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THE LIBERALISATION OF AGRICULTURAL TRADE AS PART OF THE WTO VS THE POSSIBILITIES OF DEVELOPMENT OF THE POLISH FOREIGN TRADE IN AGRI-FOOD PRODUCTS

1. Introduction

Of the numerous factors determining the level and structure of the world agricultural trade it is the processes of liberalisation of foreign exchange that deserve special attention. So far the most important decision concerning the access to the market, domestic support and export subsidies were made during the Uruguay Round GATT/WTO. *The Agreement on Agriculture*, which was negotiated then, started the process of reforms in agricultural trade and national agrarian policies aiming at the liberalisation of turnover between the signatories of the Agreement. Its further course was to have been agreed on during further negotiations. However, the new mandate of agricultural negotiations was passed only in six years following the end of the Uruguay Round, at the Ministerial Conference in Doha in November 2001. The end of the agricultural negotiations, which had thus begun and passing detailed decisions and the final agreement were expected to take place at the Ministerial Conference in Hong Kong, which was planned for December 2005. Due to the divergent negotiation stands taken by the main "players" in the Round the plan has not been realised yet. The aim of the article is to define the possibilities of development of trade exchange in the Polish agri-food sector in the conditions of potential liberalisation of the world agricultural trade and absence of further action taken in this direction.

2. Research method

The mathematical model of general equilibrium *Global Trade Analysis Project* (GTAP)[1] was used in the research. The models of general equilibrium are based on the neoclassical assumption that the prices of products, services and production factors run freely on the market and balance the demand and supply [Shoven, Whalley 1984]. The main point of such models is the premise that in a long period the economy develops in consequence of constant adjustments of the demand and supply, which take place as a result of changes in the structure of the prices of products and production factors running freely, which informs consumers of the costs of production of particular products and services and which forces manufacturers to allocate the production factors according to the consumers' decisions [Devarajan, Go 1998; Orłowski 2000; Robinson, Roland-Holst 1988]. This means that the models of general equilibrium are based on restrictive assumptions concerning the rationality of entities' behaviour and flexibility of markets.

The GTAP model, which was used in the research, was built by T.W. Hertel in 1992 and it is successively developed.[2] The model database comprises 113 regions characterised by the open economy structure (Figure 1) and 57 sectors (groups of products or products) of national economies.[3]

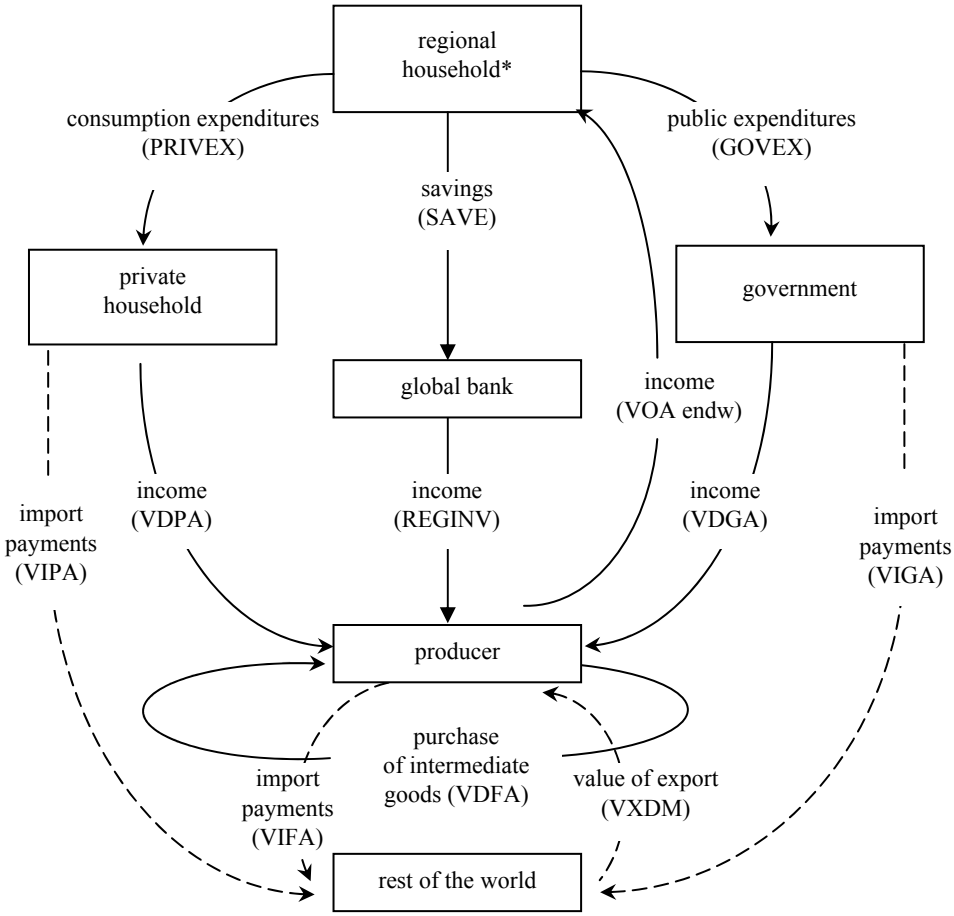
The budget of a region with closed economy, i.e. not connected with the world economy with the streams of trade exchange, is allocated between private consumption expenditures (PRIVEX), public expenditures (GOVEX) and savings (SAVE). The only source of income for regional households is from the "sale" of endowment commodities to firms. This income flow is represented by VOA endw which denotes Value of Output at Agents' prices of endowment commodities. Firms

