

Impact of Croatian EU Accession on Regional Trade Patterns

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Abstract

This report aims to analyse the regional trade effects of Croatia's accession to the EU and simultaneous exit from the CEFTA agreement on 1st July 2013. The Global Simulation Model (GSIM) as proposed by Francois and Hall (2003) is being applied. As the change in Croatian tariff protection is rather small, price and output changes for most CEFTA countries are expected to be mostly negligible. Only for Croatia the simulation suggests that overall consumer prices might fall by as much as 0.39% and real output by 0.41%, in the short run. However, it can be expected that EU support funds will offset that loss many times over. The share of Croatian exports to the EU is expected to increase by 2.2 percentage points, while the share of exports to the CEFTA countries and to the rest of the world is expected to drop by 0.7 and 1.5 percentage points, respectively.

Keywords: trade policy simulation, Croatia, EU accession, CEFTA

JEL classification: F15, F17, P33

1. Introduction

Croatia entered into the Central European Free Trade Agreement (CEFTA) in 2003. Soon thereafter most of the other members of CEFTA withdrew from the agreement and joined the European Union (EU). As a consequence, the Czech Republic, Hungary, Poland, Slovakia and Slovenia left CEFTA in 2004, only to be followed in 2007 by Bulgaria and Romania. The sole country to join the free trade agreement in that period was Macedonia; it entered in 2006. After the summit meeting on 6th April 2006 in Bucharest, the prime ministers of Southeast Europe adopted a joint declaration on the expansion of CEFTA so as to include Albania, Bosnia and Herzegovina, Moldova, Serbia and Montenegro, and Kosovo was adopted. A year later those countries joined CEFTA.

In the past CEFTA mainly served as an antechamber to full EU membership. This also held true for Croatia that concluded its EU accession negotiations on 30th June 2011 and signed the treaty of accession on 9th December 2011. With the ratification process now complete, the accession of Croatia to the EU will take place on 1st July 2013, concurrent with its withdrawal from CEFTA. Applying the Global Simulation Model suggested by Francois and Hall (2003), the present note estimates the impact that Croatian accession to the EU might have on regional trade patterns.

To the author's knowledge there has been no recent attempt to estimate the trade effects of Croatia's EU accession. There have been a number of earlier studies that tried to analyse a wide range of issues related to Croatian EU accession (see for instance a series of anthologies by Ott, 2003, 2004, 2005, 2006). Also more recently, a number of anthologies tried to identify the benefits and challenges of an EU accession for Croatia (e.g. Butkovic et al., 2007; Tisma et al., 2012). A detailed descriptive study by Botric (2012) looks specifically at the issue of intra-industry trade between the EU and the Western Balkans.

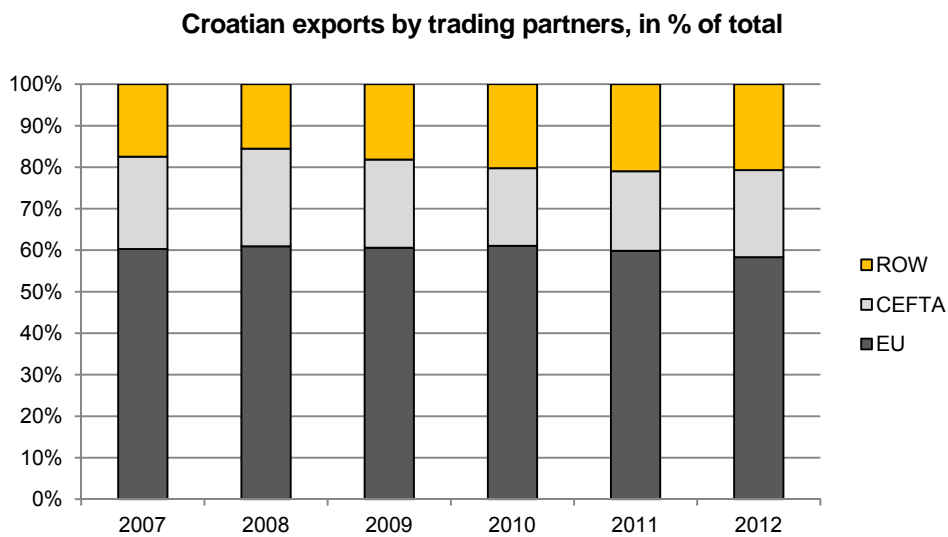
At the end of May 2013, a panel on Croatia's exports before and after EU accession on 1st July was held as part of a Croatian Exporters (HIZ) convention. There, several Croatian economists argued that the Croatian exit from CEFTA and simultaneous EU accession might have negative short-run trade effects in the order of 0.2% to 0.5% of GDP, but positive longer-run effects of some 0.2% of GDP. Also, access to additional EU funds might have positive effects of 1% to 1.4% of GDP.

