135 EAAE Seminar
Challenges for the Global Agricultural Trade Regime after Doha

MODELLING THE EFFECTS OF CROATIA'S ACCESSION TO THE EU: TRADE AND AGRICULTURAL POLICIES

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Abstract: Croatia joined the European Union (EU) on July 1st, 2013. This paper assesses the likely effects of this accession on the agricultural and food sectors, and analyses the impact on the EU, Croatia and their main trading partners. It considers both the harmonization of Croatia's trade instruments with those applied in the EU, and the adoption of the Common Agricultural Policy (CAP). The analysis is carried out using MAGNET, a global recursive dynamic CGE model. Results show that Croatia slightly benefits from its accession to the EU with an increase in GDP, whereas the impact on the EU-27's GDP is insignificant. Total exports of Croatian agricultural products increase by 7.4% and those of food products decrease by 2%. Croatia will face some changes in its production structure. At constant prices, agricultural production benefits (increasing by 1.1%), whereas food production contracts (decreasing by 5.5%). This result sheds some light on competitiveness limitations of the Croatian food processing industry. The scope of this paper is to model both European trade and

agricultural policies. It is worth mentioning that other EU policies such as the structural or cohesion policies, and additional gains resulting from the accession such as a less risky investment environment or a more efficient regulatory framework, are not modelled.[1]

Keywords: CGE, European integration, agricultural policy, agricultural trade

INTRODUCTION

Croatia became the 28th member of the European Union (EU) on July 1st, 2013. It was an official candidate, with the full benefits associated with this status since 2004. The agricultural sector and food processing chain have been core issues within the negotiation process. Croatia's trade with the EU has been gradually liberalised through the Stabilisation and Association Agreement (SAA) which entered into force in 2005, whereas rural development benefited from technical and financial assistance. The SAA constitutes the contractual framework of relations between the EU and the Western Balkan countries, prior to an accession agreement. To date, SAA have been signed with Albania, Bosnia and Herzegovina, FYR Macedonia, Serbia and Montenegro. On June 28, 2013, the European Council authorised the opening of negotiations on a SAA between the EU and Kosovo. Beyond promoting security or fundamental rights, SSA foster trade integration between the EU and Western Balkan countries. Thus prior to accession, Croatia already benefited from duty-free access to the EU for most of its agricultural exports (with some exceptions, notably for sugar, beef and wine). However as the SAA was an asymmetrical trade agreement, EU agricultural exports to Croatia faced border protection that has been removed as of the date of accession.

The Republic of Croatia is a relatively small country, with a population of 4.4 million (Eurostat 2012). Currently Croatia's GDP makes up approximately 0.35% of the EU-27 total GDP (Eurostat 2012). In per capita terms, Croatia's wealth is 60% of the EU-27 average, which is well above the current level of Bulgaria and Romania (around 47%) which accessed the EU in 2007 (Eurostat 2012). Croatia's share of agriculture in GDP is about 5.1% in 2011 (Eurostat 2012). For comparison, the share of agriculture in GDP of the EU-27 amounts to 1.7%. In Croatia, as much as 13.8% of the working population is employed in the agricultural sector while in EU-27 only 4.7% in 2010 (Eurostat 2011). Therefore providing a rigorous assessment of the effects of the 2013 enlargement on the agri-food sectors is key for the whole Croatia's economy.

[1] The views expressed in this paper are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission.

However given that trading blocs are linked through international price systems, trade relations, capital flows, etc., a comprehensive analysis of the economic consequences of Croatia's accession to the EU for the agri-food sectors in both regions is rather complex. Harmonisation of Croatia's trade instruments – both tariff and non-tariff measures – with those applied in the EU is expected to affect not only both regions but also their trading partners. There are considerable discrepancies in the pattern of protection in the agri-food sectors applied in Croatia and the EU-27 prior to Croatia's EU accession. These, combined with different tariffs applied to Croatian and EU exports by their trading partners, suggests significant potential for trade creation and diversion effects in Croatia after EU accession.[2]

Clearly, with Croatia's EU accession, some Croatian agricultural sectors will gain via an expansion of trade (through a decrease of trade costs). For example, sectors, which before accession faced some protection on the EU side – e.g. beef – may expand with the abolition of EU tariffs, unless they become restricted by other newly introduced policy measures – e.g. by production quotas in the case of sugar. On the other hand, harmonization of tariffs applied to Croatian exports by non-EU partners with those applied to the EU may lead to an increase of some tariffs faced by Croatian exporters and therefore will reduce some trade flows with non-EU partners (trade reduction). Furthermore, trade diversion effects may occur both for Croatia as well as EU, should imports from more efficient non-EU producers be substituted by imports from less efficiently producing countries within the European Union. [3] As all these adjustments, depending on scale and direction, may affect not only trade but also the level of production and GDP in Croatia and all involved regions, it is understandable that the net effect of tariff harmonisation can only be derived in a comprehensive empirical analysis.

