2,6	7,1	2,3	2,6	6,4	3,5	2,9
Recreation, Nec	-1	-4,2	-3,3	14	1,4	1,6	5,3	2,6	1,8
Non-market Svcs	0	-3,2	-2,4	-7,6	2,8	3	6,8	4	3,2

Source: own simulation. LR - Long Run.

**TABLE 20 BILATERAL TRADE BALANCE CHANGES IN POLAND, ACTIONABLE SCENARIO**

sectr	NMS	Germany	EU15	USA	Rest Europe	Turkey	America	Asia	RoW
Agriculture	-0,2	0,1	0,8	-39,1	-1,0	-1,7	-2,7	-2,0	-2,1
Mining	-0,8	-1,0	2,9	-193,8	0,3	-0,2	0,4	-0,4	-0,1
Food	-0,3	2,3	1,9	-1,2	-0,8	-0,9	-3,7	-2,1	-1,8
Textiles	1,0	1,8	1,9	40,6	-1,5	-4,3	-5,2	-6,0	-4,8
Apparel	0,8	1,3	1,7	295,0	-1,6	-3,4	-6,8	-5,1	-4,0
Leather	1,5	3,3	3,4	-2,7	-1,5	-3,6	-10,4	-5,6	-4,4
Wood	0,5	1,4	1,0	58,1	-0,1	-2,2	-3,4	-5,2	-3,0
Paper	1,1	3,3	2,5	-56,8	0,4	-0,1	-2,3	-3,5	-1,3
Coal Petrol	-0,1	0,4	0,3	3,7	-0,3	-0,2	-1,3	-0,4	-0,5
Chemicals	0,5	1,5	1,0	-28,9	-0,6	-0,9	-3,1	-3,7	-2,6
Minerals	0,0	1,4	1,5	51,4	-1,1	-2,5	-4,8	-3,9	-2,6
Steel	0,1	2,3	1,3	19,6	-2,5	-1,7	-3,4	-4,2	-2,7
Metals	-0,8	-1,2	-5,1	50,6	-2,2	-2,9	-6,8	-4,3	-2,9
Metal Products	0,8	2,4	1,3	54,8	-0,4	-2,6	-4,8	-5,7	-3,1
Motor Vehicles	-0,3	-0,5	0,6	-77,9	-1,2	-0,7	-3,1	-2,5	-1,8
Transport Eq. Nec	16,4	-2,4	-3,5	-22,9	6,9	4,4	8,1	18,2	12,6
Electrical Eq.	1,8	2,8	-1,6	-45,4	-0,1	-1,6	-5,1	-2,1	-1,6
Machinery	1,1	2,8	1,2	3,1	-0,3	-1,2	-2,0	-3,9	-1,2
MntcsNec	0,7	3,3	0,9	21,3	-0,8	-3,4	-5,9	-5,2	-3,0
Utilities, Energy	0,5	3,0	2,2	4,9	-3,5	-4,5	-5,2	-4,1	-2,9
Construction	-0,6	1,5	0,8	32,4	-1,7	-2,2	-3,5	-2,3	-1,7
Trade	0,7	2,7	2,5	-10,1	-1,0	-1,3	-3,8	-2,2	-1,3
Transport	1,1	1,0	2,0	-3,8	1,0	2,0	-0,8	1,0	0,9
Communication	0,9	2,3	2,4	-12,6	-0,7	-1,2	-3,6	-1,7	-1,2
Fin. Svcs	0,3	1,1	2,2	-11,8	-0,5	-1,0	-3,5	-1,5	-0,7
Insurance	0,2	3,1	2,6	-8,8	-0,7	-1,4	-4,2	-1,9	-1,1
Business Svcs	0,5	2,5	2,1	1,1	-0,8	-1,9	-3,9	-1,8	-1,1
Recreation, Nec	0,6	2,5	2,3	-2,6	-0,6	-1,5	-3,1	-1,9	-1,0
Non-market Svcs	0,6	2,9	2,6	6,6	-1,9	-1,3	-5,3	-3,3	-1,9

Source: own simulation. LR - Long Run. Trade balance changes expressed as  $100 \cdot (dX - dM) / (X + M)$





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