However, to the author's knowledge the present study is the first to try to simulate an EU accession of Croatia and the respective trade effects on the remaining CEFTA countries. In the following the recent developments of Croatian trade with its main trading partners from the EU and CEFTA since the implementation of the CEFTA 2006 agreement are described; the applied simulation model, the data used and the results of the simulation exercise are presented. The conclusions provide some policy recommendations.

2. Recent development of Croatian trade

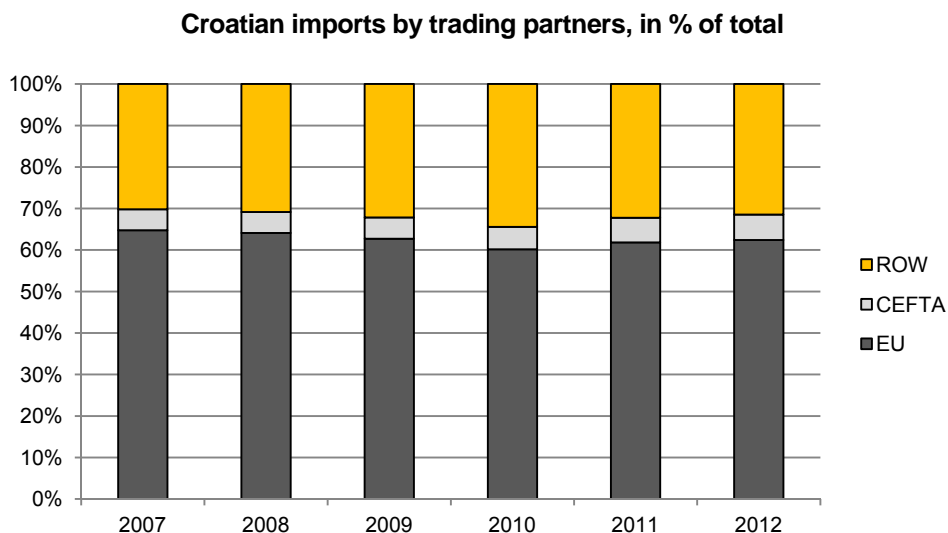
The evolution of Croatian trade since the adoption of the CEFTA 2006 agreement shows a relatively stable regional structure. This applies to both exports and imports. Figure 1 presents the export shares with the EU-27, the CEFTA countries and the rest of the world (ROW). These shares are almost constant. About 60% of Croatia's exports are absorbed by the EU, while approximately 20% go to CEFTA countries and ROW, respectively. This pattern has hardly changed since the expanded CEFTA agreement entered into effect in 2007 and the global recession started in 2009.

Figure 1



Source: wiiw Annual Database.

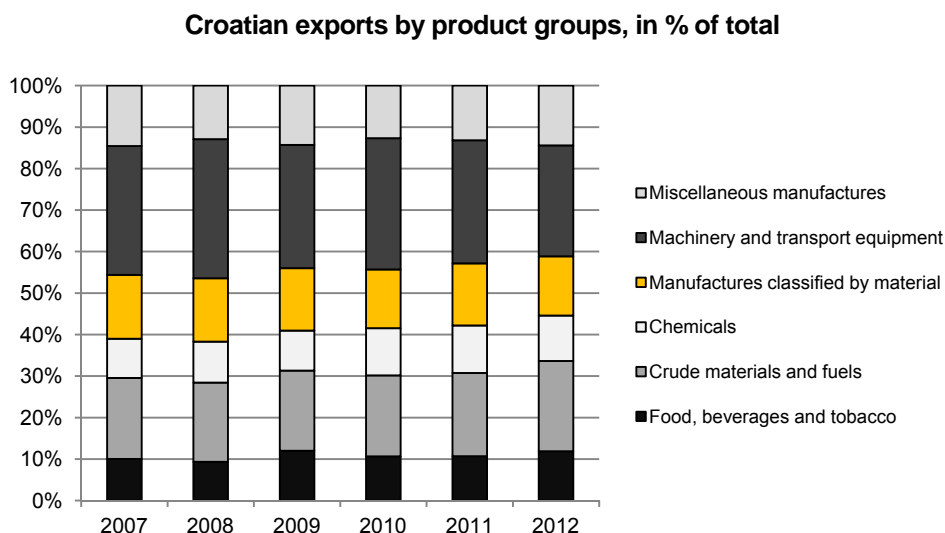
Figure 2



Source: wiiw Annual Database.