Given the accession, Croatia has to adopt the Common Agricultural Policy (CAP). The scope of this paper is to model both common trade policy and CAP. It is worth mentioning that other policies exclusively designed for EU members

[2] From an agricultural trade perspective, the EU is Croatia's most important trading partner by far, followed by the Western Balkans treated as a single region and Brazil. In 2011, the EU accounted for 60% of Croatia's exports and imports value. By contrast, Croatia captured only 0.5% of both EU exports and imports. Western Balkan countries accounted for about 10% of Croatia's trade value. In 2008, the main export markets for Croatia's agricultural and food products were the Western Balkan countries and the EU. The structure of Croatian imports is less concentrated, with Brazil being the main foreign provider of agricultural and food products after the EU.

[3] See Viner (1950) for the economic theory of regional integration arrangements (customs unions).

such as the structural or cohesion policies, and additional gains resulting from the accession such as a less risky investment environment and expected increases of Foreign Direct Investments (FDIs) or a more efficient regulatory framework are not modelled. Thus outcomes from Croatia's accession presented in this paper are not exhaustive.[4]

There are several studies that assess the impact of Croatia's integration, for example Sosic et al. (2005) or Bussiere et al. (2008), both of which analyse the effects of Croatia's trade integration with the use of a gravity model. The main weakness of these approaches is their incompleteness. Both of them miss the full picture of the impact of Croatia's integration as they do not include the entire economic system for all the regions/trading blocs involved. This is important when examining the overall impact of policy changes on the agri-food sectors, which necessitates consideration not only of direct effects but also of the accompanying impacts throughout the rest of the economy. However, this is feasible with a multi-country computable general equilibrium (CGE) model.

Lejour et al. (2009) uses *WorldScan,* a global CGE model to assess the impacts of Croatia's accession to the EU. They estimate that Croatia's GDP and consumption would increase by 1.1% and 2.6% respectively. The agriculture and food processing sectors would contract by 1.1% and 3.1% respectively. The main limits of their analysis are however that (i) the data used were from 2001 (the base year that was used to calibrate their model), (ii) the study did not consider the direct impacts of the CAP and other EU funds, and (iii) the sectors were highly aggregated, therefore, the agri-food sectors were not well represented.

By contrast to previous studies, our paper focuses on the impact on the individual agri-food sectors. Moreover, our study specifically contributes to the analysis by including the CAP budget, with differentiated policy measures (i.e. first pillar and second pillar disaggregated by 5 different measures) within a CGE context. This is in strong contrast to a number of other studies which assess the impact of Croatia's access to the CAP budget without using any economic modelling tools (such as Kumric et al., 2005 or Möllers et al., 2009). Here a

[4] Once it will be fully implemented in 2022, CAP budgetary support for Croatia will reach approximately 995 million USD per year.[4] CAP captures about 25% of total EU budget transfers to Croatia in 2013 (European Commission, 2011).[4] Furthermore, from 2013 onwards Croatia will benefit from other EU payment appropriations, especially those growth and employment programs, which include structural and cohesion funds of approximately 1,900 million USD per year.

global recursive dynamic CGE model, MAGNET, is used to analyse the impacts of Croatia's accession to the EU on the main macroeconomic variables such as trade, production and GDP in Croatia, the EU and their main trading partners while focusing on the agri-food sectors. The second section of this paper presents briefly the model and data used for the analysis, as well as the baseline that covers the period 2008-2018. The third scenario outlines the scenario performed. Results on agri-food sectors are presented in the fourth section, i.e. effects on trade, production and GDP. The last section provides some concluding remarks.