[1] Besides the models of general equilibrium the models of partial equilibrium are also distinguished. The latter describe the analysed problem or market in separation from the rest of the economy, which enables thorough research, but causes certain doubts when generalising the conclusions. On the other hand, the former treat the economy as a whole and allow for the interbranch flow, but they are less detailed than the models of partial equilibrium. In order to achieve a coherent and complete image of production feedback, income, consumption and increase in the mid-term and long-term perspective the models of general equilibrium are widely used.

[2] Thomas W. Hertel is a professor at the Department of Agricultural Economics, Purdue University, USA and executive director at the Center for Global Trade Analysis, which works at the University.

[3] See [Narayanan, Walmsley (eds.) 2008]. For analyses it is possible to assume the aggregation suggested by the author of the model or other users, or to create one's own aggregation adjusted to the needs of the conducted research. The analysis uses an original aggregation of groups of products and countries around the world. The following product categories are distinguished: cereals, fruit and vegetables, oil seeds, vegetable fats and oils, sugar, meat, offal and meat products, dairy products, other plant raw materials, other non-processed animal products, other food products, other products and services. The components of the distinguished groups of products were assumed as GTAP Data Base 7.0. The aggregation of countries came down to three groups, i.e. Poland, the other European Union countries (EU-26) and other countries of the world.

combine these endowment commodities with intermediate goods (VDFA = Value of Domestic purchases by Firms at Agents' prices) in order to produce goods form final demand. This involves sales to private households (VDPA = Value of Domestic purchases by Private households at Agents' prices), government households (VDGA = Value of Domestic purchases by Government household at Agents' prices), and the sale of investment goods to satisfy the regional household's demand for savings (REGINV) [Hertel, Tsigas 1997].



* total budget of private entities and public sector institutions in the region comprised by the GTAP database; in brackets original English names used in the GTAP model are given; solid lines refer to circulation in closed economy; dashed lines mark the flow related with the opening of the economy.

Figure 1. Multiregion open economy without government intervention

Source: based on [Hertel, Tsigas 1997].

In the open economy model the domestic economy starts trade exchange, as a result of which trade partners appear in the structure of the model. They are a source of import for the domestic economy and at the same time they are the destination for exports (VXDM = Value of eXports at Market prices by Destination). It is important to note that imports are traced to specific agents in the domestic economy, resulting in distinct import payments to rest of the world from private households (VIPA), government households (VIGA), and firms (VIFA) [Hertel, Tsigas 1997].