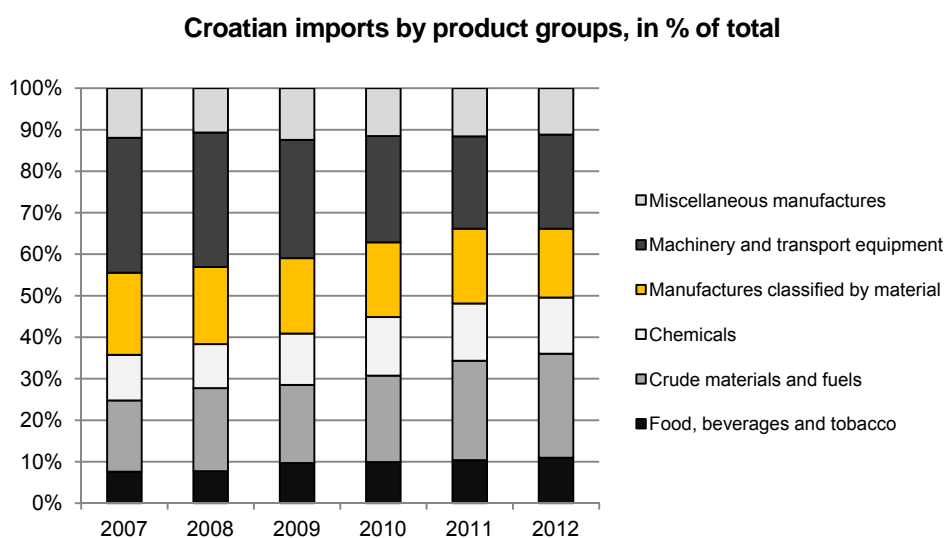
The situation is quite similar where imports are concerned (see Figure 2). In the latter instance, more than 60% of Croatia's imports stem from the EU and more than 30% from ROW. In recent years, however, only about 5-6% of Croatian imports have come from other CEFTA countries.

Figure 3



Source: wiiw Annual Database.

Figure 4



Source: wiiw Annual Database.

The commodity structure of Croatian exports has also been comparatively stable over the past few years. Figure 3 presents the export shares of aggregated product groups taken from the Standard International Trade Classification (SITC) for the period 2007-2012. Most likely on account of the commodity price bubble across the globe as well as the economic crisis, exports shifted away slightly from machinery and transport equipment to crude

materials. The structural re-organisation of the shipyards in Croatia in the run-up to EU accession has certainly had a dampening effect on the production and export of transport equipment.

Over the past few years, the shifts in the commodity structure of exports have been even more pronounced in terms of imports (see Figure 4). Over the period 2007 to 2012, the import share of commodities and fuels increased by about 6 percentage points. At the same time, the import share of machinery and transport equipment decreased by as much as 10 percentage points. Undoubtedly, this trend is related to both high global prices for commodities and the severe, persistent domestic depression.

Thus, apart from a certain measure of change in the commodity structure of Croatian trade, which is most likely attributable to global economic developments, not much has changed in the regional composition since 2007 when the expanded CEFTA agreement adopted the year previous took effect. The question is, will the country's accession to the EU have a greater impact?

3. The model

The model applied in this study is the Global Simulation Model (GSIM) for the analysis of global, regional and unilateral trade policy changes as proposed by Francois and Hall (2003). That model has been used in a number of trade analysis papers, especially in cases where data are scarce (see e.g. Vanzetti et al., 2005; Mutambatsere, 2006; Serletis and Fetzer, 2008; Hess and Cramon-Taubadel, 2008; Leudjou, 2012).

To avoid unmanageable complexity in the model, the solution set of the model is reduced to those global prices that clear global markets. Having a global set of equilibrium prices allows to backsolve for national results. The representation of import demand is log-linearised and combined with generic export-supply equations (Francois and Hall, 1997).

One of the basic assumptions of the model is national product differentiation, as imports are imperfect substitutes for each other. Across products from different sources the elasticity of substitution is held to be equal and constant. Also the elasticity of demand in aggregate is held constant. Similarly, import supply elasticity is constant too. This approach is consistent with the Armington (1969) approach to product differentiation at the national level.

The core equation for the global market clearing condition for each export variety is the following:

$$\begin{aligned} \hat{M}_{i,r} &= \hat{X}_{i,r} \Rightarrow \\ E_{X(i,r)} \hat{P}_{i,r}^* &= \sum_v N_{(i,v),(r,r)} \hat{P}_{(i,v),r} + \sum_v \sum_{s \neq r} N_{(i,v),(r,s)} \hat{P}_{(i,v),s} = \sum_v N_{(i,v),(r,r)} [P_r^* + \hat{T}_{(i,v),r}] \\ &+ \sum_v \sum_{s \neq r} N_{(i,v),(r,s)} [\hat{P}_s^* + \hat{T}_{(i,v),s}], \end{aligned}$$