1. METHODOLOGY

The model used to analyse the economic consequences of Croatia's accession to the EU is Modular Agricultural GeNeral Equilibrium Tool (MAGNET).[5] MAGNET is a global (worldwide) economic simulation model that consists of a set of single-country CGE models linked by their trading relationship. MAGNET is based on the GTAP model (Hertel, 1997), a widely used tool for global trade analysis. Of particular interest, for this paper, is the CAP module which allows the inclusion of a CAP budget (i.e. Croatia will receive 788 million USD in 2018, see Table 2). It is worth mentioning that we focus on agricultural and rural development expenditures and not on the contribution side of the CAP budget. Effects of transferring financial resources between EU-28 and related budgetary trade-offs are not taken into account.

In this paper the CAP budget is defined by the sum of first and second pillar payments. Decoupling of factor subsidies is handled in such a way that first pillar subsidies are linked to land (broad definition of decoupled payments), and the same is done for the agri-environmental payments of the second pillar, as they are considered subsidies to land (similar assumptions were set in the Scenar 2020 II study using LEITAP (Nowicki et al., 2009)). The other four second pillar measures are assumed to increase the overall productivity (e.g. output augmenting technological change) and the input productivity (intermediate input augmenting technological change). The increase depends *interalia* on four coefficients which are determined exogenously (the latter are borrowed from Nowicki et al., 2009) and capture the technology effects of the types of second pillar subsidies which have already been defined.

[5] MAGNET is part of the integrated Modelling Platform for Agro-economic Commodity and Policy Analysis (iMAP) hosted by the European Commission's Joint Research Centre, Institute for Prospective Technological Studies (M'barek et al., 2012).

In order to reflect sugar policies, we impose a sugar production quota for the EU and Croatia which is modelled by fixing the sugar production volume in these two regions/countries and endogenizing the tax on the production of sugar.[6]

Data used in this study are based on the most recent GTAP database version 8 (Aguiar et al., 2012) released in March 2012 and contains data for 2007[7]. This database contains complete bilateral trade information, transport and protection linkages. It includes 57 commodities and 129 regions, aggregated for the purpose of this study to 22 commodities of which 20 are part of the agri-food sectors, and 6 regions. The EU-27 and Croatia have been specified separately, as have their main trading partners, i.e. Western Balkans, non-EU-OECD countries, Mercosur and the rest of the world. Furthermore, each region's economy was disaggregated according to nine accounts[8].

In order to construct a baseline, projections of GDP, population and other indicators are used and obtained from various sources. First, data on GDP and population are sourced from the USDA-ERS projections[9]. Projections by the World Development Indicators (WDI) are the main source of data for labour force. Last, data for capital stock projections are taken from the OECD[10].

The following types of CAP support are distinguished within MAGNET: (i) First pillar measures which include Single Farm Payments (SFPs), other direct payments and market measures, (ii) Investment in agriculture, (iii) Investment in human capacity, (iv) Investment in technology, (v) Support to Less Favoured Areas (LFAs), and (vi) Agri-environmental measures. Data used in the CAP module come on the one hand from the European Agricultural Guarantee Fund for first pillar measures, and on the other hand from the European Agricultural Fund for Rural Development for second pillar measures. For second pillar measures, both European and national contributions are taken into account. Data for Croatia come from the IPARD Programme 2007-2013 and financial package for the accession negotiations (European Commission, 2009). Table 1 presents CAP budget allocation in EU-27.

[6] In the baseline it is assumed that the EU-27 quota for sugar which in 2006/2007 amounting to 17,594,327 tonnes (16,907,591 tonnes for sugar and 686,736 for isoglucose) will be reduced by 2015 to 12,735,000 tonnes (-28% approximately) and thereafter (2015-2018) will stay at the same level.

[7] The database documentation for GTAP8 is not yet fully available at the date of writing this paper. Documentation of database GTAP 7 is available in Narayanan and Walmsley (2008).

[8] Activities, intermediate inputs, factors, households (regional and private), government, savings & investment, taxes, margins (trade costs and transport), and rest-of-the-world (trade, transfers, etc.).