The use of the model for forecasting the development of trade exchange consists in constructing simulation scenarios and determining the influence of simulated exogenous variables on the volume of import and export of specific products (groups of products or sectors of domestic economies). Before the realisation of the research plans simulation scenarios were formulated, where the exogenous variables were: the population, GNP value and the production volume of basic farm products in Poland, in the other countries of the European Union (EU-26) and in other countries around the world, productivity of land resources and labour in Polish agriculture and in the EU countries (Table 1) and the value of customs tariffs and export subsidies in the world agricultural trade.[4]

As far as the liberalisation of the foreign exchange is concerned, there were two simulation variants differing in the degree of reduction of customs tariffs. In the first variant a reduction of customs tariffs was assumed, which resulted from the last stage of negotiations at the WTO forum[5] and a total abolishment of all subsidies in the agri-food export. In the second variant the absence of further liberalisation of trade exchange was assumed.[6] A band formula of customs tariffs reduction was applied,[7] which provides for division of all tariffs into four reduction bands, depending on their value. For each of the bands a different reduction coefficient is to be applied – the higher the level of customs tariffs, the higher the coefficient (Table 2). The extrapolation of values of trade turnover in the Polish agri-food sector was made by means of Gragg's nonlinear estimation.[8]

[4] The construction of the GTAP model requires an estimation of the dynamics of the planned variables and entering them into the model in the relative approach. 2007 was assumed to be the base year.

[5] See [*Revised Draft Modalities*…. 2008].

[6] For the results of research allowing for earlier negotiation stands of the chief "players" of the Doha Round (EU, USA, developing countries group G-20) see [Poczta, Pawlak 2008].

[7] The reductions apply to the tariffs of the Most Favoured Nation (MFN) Clause. In the process of implementation of the reduction commitments WTO members will have the right to introduce a smaller reduction of duties for the so-called "sensitive goods" than the one resulting from the band reduction formula. Due to the absence of lists of sensitive goods the analysis does not discuss the problem.

[8] Non-linear estimation is a general adjustment procedure which is used for the estimation of any type of dependence between the dependent variable (being discussed) and independent variables. Estimation errors in this method are smaller than in the case of linear estimation.

Table 1. The population, GNP, production of basic farm products and productivity of land resources and labour in agriculture in Poland, the EU-26 countries and in other countries around the world in 2007 and the forecast for 2015

Specification		Unit	2007	2015	
			Absolute values		2007=100
Poland	Population	people (in millions)	38.1	37.6	98.7
	GNP	USD (in billions)	420.3	577.8	137.5
	Cereals production	tons (in millions)	27.1	26.4	97.4
	Oil seeds production	tons (in millions)	2.1	1.7	81.0
	Meat production	tons (in millions)	3.6	3.6	100.0
	Milk production	tons (in millions)	12.1	12.4	102.3
	Land productivity	USD (in thousands)/ha	1.7	1.9	114.7
	Labour productivity	USD (in thousands) /head	12.1	12.9	106.3
Other EU countries	Population	people (in millions)	457.0	460.2	100.7
	GNP	USD (in billions)	16,472.6	19,390.2	117.7
	Cereals production	tons (in millions)	230.6	275.6	119.5
	Oil seeds production	tons (in millions)	20.1	23.1	114.9
	Meat production	tons (in millions)	40.1	41.0	102.2
	Milk production	tons (in millions)	135.9	139.0	102.3
	Land productivity	USD (in thousands)/ha	2.8	3.0	108.0
	Labour productivity	USD (in thousands) /head	46.1	52.4	113.7
Other countries	Population	people (in millions)	6,116.9	6,786.8	111.0
	GNP	USD (in billions)	37,454.1	50,770.5	135.6
	Cereals production	tons (in millions)	1,963.4	1,885.5	96.0
	Oil seeds production	tons (in millions)	369.3	297.1	80.4
	Meat production	tons (in millions)	229.2	238.0	103.8
	Milk production	tons (in millions)	505.8	513.8	101.6

Source: [*Agriculture in the European Union*... 2009; *FAPRI 2008*...; *Prospects for agricultural markets*... 2009; *World Agriculture*... 2006; *Rynek zbóż*... 2008; *Rynek rzepaku*... 2008; *Rynek mięsa*... 2008; *Rynek mleka*... 2008; http://www.fao.org; http://web.worldbank.org/; http://epp.eurostat.ec.europa.eu/]; the author's calculations.