where $\hat{}$ denotes a proportional change, r and s the exporting regions, v the importing regions and i the industry designation (in the present analysis we will use total trade figures only). M and X represent imports and exports in quantities, respectively. $E_{X(i,r)}$ is the elasticity of export supply and $P_{i,r}^*$ the world price for exports from region r . $N_{(i,v),(r,r)}$ is the own price demand elasticity, $P_{(i,v),r}$ is the internal price for goods from region r imported into region v and $N_{(i,v),(r,s)}$ is the cross-price elasticity. Finally, $T_{(i,v),r}$ is the power of the tariff, $T=(1+t)$. For any set of R trading countries this equation can be used to define $S \leq R$ global market clearing conditions with R exporters. While so far the focus has been on production for export, it has to be mentioned that also domestic production for domestic consumption can be included in this framework. If also domestic production is modelled, there are exactly $R=S$ market clearing conditions. A more detailed description and definition of the relevant own- and cross-price elasticities, global supply and demand definitions can be found in Francois and Hall (2003).

Using a full-fledged general equilibrium model (which would have to include a full endogenisation of income and expenditure levels across the region) is not possible because most Western Balkan countries lack the necessary input-output tables. While our partial equilibrium model mainly portrays the initial effects of a policy change, a general equilibrium model would also show long-run effects and adjustment paths (see for instance Elshennawy, 2012 for a general equilibrium analysis of trade liberalisation between Egypt and the EU) and could be used to model additional features such as capital flows (Bouët et al., 2012), labour markets (Kitwiwattanachai et al., 2010) or income distribution (Buffie and Atolia, 2012). However, our partial equilibrium approach implies useful advantages because it allows for a rapid and transparent analysis of a wide range of trade policy issues with a minimum of data and computational requirements.

Bearing in mind the limitations of the partial equilibrium approach, some useful insights can be gained with regard to complex, multi-country trade policy changes at the industry level. The GSIM findings permit the assessment of importer and exporter effects related to tariff revenues, as well as exporter (producer) surplus, and importer (consumer) surplus.

The model requires the input of: a bilateral trade matrix at world prices; an initial matrix of bilateral import tariffs in *ad valorem* form; a final matrix of bilateral import tariffs in *ad valorem* form; export supply elasticities; aggregate import demand elasticities; and elasticities of substitution. By drawing on additional data, domestic production effects can also be fitted into the framework.

4. The data

The data necessary to run the GSIM model are detailed tariff (as well as data on subsidies if existing) and trade data (including data for trade with self, i.e. production less exports) as well as estimates of demand, supply and substitution elasticities. Data on total trade as well as simple average applied tariff rates (including *ad valorem* equivalents based on the WTO Agricultural Negotiation Forum proposal) for all the CEFTA countries, the EU and the rest of the world were mainly taken from the UNCTAD Trains (Trade Analysis and Information System) database as well as from the UN Comtrade (Commodity Trade Statistics) and Kosovo Customs and Kosovo Central Bank. In general, the data stem from the year 2011. For Bosnia and Herzegovina, Macedonia and Montenegro export data to the rest of the world had to be aligned with national trade data. Import data for Moldova and Serbia are from 2010 as well as tariff data for Kosovo and Moldova. Serbian tariff rates from 2005 (latest available year) were extrapolated to 2011 using relative Macedonian tariff change dynamics. Tariff rates against Kosovo (not available) are each country's average CEFTA tariff rates. With regard to trade with self (gross output less exports) we had to employ a crude proxy using UNSTATS National Accounts Main Aggregates Database value added data for final consumption and gross capital formation, due to the lack of proper data for the majority of countries.

Non-tariff-barriers (NTBs) such as quotas could not be included. This poses a problem especially where EU data on protection from imports from CEFTA countries and the rest of the world are concerned. In 2000, the EU granted Autonomous Trade Measures (ATMs) to the countries in the Western Balkan, thereby liberalising 95% of their exports to the EU. The remaining barriers are tariff quotas on imports of wine, baby beef and certain fishery products, as well as a number of NTBs in the textile industry. For many products licensing is mandatory. For a recent description of NTBs in the CEFTA countries see OECD (2012).

The export supply elasticity (1.5), aggregate import demand elasticity (-1.25) and the elasticity of substitution (5) were adopted from Francois and Hall (2003). However, in the case of the EU and the rest of world (ROW) an 'infinite' export supply elasticity (9999999) was assumed. This flattens out the supply curves and is in line with a small versus large country assumption.

These are certainly very simplifying assumptions. However, due to the scarce data it would be impossible to estimate 'true elasticities'. An alternative approach would be to employ average elasticities as described in 22 industry studies by Messerlin (2001) for example. There, especially the elasticities of substitution seem to be in general much lower than 5. However, in the literature an average elasticity of substitution of 5 is used quite often (see also Fujita et al., 2000).