[9] http://www.ers.usda.gov/Data/Macroeconomics/#BaselineMacroTables

[10] http://www.oecd.org/home/0,2987,en_2649_201185_1_1_1_1_1,00.html

Table 1: Projected allocation of CAP budget in EU-27 (million USD in nominal terms)

	2010	2013	2018
Pillar 1	59,421.7	62,987.1	63,266.6
Pillar 2			
Investment in agriculture	7,247.9	7,818.4	7,818.4
Investment in human capacity	2,920.3	3,150.2	3,150.2
Wider rural development	5,862.0	6,323.5	6,323.5
LFAs	4,408.4	4,755.4	4,755.4
Agri-environmental measures	9,351.5	10,087.6	10,087.6
Total	**84,803.5**	**90,366.8**	**90,646.3**

Source: authors' calculations on the basis of EAGF Financial Report (2008 financial year), financial plans per Member State for the programming period 2007-2013 as reported by EAFRD, and the MFF proposals and the CAP reform proposals presented in COM(2011) 628 final/2.

2. SCENARIO DESIGN

The following shocks are run simultaneously: (i) Abolition of all external tariffs, subsidies and taxes on traded commodities, products and services between Croatia and the EU; (ii) Full harmonization of all external tariffs, taxes and subsidies on traded commodities, products and services applied previously by Croatia to its non-EU trading partners – i.e. Western Balkans, OECD, Mercosur and ROW – with those applied by the EU; (iii) Adjustment of tariffs, taxes and subsidies previously applied by Croatia's non-EU trading partners – i.e. Western Balkans, OECD, Mercosur and ROW – in relation to trade with Croatia to those valid for the EU; (iv) Allocation of the CAP budget to Croatian agri-food sectors according to the accession financial package as agreed in 2009. The breakdown of rural development measures for the period 2011-2018 remains the same as for the period 2007-2010. Both European and national financial contributions are taken into account (Table 2).

Table 2: Projected allocation of CAP budget in Croatia (million USD in nominal terms)

	2010	2013	2018
Pillar 1	0.0	127.8	306.6
Pillar 2			
Investment in agriculture	8.7	92.5	115.7
Investment in human capacity	15.2	161.0	201.3
Wider rural development	12.0	127.3	159.1
LFAs	ns	ns	ns
Agri-environmental measures	0.5	4.9	6.1
Total	**36.3**	**513.4**	**788.8**

Source: authors' calculations on the basis of the IPARD Programme 2007-2013 for Croatia, and financial package for the accession negotiations (European Commission, 2009).

The European sugar regime is currently experiencing significant reforms, especially with the present production quota system that will expire in 2014/2015. Consequently, it was assumed that upon EU accession (in 2013) Croatia's level of sugar production (230,000 tonnes in 2007) will be reduced by 16% (in order to meet the sugar quota 192,877 tonnes). This amount was agreed during the accession negotiations with Croatia (European Commission, 2009). We assumed that in consequent periods (until 2018) the sugar quota in Croatia would remain at this level.

3. RESULTS

All results presented in this paper are obtained by comparing the effect of policy shocks (Croatia's accession to the EU) with the derived baseline on selected variables – i.e. exports, imports, production, and GDP.

3.1. Trade

Our results show that Croatia's EU accession affects significantly Croatia's exports of primary agricultural and food products to the EU (Table 3). The sectors which witness the greatest positive export growth are wheat (36 million USD), vegetables and fruit (15 million USD), beef (12.8 million USD) and other meat (18.6 million USD). Interestingly, an increase in EU imports of wheat, vegetables and fruit and other meat from Croatia is not due to changes in bilateral tariffs between the EU and Croatia which were already zero, but due to trade diversion effects from different destinations (OECD, ROW or Western Balkans) to the EU (tariffs faced by Croatia in those countries after the EU accession are higher than before). In the case of beef which was protected by the EU prior to accession of Croatia, the result is a combination of increased market access for Croatia and a redirection of Croatian trade. The Croatian beef sector loses 8.5 million USD of exports towards OECD countries and the ROW due to harmonization of tariffs towards third trade partners (trade diversion effect).

While Croatia's agricultural sector increases its exports to the EU by 31.7% (96.9 million USD) the food sector decreases its EU exports by 19.7% (185.6 million USD). This decrease is driven by the sugar sector, whose exports to the EU fall by 43% (229.0 million USD). The introduction of the sugar production quota in Croatia causes production to fall hence the negative performance in exports.