Table 2. Average bound MFN rates and the formula of customs tariffs reduction for the analysed groups of products according to the provisions of the Doha Round

Product groups	Average bound MFN rate*	Customs tariff reduction forecast (%)
Cereals	41.5	57.0
Fruit, vegetables	16.0	50.0
Oil seeds	0.0	0.0
Vegetable oils and fats	13.1	50.0
Sugar	150.2	70.0
Meat, offal, and meat products	38.2	57.0
Dairy products	70.9	64.0
Other plant raw materials	23.1	57.0
Other non-processed animal products	29.8	57.0
Other food products	20.4	57.0

* arithmetical average for the subitems of the Combined Nomenclature charged with a customs tariff; for specific duties the *ad valorem* equivalent was calculated.

Source: the author's work based on the Common Customs Tariff and [*Revised Draft Modalities*... 2008].

3. The prospects of development of the Polish foreign trade in agri-food products

As results from the projections, in the years 2007-2015 the income from the export of agri-food products from Poland may rise up to 16% if the new agricultural agreement is implemented (variant 1) or to 27% if no further liberalisation of the foreign exchange is assumed (variant 2), and reach the values of $15.8 billion and $17.4 billion respectively (Table 3). At the same time import expenditures may rise by about 32% and reach the value of $14.4 billion in the conditions of progressing liberalisation of agricultural turnover (variant 1) or by slightly more than 25%, up to the value of $13.8 billion if no further reduction of customs tariffs takes place (variant 2).

Table 3. Polish foreign trade in agri-food products in 2007 and the forecast for 2015

Specification	2007	2015	
	USD (in millions)		2007=100
Variant 1 – Liberalisation of trade			
Export	13,661.8	15,860.1	116.1
Import	10,908.7	14,374.4	131.8
Balance	2,753.1	1,485.7	54.0
Variant 2 – No further liberalisation of trade			
Export	13,661.8	17,400.3	127.4
Import	10,908.7	13,768.2	126.2
Balance	2,753.1	3,632.1	131.9

Source: [*Polski handel zagraniczny*... 2008], GTAP simulations, the author's calculations.

The likelihood of achieving the simulated values of trade turnover in 2015 seems to be confirmed by the results of trade in agri-food products until 2008 and the falling increase in the dynamics of trade exchange which has been observed since Poland's accession to the EU. According to the data of the *Foreign* Agricultural Markets Monitoring Unit of the Foundation of Assistance Programmes for Agriculture (FAMMU/FAPA) the export value of agri-food products from Poland in 2008 was €11.3 billion ($16.5 billion[9]), whereas the import value reached €9.8 billion ($14.3 billion) [*Analiza wybranych zagadnień*... 2009]. Besides, after the increase of over 36% in the income from export in 2005 as compared with 2004, in 2006, 2007 and 2008 the export increase dynamics was slightly over 21%, nearly 28% and about 21% respectively in comparison with the previous years [*Polski handel zagraniczny*... 2007, *Analiza wybranych zagadnień*... 2009].

[9] The values were calculated according to the average yearly dollar to euro exchange rate on the basis of the data of the National Bank of Poland [http://www.nbp.pl, 21 April 2009].

It is possible to say that the convergence of prices of agri-food products in Poland and other European Union countries[10] and the possible appreciation of the złoty on the monetary market may result in lower competitiveness of the prices of products exported from Poland and in consequence, a reduced rate of the increase in their sale abroad. Until now the dynamic increase in the value of agri-food exports has been based chiefly on the cost-price advantage taken by Polish exporters on the Single European Market. However, further export development on the same basis may be difficult. The advantage related with lower costs and prices than in the other EU countries has decreased and in some branches of farming production it has been exhausted. Besides, Polish farmers have to face the more aggressive competition of producers from other member states of the EU, especially the Czech Republic, Hungary, Romania and Bulgaria and in the case of progressing liberalisation of agricultural trade they need to face the competition of other countries. They frequently have the competition advantage resulting from the scale of production[11] or natural resources (natural and climate rent). This may cause the production of some agricultural raw materials in Poland to be uncompetitive.