5. The results

After feeding the model step by step with the initial bilateral trade matrix (including trade with self), at world prices in USD, the initial matrix of bilateral import tariffs in *ad valorem* form, the final matrix of bilateral import tariffs in *ad valorem* form and the elasticities, the following output was estimated: trade effects, welfare effects (producer surplus, consumer surplus and change in tariff revenue) and price and output changes.

A Croatian EU accession scenario was included in our model calculations. We thus assumed complete liberalisation of trade between Croatia and the EU, as well as the adoption by Croatia of EU tariffs vis-à-vis the CEFTA countries and ROW.

Changes in the *ad valorem* tariff rates were found to be relatively minor as most of Croatia's trade with both the EU and the CEFTA countries is already highly liberalised. Only a few trade barriers were seen to remain. Hence, Croatian tariff protection vis-à-vis Bosnia and Herzegovina as well as Montenegro is expected to change only minimally (it remains at a rate of almost 0%). Croatian tariff protection vis-à-vis Kosovo, Macedonia, Moldova and the EU, it is estimated, will be reduced by about half a percentage point. Protection vis-à-vis ROW and Albania will decline by around one percentage point and finally the largest reduction in simple average tariff rates will occur in the case of Serbia – a drop in the order of -1.5 percentage points.

Looking at the post-accession changes in average tariff rates in other countries and regions vis-à-vis Croatia, we find a reduction of -0.3 and -0.4 percentage points for Albania and Montenegro, respectively. Other countries display either a slight increase in protection (0.5 percentage points for Bosnia and Herzegovina and Macedonia) or a more substantial shift (between 3 and 4 percentage points for Serbia, Moldova and ROW). By far the most pronounced increase can be expected in the case of Kosovo (8.1 percentage points).

To a large extent, the change in simulated trade flows is determined by (i) the degree of previous and simulated trade protection and (ii) the volume of previous trade flows. Table 1 presents the percentage change in trade quantities. In general, real changes in most trade flows are minuscule (if at all). Somewhat larger changes are estimated (not surprisingly) for trade with Croatia. Croatian exports to Montenegro (+3.1%), Albania (+2.8%) and the EU (+1.6%) are expected to grow, while Croatian exports to Kosovo (-38.5%), Moldova (-19.1%), Serbia (-14.3%), Macedonia (-1%), Bosnia and Herzegovina (-0.9%) and ROW (-17.5%) are expected to decrease in real terms. Domestic sales in Croatia are expected to decrease by 0.1%. Croatian imports from Serbia (+5.4%), Albania (+3.5%), Moldova (+1.2%), the EU (+0.8%), Kosovo (+0.5%) and ROW (+2.6%) are expected to increase slightly, whereas those from Bosnia and Herzegovina (-1.3%), Montenegro (-1.3%) and Macedonia (-0.7%) are expected to drop by a narrow margin.

Table 1

Percentage change in trade quantities after Croatia's EU accession

origin \ destination	AL	BA	HR	XK	MK	MD	ME	RS	EU	ROW
Albania	0.0	0.0	3.5	0.4	0.0	0.0	-0.1	0.2	0.0	0.0
Bosnia and Herzegovina	0.0	0.1	-1.3	0.4	0.0	0.0	0.0	0.2	0.0	0.0
Croatia	2.8	-0.9	-0.1	-38.5	-1.0	-19.1	3.1	-14.3	1.6	-17.5
Kosovo	-0.3	-0.3	0.5	0.1	-0.3	-0.3	-0.4	-0.1	-0.3	-0.3
Macedonia	0.0	0.0	-0.7	0.4	0.0	0.0	-0.1	0.2	0.0	0.0
Moldova	0.0	0.0	1.2	0.4	0.0	0.0	-0.1	0.2	0.0	0.0
Montenegro	0.0	0.1	-1.3	0.5	0.0	0.0	0.0	0.2	0.0	0.0
Serbia	-0.2	-0.1	5.4	0.3	-0.1	-0.1	-0.2	0.0	-0.1	-0.1
EU	0.0	0.0	0.8	0.4	0.0	0.0	-0.1	0.2	0.0	0.0
ROW	0.0	0.0	2.6	0.4	0.0	0.0	-0.1	0.2	0.0	0.0

Source: Own calculations.