Table 3: Value of EU27 and Croatia's imports in 2018 (million USD and % change)

	Value of EU's imports						Value of Croatia's imports							
	from Croatia				from all trading partners		from the EU27				from all trading partners			
	baseline	scenario	diff.	%	diff.	%	baseline	scenario	diff.	%	baseline	scenario	diff.	%
Rice	0.0	0.0	0.0		1.0	*0.2*	0.4	0.5	0.0	*9.7*	0.5	0.5	0.0	*0.0*
Wheat	46.7	*82.8*	36.1	*77.3*	10.0	*0.2*	0.4	0.4	0.0	*-7.0*	0.5	0.4	-0.1	*-20.0*
Other cereals	5.0	5.7	0.7	*13.9*	1.0	*0.0*	38.4	34.3	-4.1	*-10.7*	48.7	43.6	-5.1	*-10.5*
Vegetables, fruits	72.4	*87.7*	15.3	*21.1*	-1.0	*0.0*	116.0	110.0	-6.0	*-5.2*	172.0	157.0	-15.0	*-8.7*
Oilseeds	11.4	15.1	3.7	*32.5*	4.0	*0.1*	14.7	12.1	-2.6	*-17.7*	17.6	14.4	-3.2	*-18.2*
Sugar cane, sugar beet	0.3	0.7	0.4	*121.4*	0.1	*0.2*	7.1	6.0	-1.1	*-16.0*	9.2	7.6	-1.6	*-17.7*
Plant-based fibres	16.2	18.1	1.9	*11.7*	0.0	*0.0*	0.5	0.5	0.0	*-4.9*	1.9	1.8	-0.1	*-4.8*
Other crops	15.9	20.0	4.1	*25.8*	5.0	*0.0*	76.3	72.9	-3.4	*-4.5*	102.0	92.7	-9.3	*-9.1*
Live cattle, sheep, goats	20.3	23.9	3.6	*17.7*	4.0	*0.1*	115.0	122.0	7.0	*6.1*	116.0	122.0	6.0	*5.2*
Live pigs, poultry, other	54.5	60.0	5.5	*10.1*	6.0	*0.1*	65.2	61.6	-3.6	*-5.5*	78.9	74.2	-4.7	*-6.0*
Raw milk	44.3	56.0	11.7	*26.4*	2.0	*1.3*	0.1	0.0	0.0	*-16.4*	0.2	0.2	0.0	*-15.5*
Wool, silk-worm cocoons	18.3	32.2	13.9	*76.0*	-1.0	*-0.1*	0.0	0.0	0.0	*-25.0*	0.3	0.2	-0.1	*-24.8*
Agriculture	**305.3**	**402.2**	**96.9**	*31.7*	**31.1**	*0.0*	**434.2**	**420.3**	**-13.9**	*-3.2*	**547.8**	**514.6**	**-33.2**	*-6.1*
Meat beef, sheep, goat	38.0	50.8	12.8	*33.7*	26.0	*0.2*	10.4	22.0	11.6	*111.5*	40.0	31.6	-8.4	*-21.0*
Meat pork, poultry, other	66.8	85.4	18.6	*27.8*	17.0	*0.1*	133.0	254.0	121.0	*91.0*	176.0	268.0	92.0	*52.3*
Vegetable oils and fats	16.9	18.1	1.2	*7.1*	1.0	*0.0*	21.6	34.3	12.7	*58.8*	80.5	78.8	-1.7	*-2.1*
Dairy products	53.5	56.3	2.8	*5.2*	33.0	*0.1*	82.6	112.0	29.4	*35.6*	128.0	144.0	16.0	*12.5*
Milled Rice	0.1	0.1	0.0	*3.7*	0.0	*0.0*	4.7	5.5	0.9	*18.3*	8.5	7.5	-1.0	*-12.0*
Sugar	533.0	304.0	-229.0	*-43.0*	43.0	*0.4*	2.5	52.4	49.9	*1,971.1*	130.0	212.0	82.0	*63.1*
Other food Products	156.0	164.0	8.0	*5.1*	10.0	*0.0*	596.0	636.0	40.0	*6.7*	826.0	822.0	-4.0	*-0.5*
Beverages and tobacco	78.2	78.2	0.0	*0.0*	-5.0	*0.0*	153.0	157.0	4.0	*2.6*	196.0	198.0	2.0	*1.0*
Food	**942.5**	**756.9**	**-185.6**	*-19.7*	**125**	*0.0*	**1,003.8**	**1,273.2**	**269.4**	*26.8*	**1,585.0**	**1,761.9**	**176.9**	*11.2*
Manufacturing	5,828.0	6,299.0	471.0	*8.1*	-6340	*0.0*	13,550.0	11,159.0	-2,391.0	*-17.6*	23,184.0	23,428.0	244.0	*1.1*
Service	4,827.0	4,854.0	27.0	*0.6*	-207.0	*0.0*	3,299.0	3,311.0	12.0	*0.4*	4,717.0	4,734.0	17.0	*0.4*
TOTAL	**11,903**	**12,312**	**409.0**	*3.4*	**-686**	*0.0*	**18,288.0**	**16,163.0**	**-2,125.0**	*-11.6*	**30,034.0**	**30,439.0**	**405.0**	*1.3*

