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The Economic Effects of Croatia's Accession to the European Union

ABSTRACT: We explore the economic implications of Croatia's possible accession to the European Union. We focus on two main changes associated with EU membership: accession to the internal European market and institutional reforms in Croatia triggered by EU membership. Consumption per capita in Croatia is estimated to rise by 2.6 percent as a result of accession to the internal market. In particular, the textile and wearing apparel sectors expand. If Croatia successfully reforms its domestic institutions in response to EU membership, income levels in Croatia could increase even more. Tentative estimates suggest that gross domestic product per capita in Croatia could rise by an additional 8 percent. Overall, the macroeconomic implications for the existing EU countries are negligible.

In the latest round of EU enlargement at the beginning of 2007, Bulgaria and Romania became the twenty-sixth and twenty-seventh EU member states. The next prospective member appears to be Croatia. The increasing uncertainty regarding the European Union's absorption capacity and future enlargements, as well as unsorted institutional issues, seem not to be affecting Croatia's current path toward accession. Croatia's small size causes little concern about the effect

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that the country would have on EU institutions, policies, and budget. Thus, EU officials have confirmed repeatedly that Croatia would join the European Union as quickly as possible, provided that it fulfills all the required accession criteria (EurActiv 2006). These criteria primarily relate to progress in adopting and implementing EU law. However, in some areas, they also include broader political and economic reforms.

This paper focuses on the economic implications of Croatia's likely accession to the European Union: whether the accession will have positive or negative effects on Croatia's macroeconomic well-being, what the effects on producers across various sectors will be, and what the consequences for consumer welfare will be. Due to the population and output size, only negligible effects could be expected on the side of the European Union. However, some sectors in a few countries, especially those neighboring Croatia, could experience more sizable effects.

Although decisions on EU accession essentially have been political ones, the economic benefits and costs of EU integration might become one of the most decisive factors for Croatian citizens, who will have to express their opinion regarding accession by referendum in due time and, thereby, make the final decision regarding EU integration. Public polls indicate that positive and negative opinions are more or less equally balanced (European Commission 2006).

The analysis of the economic effects of EU integration is accompanied by a number of constraints that have to be considered when interpreting the results. First, it is not possible to explore—or, due to high uncertainty, it is rather impossible to comprehend—all the economic costs and benefits of Croatia's accession to the European Union. Additionally complicating the analysis is that, in evaluating the economic implications of accession, it is necessary to separate the processes of economic reforms that would take place without accession from the processes that are solely due to integration itself. This paper does not attempt to discuss exhaustively all economic aspects of Croatia's accession to the European Union; rather it focuses on two policy reforms that are dealing with the accession issues from different but complementary perspectives. The first is Croatia's accession to the common internal market and the second one focuses on the institutional reforms that should result from Croatia's compliance with the *acquis communautaire*.

In the case of the first policy reform, we follow the approach in Lejour et al. (2004) and Lejour and de Mooij (2005) and calculate the potential trade between the European Union and Croatia from estimated gravity equations across fifteen different sectors. Comparing actual and potential trade gives a base for estimating the tariff equivalent of the nontariff barriers to trade between the European Union and Croatia. These barriers are then removed to simulate Croatia's accession to the EU internal market using the computable general equilibrium (CGE) model WorldScan. For the second policy reform, we calculate potential aggregate trade between Croatia and the European Union in case Croatian institutions improve. As in the previous case, the CGE simulation provides macroeconomic and sectoral effects in the case trade is increased.

A Glance at the Croatian Economy

The Stabilization and Association Agreement¹ between the European Union and Croatia set an agenda for closer cooperation. It included formal mechanisms and benchmarks to assist Croatia in meeting EU standards with the aim of formal accession and was accompanied by trade measures and financial assistance; it entered into force on February 1, 2005. In January 2002, an Interim Agreement² on trade and trade-related matters went into force with the objective of gradually establishing a free trade area over a period of six years. The trade provisions were asymmetrically set in favor of Croatia, meaning that the European Union granted Croatia unlimited free access to its own market for almost all products. With respect to the access of EU products to the Croatian market, the Interim Agreement included important concessions, with a progressive opening of the Croatian market. About 80 percent of bilateral trade between the European Union and Croatia was liberalized upon the entry into force of the Interim Agreement, with a subsequent further liberalization of some 16 percent by 2005 and full liberalization by 2008.

In February 2003, Croatia applied for EU membership and was granted candidate status in June 2004. The accession negotiation process started on October 3, 2005. By the end of 2008, negotiations were opened on twenty-two of thirty-five chapters, whereas seven chapters were closed temporarily. Although the process seems rather slow compared to initial expectations, the Croatian government still declares that negotiations will be concluded in 2009 (MFAEI 2009).

Croatia is a small economy with a population of 4.4 million people and a gross domestic product (GDP) amounting to €31 billion in 2005 at current prices. The Croatian economy has performed quite well in the past decade, with GDP rising over 40 percent in the period 1996–2005; during the period 2001–5, the GDP growth rate reached 4.7 percent. As a consequence, the income gap with the European Union is decreasing. GDP per capita was nearly €7,000 in 2005. In purchasing power parity (PPP) terms, this amounts to 48 percent of the EU-25 average (see Table 1). It equals 80 percent of that in the NMS-10 (NMS = new member state) and is about 30 percent higher than in Bulgaria and Romania (in PPP terms). The small population and GDP size of Croatia suggests that, with its accession, the EU-25 population would rise by merely 1 percent and total output would be enlarged by 0.3 percent.