Table 2

Change in values of trade at world prices after Croatia's EU accession, in million USD

origin \ destination	AL	BA	HR	XK	MK	MD	ME	RS	EU	ROW
Albania	-0.7	0.0	0.2	0.6	0.0	0.0	-0.0	0.0	-0.0	0.0
Bosnia and Herzegovina	0.0	7.2	-10.2	0.5	0.0	0.0	-0.1	1.2	0.3	0.1
Croatia	1.7	-18.2	-129.8	-34.4	-1.6	-0.4	3.5	-71.0	104.2	-179.7
Kosovo	-0.1	-0.0	0.0	10.1	-0.1	-0.0	-0.0	-0.0	-0.5	-0.3
Macedonia	-0.0	0.0	-1.2	2.1	0.2	-0.0	-0.0	0.5	-0.5	-0.0
Moldova	-0.0	0.0	0.1	0.1	0.0	0.1	-0.0	0.1	-0.1	-0.0
Montenegro	0.0	0.0	-0.1	0.1	0.0	-	-0.8	0.3	0.1	0.0
Serbia	-0.3	-0.7	21.8	1.2	-0.5	-0.0	-1.2	15.0	-8.0	-0.7
EU	-0.3	2.3	110.5	5.6	0.8	0.1	-0.5	19.3	-72.7	6.3
ROW	-0.1	1.5	190.5	3.8	0.5	0.1	-0.3	12.4	-20.8	95.0

Source: Own calculations.

Table 3

Summary effects of Croatia's EU accession

	Welfare effects in million USD				Other effects			
	Producer surplus	Consumer surplus	Tariff revenue	Net welfare effect	Change in overall consumer prices	Change in output	Producer price for home goods	Market price for home goods
	A	B	C	D= A+B+C	per cent	per cent	per cent	per cent
Albania	0.0	0.2	-0.2	0.1	0.00%	0.00%	0.00%	0.00%
Bosnia and Herzegovina	-0.4	-3.0	7.2	3.8	0.01%	0.00%	0.00%	0.00%
Croatia	-130.2	230.4	-126.6	-26.4	-0.39%	-0.41%	-0.27%	-0.27%
Kosovo	3.6	-10.5	5.1	-1.8	0.11%	0.09%	0.06%	0.06%
Macedonia	0.4	-0.7	0.6	0.3	0.01%	0.01%	0.00%	0.00%
Moldova	0.1	-0.1	0.1	0.0	0.00%	0.00%	0.00%	0.00%
Montenegro	-0.2	0.7	-0.5	0.0	-0.01%	-0.01%	0.00%	0.00%
Serbia	10.6	-21.7	14.7	3.6	0.05%	0.04%	0.03%	0.03%
EU	389.2	-8.9	-4.5	375.7	0.00%	0.00%	0.00%	0.00%
ROW	1805.3	-153.7	34.6	1686.3	0.00%	0.00%	0.00%	0.00%

Source: Own calculations.

If one looks at the change in trade values expressed in USD millions, all of the above changes are relatively small (see Table 2). In terms of Croatia's trade with CEFTA countries, it is only the country's loss of exports to Serbia (USD 71 million) and Kosovo (USD 34 million) that appears somewhat more substantial. Certainly the drop in exports to ROW (USD 180 million) and the increase in exports to the EU (USD 104 million), as well as the drop in domestic sales (USD 130 million) are much more impressive. Croatian output is expected to fall by as much as USD 326 million; this corresponds to about 0.7% in nominal terms. In terms of nominal changes in imports, the effects are marginal. The simulation results suggest a somewhat more pronounced drop in Croatian imports from Bosnia and Herzegovina (by about USD 10 million) and an increase in imports from Serbia (by about USD 22 million). The shifts in the value of imports from the EU (an increase in excess of USD 110 million) and ROW (an increase of USD 190 million) are more substantial.

Interestingly, given that tariff rates for trade flows between Croatia and several CEFTA countries such as Montenegro hardly change with Croatia's EU accession, the question arises why there should be any change in estimated trade flows at all. Part of the answer is that relative prices change given that there are some more substantial changes in tariff rates between, for instance, Croatia and Serbia as well as Croatia and Kosovo. Due to higher tariff protection after the accession, Croatian exports to Kosovo drop by far more than a third and to Serbia by more than 14 percentage points. This reduction in Kosovo and Serbian imports is being compensated to a large extent by domestic production's sales as well as imports from the EU and ROW, but also by some additional imports from CEFTA countries. Similarly, Croatian goods that have lost market shares in Kosovo and Serbia are to a certain extent diverting to other CEFTA countries such as Montenegro (but mostly to the EU). On the other hand, given that Kosovo and Serbian goods are cheaper in Croatia after the accession to the EU due to falling tariff protection, the relative price for Montenegrin exports to Croatia increases and somewhat less can be exported from Montenegro to Croatia. As a result, Montenegro loses about USD 0.4 million in overall output, while Kosovo gains about USD 9 million and Serbia some USD 27 million. These values are negligible and, in terms of real changes, hardly measurable.

Overall, we find the simulated Croatian exports to be geared more towards the EU after accession (once the final trade barriers fall), while exports to the remaining CEFTA countries and ROW will decline (owing to somewhat higher trade barriers following accession). The share of Croatian exports to the EU is estimated to increase by 2.2 percentage points, while those to the CEFTA countries and ROW are expected to drop by 0.7 and 1.5 percentage points, respectively. Even smaller changes with regard to simulated Croatian import shares in the post-accession period are to be expected. The EU share decreases by about 0.4 percentage points, most of which moves to ROW. The share of the CEFTA countries decreases by less than 0.1 percentage points.