Source: MAGNET results

The situation is different when analysing Croatia's imports from the EU. Croatian imports of primary agricultural products fall by 14 million USD (-3.2%). The greatest decreases are found in the following sectors: other cereals, vegetables and fruits, oilseeds and live pigs and poultry. While agricultural imports decrease, Croatia imports of food products increase by 270 million USD (26.8%). The value of Croatian imports of cattle, sheep and goat meat from the EU increase by 11.6%, and of dairy imports by 29.4%. The products that were facing the highest protection before the accession are those for which imports increase the most, e.g. Croatia was levying a tariff of 30% on pork and poultry from the EU, and after the accession Croatia's imports of these products from the EU increase by 91%.

Looking at Croatia's total imports at the aggregated level, it appears that some sectors are more affected than others. While Croatia's accession to the EU causes an abolition of Croatian protection for imports coming from the EU, it generally leads to an increase in protection of Croatian agricultural and food sectors for imports coming from third countries. These two elements result in a drop in total agricultural imports of 6.1%, and an increase in total imports of food products of 11.2%. After the accession to the EU, total exports of Croatian agricultural products increase by about 7.4%. At the same time total Croatian food exports decrease by about 2.2%. Clearly, Croatia is confronted with a different rate of protection of agri-food products than it was before accession. Looking at other trading blocks, Croatia's accession to the EU does not have significant impacts on those regions in terms of percentage change in exports.

3.2. Production

Trade liberalization is expected to affect the quantity of goods produced in Croatia and the EU (Table 4). Our results show that Croatia's EU accession leads to an increase in production volume for the majority of agricultural products (except for sugar beet, wheat and other cereals) and a decrease in production volume for most food products (except beef, sheep and goat meat).

While after EU accession the prices of many agricultural and food products drop, the value of production of Croatian agri-food sectors decreases for almost all major branches (except sugar, wool and silk-worm cocoons, plant-based fibres, and beef, sheep and goat meat). In aggregated terms, the value of agricultural and food production decreases by about 5.4% and 4.1% respectively. Croatia will experience strong price effects since at constant prices, Croatia's agricultural production benefits (increasing by 1.1%), whereas food production contracts (decreasing by 5.5%). Change in the sugar sector is a key driver since the producer price in Croatia increases by about 156%. This rise is led by the imposed sugar production quota. As a result, the value of sugar production increases by about 35 million USD.

The sector producing beef, sheep and goat meat experiences a positive but small development. Despite a decrease in prices, the value of production increases by about 9 million USD. Other sectors that benefit are wool, silk-worm cocoons (8 million USD), plant-based fibres (2 million USD) and milled rice (1 million USD). Larger decreases are seen for vegetables and fruits (140 million USD), other food products (140 million USD), pork, poultry and other meat (128 million USD), and the beverage and tobacco sector (84 million USD). These results illustrate the deficiency in competiveness of Croatian agricultural and food sectors in contrast to other EU Member States. Furthermore, higher tariffs faced by Croatian exporters after Croatia's EU accession (effect of harmonisation of tariffs by its previous trading partners i.e. the Western Balkans, OECD, Mercosur and ROW, to those applied to the EU) reduce Croatian exports and thus lead to significant drop in production .