It is also necessary to take into consideration the fact that the exchange rate of the euro to the dollar will be extremely significant for the results of the forecast. The currency of the model is the dollar, but Poland exports over ¾ of agri-food products to the euro zone. A possible appreciation of the dollar to the euro may thus contribute to stabilisation or even lowering of the current value of the Polish export of agri-food products expressed in dollars. It is also worth emphasising that the use of upcoming export possibilities largely depends on the acceptance of Polish products by the food industry and trade and by foreign consumers. At present the acceptance can be noticed mainly in trade and industry. The final consumers' positive reception of Polish agri-food products may guarantee an increase in their sale abroad and a higher added value in export.

The falling dynamics of trade turnover increase was also observed in import. In the second year of Poland's membership in the EU the expenditures on purchasing foreign food increased by 25% and in the third year by about 19% as compared with the previous years. In fact the tendency was broken in 2007 and 2008 when the import value increased by 35% and 31% respectively in comparison with the previous years [*Polski handel zagraniczny*... 2007; *Analiza wybranych zagadnień*... 2009]. However, the forecasts suggest a clear acceleration in the tendency to limit

[10] The EU countries are Poland's chief trade partner in the food and farming sector. In 2008 on the Single European Market (SEM) about 80% of the total export of food and farming products was placed and nearly 70% of the imported food came from there [*Analiza wybranych zagadnień*... 2009].

[11] These advantages are much more durable than technological advantages, for example. Structural transformations in agriculture and in consequence changes in the scale of production usually take place in a long or very long period of time [Rowiński 2003].

import expenditures and the value of import of agri-food products reaching a comparable (simulation variant 1) or lower (variant 2) level in 2015 than in 2008.

On the basis of the conducted research it is possible to show that improvement in the trade turnover balance in the agri-food sector can only be expected if the pursuit of liberalisation of world agricultural trade is abandoned. The implementation of liberalisation propositions negotiated at the WTO forum may result in the value of the surplus of the trade balance in the agri-food sector dropping from $2.8 billion in 2007 to $1.5 billion in 2015, i.e. by about 45% (Table 3).

It is necessary to note that variant 2 of the simulation, which is based on the assumption of absence of further liberalisation of foreign exchange, indicates higher export values and simultaneously lower import values of agri-food products from/to Poland. Hence, it is possible to conclude that the lowering of the protection level of the EU domestic market, whose integral part the Polish market is, will lead to Poland's increased import of agri-food raw materials. Among others it is Brzóska [2006] that points to this aspect, whereas Urban [2005] treats it as a specific kind of danger to domestic food producers from the countries of low production costs. As results from the abovementioned facts, the reduction in export subsidies may cause a drop in the volume of export of agri-food products, which confirms the conjectures made by Czyżewski and Poczta [2006]. Decreased remunerability of the export of Polish food to the low-price markets in consequence of the abolishment of export subsidies was also predicted by Urban [2005] and Plewa [2005].

4. Conclusion

On the basis of the conducted analyses it is possible to conclude that the effect of trade creation and shifting, which was brought about in consequence of Poland's joining the Single European Market, is losing its power. As results from the GTAP simulation, in the nearest years it will be possible to observe falling dynamics in the trade exchange increase in the agri-food sector. It will be caused by reduction in the cost-price advantage on the SEM, which Polish food producers and exporters have taken so far and, if the new WTO agricultural agreement is implemented, by increased competition from producers outside the EU.

The implementation of the scenario of liberalisation of the world agricultural trade, which was negotiated at the WTO forum, may result in some Polish and EU farmers losing part of the market and, in consequence, in lower export and higher import of agri-food products from/to Poland. Thus, it is possible to conclude that the liberalisation of foreign trade exchange increases the pressure for competitiveness in the countries with low production costs and increases competition both on the domestic and international market. However, it is necessary to emphasise that until 2015 this should not cause a serious danger to the positive turnover balance in the Polish agri-food sector.

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