In terms of welfare effects (see Table 3), we can observe some minimal, but positive net welfare effects on most CEFTA economies as a result of Croatia's accession to the EU. This is mainly due to minimal changes in those countries' price structure, as well as marginal changes in real output. Only for Croatia does the simulation suggest that overall consumer prices and real output might fall by about 0.4% (a value similar to those discussed by Croatian economists at the 8th Croatian Exporters convention at the end of May 2012). This is mainly the impact of the slight reduction in tariff protection for Croatia in the wake of EU accession. As a consequence, the Croatian producer surplus drops by about USD 130 million. However, that drop is more than outweighed by an increase in consumer surplus in the order of about USD 230 million. A further loss of USD 127 million, however, is incurred through tariff revenues forgone. This yields an overall negative net welfare effect for Croatia of USD 26 million. However, it is to be expected that EU support funds will offset that loss many times over.

At this point we wish to repeat a caveat. While our partial equilibrium model mainly portrays initial effects of a policy change, a general equilibrium model would also show long-run effects and adjustment paths. However, as a general equilibrium model cannot be estimated due to data limitations, the results of the partial equilibrium model still allow us to claim that most likely Croatia's EU accession will not have any major impact on CEFTA economies. On the contrary, the effects on trade, production, prices and welfare are presumably marginal. Another caveat is related to the fact that this analysis can only take tariff protection into consideration as no *ad valorem* information on remaining non-tariff barriers is available for the countries analysed. It might well be that Croatia's accession to the EU increases NTBs between Croatia and the remaining CEFTA countries to a certain extent. Finally, there are also issues of data quality which have to be taken into consideration when interpreting the results.

6. Conclusions

The results of our simulation exercise of the Croatian EU accession and its effects on trade flows with the remaining CEFTA countries, using the Global Simulation Model (GSIM) for the analysis of trade policy changes as proposed by Francois and Hall (2003), suggest that only little change can be expected in exports and imports. This is certainly due to the fact that Croatia's accession to the EU will hardly cause any changes in bilateral tariff rates between Croatia and most CEFTA countries. Still, some changes can be expected owing to trade diversion effects, as relative prices of regional goods might change, with slightly increasing tariff protection especially of Kosovo and Serbia vis-à-vis Croatian goods after EU accession. However, these effects will be rather tiny.

Concerning trade with CEFTA countries, only the Croatian loss of exports to Serbia (USD 71 million) and Kosovo (USD 34 million) appear somewhat more substantial. Certainly the drop in exports to the rest of the world (USD 180 million) and the increase in exports to the EU (USD 104 million) as well as the decrease in domestic sales (USD 130 million) are much more impressive. Altogether Croatian output is expected to fall in nominal terms by as much as USD 326 million, which corresponds to about 0.7% of the estimated total nominal output. Real output is expected to drop by some 0.4%.

Overall, we find the simulated Croatian exports to be geared more towards the EU while reduced with regard to the remaining CEFTA countries and the rest of the world. The Croatian export shares change by 2.2 percentage points in favour of the EU. The CEFTA share drops by 0.7 percentage points and the share of exports to the rest of the world by 1.5. In terms of import shares, hardly anything changes at all.

The welfare effects are similarly unspectacular for most CEFTA countries as simulated consumer price and output changes are almost negligible. In Bosnia and Herzegovina, producer losses are insignificant and gains in tariff revenues surpass losses in consumer surplus by about USD 4 million. In Serbia, consumer losses of about USD 22 million are more than compensated by gains in producer surplus and tariff revenues and the country is left with some USD 4 million in net welfare surplus as well. Only for Croatia the simulation suggests that overall consumer prices might fall by as much as 0.39%, which would cause the producer surplus to drop by about USD 130 million. However, this is more than outweighed by consumer surplus gains in the order of about USD 230 million. Yet a major loss is the USD 130 million incurred through tariff revenues foregone. This yields an overall negative net welfare effect for Croatia of USD 26 million. However, it is to be expected that EU support funds will offset that loss many times over.

Given the minor changes simulated for the remaining CEFTA countries, no particular policy recommendations seem to be applicable at the macroeconomic level. Further research might be needed to establish whether specific industries or even products are hurt by regional changes in trade policy so that appropriate compensation policies can be developed. Furthermore, the issue of remaining non-tariff barriers needs to be addressed.