Table 4: Value of EU27 and Croatia's production in 2018 (million USD and % change)

	Value of EU's production				**Value of Croatia's production**			
	baseline	**scenario**	**diff.**	***%***	**baseline**	**scenario**	**diff.**	***%***
Agriculture	417,600	417,645	45	*0.01*	8,669	8,202	-467	*-5.39*
Food	1,338,360	1,338,788	428	*0.03*	7,948	7,619	-329	*-4.14*
Manufacturing	8,040,430	8,038,887	-1543	*-0.02*	34,614	33,724	-890	*-2.57*
Service	19,881,212	19,878,634	-2578	*-0.01*	68,813	69,358	545	*0.79*
TOTAL	**29,677,602**	**29,673,954**	**-3,648**	***-0.01***	**120,044**	**118,903**	**-1,141**	***-0.95***

Source: MAGNET results

The effects of Croatia's EU accession on the manufacturing and service sectors in Croatia are significant. Yet, they differ both in magnitude as well as in direction. It is important to note that the negative impact of Croatia's EU accession on the Croatian manufacturing sector is not due to the direct trade effects between the EU and Croatia, since the manufactured goods trade was already liberalized before the accession (in fact we observe that the value of Croatian imports of manufactured goods from the EU drops after EU accession). Instead, after EU accession we observe in Croatia a significant increase in imports of manufactured products from the ROW (34.7%) which is mainly caused by a reduction of Croatian tariffs towards third countries and potential

income effect. Obviously, these sizeable imports from the ROW not only substitute EU manufactured goods (exported to Croatia) but also replace less competitive domestic manufacturing production.
Given Croatia's small share of the EU import and export markets, no sector in the EU faces a change greater than +/-0.7%. Yet, as opposed to in Croatia, in the EU-27 both the agricultural and food producers gain (45 million USD and 428 million USD, respectively) due to an increase in exports to Croatia, the EU producers of sugar (120 million USD), of pork and poultry (118 million USD), and other food products (97 million USD) benefit the most. Meanwhile, the EU producers of manufacturing and services slightly lose out with the enlargement and subsequent reallocation of resources. The effects of Croatia's EU accession on production on third countries are relatively minor. In percentage change is so insignificant that it is not worth highlight it, so the focus is placed in absolute terms. In the ROW, substitution of EU products on Croatian markets translates into approximately 3960 million USD in production gains, mostly outside the agri-food sectors and sugar (155 million USD). Contrary to producers in the ROW, other trading blocs like OECD and Mercosur are negatively affected since both face higher entry barriers to Croatian markets after the accession to the EU.

3.3. GDP

The country that benefits the most from Croatia’s adoption of EU agricultural and trade policies is Croatia itself; its GDP rises by 0.33% or about 235 million USD, i.e. approximately 172 million euros, which it is probably an underestimate as the model doesn't include factors that will greatly benefit Croatia, such as FDI or structural funds from the EU. Nevertheless, Croatia’s GDP represents only around 0.35% of the EU’s GDP. Therefore, the impact of Croatia's accession to EU is in general very small.

EU’s GDP decreases by 0.006% (1.1 billion USD). This slight loss in the EU’s GDP is insignificant and does not mean that the EU does not benefit from having Croatia access the EU, one need to take into account that the model does not capture all the different public or private transfers expected with this accession, as well as non-economic considerations such as political gains or regional stabilization. This means that our analysis probably underestimates the gains from such an accession. Moreover, beyond 2018, we would expect Croatia to keep growing and have a bigger positive impact on the EU. At the same time, Croatia's accession to the EU raises the ROW’s GDP by 0.005% (in absolute terms by as much as 1.1 billion USD) mainly due to additional exports of non-agri-food products. On the other hand, it reduces GDP for OECD (334 million USD), Mercosur (112 million USD) and lastly for the Western Balkans (1 million USD). The decrease in GDP for these regions reflects the effects of

changes in trade pattern; exports from these regions to Croatia, after its EU accession, are falling due to Croatia's increased external protection (trade diversion effects).

CONCLUDING REMARKS

This paper assesses the likely effects of Croatia's accession to the EU on the agricultural and food sectors. The analysis is carried out using the global recursive dynamic CGE model MAGNET, and results take into consideration the shift in trade and agricultural policies in Croatia.

Main results show that Croatia will benefit from its accession to the EU with modest increase in its GDP, whereas the impact on the EU-27's GDP is marginal. However this doesn't mean that the EU does not benefit from this enlargement, one needs to take into account that the model does not capture all the different transfers – and subsequent effects – expected with this accession, being public (especially structural funds) or private (especially FDIs). An in-depth analysis of removing non-tariff measures would also be needed. In addition gains from the adoption of transparent and stable regulatory frameworks are likely to be significant, and would require further examination.

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