When it comes to Croatia, the effects of the country's accession to the EU are somewhat more marked and generally worrisome with regard to a simulated reduction in output, at least in the short term. Given Croatia's fixed exchange rate regime and its desire to join the euro area at the earliest possible juncture, devaluation of the nominal exchange rate is most likely not an option for offsetting the short-term negative impact of EU accession on domestic production. An increase in value-added tax and a uniform decrease in payroll tax would, however, offer a kind of fiscal policy equivalent to devaluation (see Farhi et al., 2011). Apart from that, were a more coordinated incomes policy to be introduced involving

an augmentation of the institutional power of employers' and employees' organisations and an enhancement of collective bargaining, it could have the potential to make for a more manageable real exchange rate in Croatia over the long term.

References

- Armington, P. (1969) A Theory of Demand for Products Distinguished by Place of Production. *IMF Staff Papers* 16: 159-177.
- Botric, V. (2012) Intra-industry Trade between the European Union and Western Balkans: A Close-up. *EIZ Working Papers*, No. 1202.
- Bouët, A., V. Berisha-Krasniqi, C. Estrades and D. Laborde (2012) Trade and investment in Latin America and Asia: Perspectives from further integration. *Journal of Policy Modeling* 34, 2: 193–210.
- Buffie, E.F. and M. Atolia (2012) Trade, growth, and poverty in Zambia: Insights from a dynamic GE model. *Journal of Policy Modeling* 34, 2: 211–229.
- Butkovic, H., K.A. Dujmovic and I. Ondelj (2007) *Croatia in the European Union: What can the Citizens Expect?* Zagreb: Institute for International Relations, Konrad Adenauer Stiftung.
- Eshennawy, A. (2012) The Euro-Mediterranean free trade agreement and the cost of tariff liberalization in Egypt. *Journal of Policy Modeling* forthcoming.
- Farhi, E., G. Gopinath and O. Itzhaki (2011) Fiscal Devaluations. NBER Working Paper No. 17662.
- Francois, J.F. and K. Hall (1997) *Partial Equilibrium Modeling* in J.F. Francois and K. Reinert, eds., *Applied Methods for Trade Policy Analysis: A Handbook*. Cambridge: Cambridge University Press.
- Francois, J.F. and K. Hall (2003) Global Simulation Analysis of Industry-Level Trade Policy. Technical paper, World Bank.
- Fujita, M., P. Krugman and A.J. Venables (2001) *The Spatial economy: Cities, Regions and International Trade*. Cambridge: MIT Press.
- Hess, S. and S. von Cramon-Taubadel (2008) Agricultural Trade Policy Modelling: Insights from a Metanalysis of Doha Development Agenda Outcomes. *CATPRN Commissioned Paper*, No. CP 2008-02.
- Kitiwattanachai, A., D. Nelson and G. Reed (2010) Quantitative impacts of alternative East Asia Free Trade Areas: A Computable General Equilibrium (CGE) assessment. *Journal of Policy Modeling* 32, 2: 286–301.
- Leudjou, R.R. (2012) The Doha Round and Food Security in the Dairy Sector in Cameroon: A Global Simulation Model (GSIM) Approach. *The Estey Centre Journal of International Law and Trade Policy* 13, 1: 115-130.
- Messerlin, P. (2001) *Measuring the Cost of Protection in Europe*. Washington DC: Institute for International Economics.
- Mutambatsere, E. (2006) Trade Policy Reforms in the Cereals Sector of the SADC Region: Implications on Food Security. *Cornell University Department of Applied Economics and Management Working Paper*, No. 2006-17.
- OECD (2012) Elimination of Non-Tariff Barriers in CEFTA. *CEFTA Issues Paper*, No. 4.
- Ott, K. ed. (2003) *Croatian Accession to the European Union - Economic and legal challenges*. Zagreb: Institute of Public Finance, Friedrich Ebert Stiftung.
- Ott, K. ed. (2004) *Croatian Accession to the European Union - Institutional challenges*. Zagreb: Institute of Public Finance, Friedrich Ebert Stiftung.
- Ott, K. ed. (2005) *Croatian Accession to the European Union - Facing the Challenges of Negotiations*. Zagreb: Institute of Public Finance, Friedrich Ebert Stiftung.
- Ott, K. ed. (2006) *Croatian Accession to the European Union - The challenges of participation*. Zagreb: Institute of Public Finance, Friedrich Ebert Stiftung.
- Serletis, G.S. and J.J. Fetzer (2008) Modeling the Impact of the U.S. Tobacco Quota Buyout. *USITC Office of Economics Working Paper*, No. 2008-06-A.
- Tisma, S., V. Samardžija and K. Jurlin, eds. (2012) *Hrvatska i Europska Unija - Prednosti i izazovi članstva*. Zagreb: Institut za međunarodne odnose.
- Vanzetti, D., S.F. de Córdoba and V. Chau (2005) Banana Split: How EU Policies Divide Global Producers. *UNCTAD Policy Issues in International Trade and Commodities*, Study Series, No. 31.