Despite Croatia's rather strong economic growth in recent years, its export performance has been perceived as disappointing. This applies primarily to goods exports, which, as a share of GDP, equaled 23 percent in 2005. Compared to other countries and regions shown in Table 2, this is rather low. The small size of the Croatian economy could imply much higher trade openness. Nevertheless, due to high exports of services (tourism), Croatian exports are close to 50 percent as share of GDP if both goods and services are accounted for. That is slightly lower than it is for new EU member states in Central and Eastern Europe.

In 2005, the share of EU-15 goods exports to Croatia amounted to a negligible 0.3 percent, whereas close to half of Croatia's goods exports went to the EU-15

Table 1

Key Economic Indicators for Croatia in 2005, Compared with Other Regions and Countries

	Population (millions)	GDP (billions of euros)	GDP per capita (PPP, in percent of EU-25)
EU-25	461.5	10,949.5	100.0
EU-15	387.4	10,288.0	108.2
NMS-10	74.4	560.7	59.5
Bulgaria	7.8	21.4	32.9
Romania	21.7	79.3	34.1
Croatia	4.4	30.9	48.0

Source: Eurostat (2006).

markets. Italy and Germany are the leading trade partners, with 21 percent and 11 percent of total goods exports, respectively. When the EU-25 is considered, the share of Croatian exports rises to 62 percent of the total goods exports.

Table 3 indicates total value added across fifteen different sectors based on 2001 data originating from the Global Trade Analysis Project (GTAP) database, version 6. The Croatian economy has a relatively large share of value added in service sectors. Due to favorable natural resources, including an extensive coastline, tourism is one of the most important sectors of the Croatian economy. However, according to the classification used in the GTAP database, tourism is not treated separately, but is mainly part of both trade and transport services. Trade services include wholesale and retail trade as well as hotels and restaurants and are, according to the share in total value added, as important in Croatia as in the EU-15 and NMS-10, but significantly more important than in Romania and Bulgaria. Transport services are relatively more important in Croatia than in other economies. Altogether, the share of value added in services is about 65 percent.

The agricultural sector comprises 8.3 percent of total value added, which is a large share compared to the EU-15 but much lower than in Bulgaria and Romania. The contributions of most manufacturing sectors are rather low.³

Table 4 shows the share of exports in total production as well as the share of exports of the fifteen sectors in total exports. Services are highly important for Croatian exports, comprising more than 45 percent of total exports; worldwide, services are 20 percent of all trade on average, and for the European Union, the share is slightly larger (see Table 3). In addition, manufacturing sectors such as textiles, wearing apparel, metals, and transport equipment show a high degree of openness. However, the share of these sectors in total exports is relatively low.

Table 2

Trade Openness in 2005

	Exports of goods and services (percent of GDP)	Exports of goods (percent of GDP)	Share of exports to Croatia (percent total goods exports)	Share of exports to EU-25 (percent total goods exports)
EU-25	37.0	29.4	0.4	
EU-15	36.4	28.9	0.3	
NMS-10	54.7	44.4	1.3	
Bulgaria	60.1	44.0	1.1	56.4
Romania	33.2	28.1	1.0	69.4
Croatia	49.3	22.8	—	61.9

Sources: Eurostat and Central Bureau of Statistics of Croatia.

Note: In case of EU-15 and EU-25, exports refer to intra and extra exports.

Table 3

Value Added Across Sectors in Percent of Total Value Added, 2001

	Croatia	Bulgaria	Romania	NMS-10	EU-15
Agriculture	8.3	26.7	17.2	5.3	2.2
Energy	0.3	6.9	6.2	3.3	2.0
Food processing	4.0	9.2	12.7	5.4	2.8
Textiles	0.3	3.1	1.5	1.1	0.5
Apparel	1.0	0.8	4.6	1.4	0.4
Chemicals and minerals	3.3	7.1	4.0	5.0	4.2
Other manufacturing	3.9	2.7	4.5	4.9	3.6
Metals	0.2	2.5	1.1	2.0	0.9
Machinery and equipment	5.2	4.2	4.9	8.3	7.1
Transport equipment	0.8	0.5	2.3	2.4	2.4
Transport services	10.4	5.8	7.1	5.5	4.6
Trade services	11.8	4.0	6.1	12.2	12.7
Business services	15.7	20.4	17.2	16.9	18.7
Other services	26.9	3.8	4.5	19.7	32.0
Construction	8.0	2.3	6.0	6.7	5.9

Sources: Dimaranan and McDougall (2004) and authors' calculations.

Table 4

Exports Share and Openness by Sector in Croatia, 2001

	Exports as percent of production	Exports as percent of total exports
Agriculture	7.1	2.4
Energy	8.0	0.7
Food processing	14.9	4.6
Textiles	88.6	2.0
Apparel	79.3	3.2
Chemicals and minerals	45.9	10.0
Other manufacturing	34.0	8.0
Metals	57.9	2.1
Machinery and equipment	36.8	11.5
Transport equipment	75.8	7.9
Transport services	33.1	17.9
Trade services	7.2	3.6
Business services	35.6	21.1
Other services	5.3	2.9
Construction	1.3	0.6

Sources: Dimaranan and McDougall (2004) and authors' calculations.

Croatia's Accession to the European Union*Croatia's Development Without Accession*

How would the Croatian economy develop over the next twenty years if the country did not accede to the European Union? One could imagine different scenarios. Croatia could further integrate economically with the European Union without becoming a full member. In that case, the current free trade area might be further deepened or Croatia might become a part of the internal market, as are European Free Trade Association (EFTA) countries such as Norway and Iceland. This uncertainty about future developments in the absence of EU accession renders it difficult to assess the economic implications of the accession itself. In model simulations, the usual approach is to develop a baseline scenario, in which the current situation is extrapolated into the future. The effect of EU accession is then determined by comparing the economic outcomes of a scenario with accession to the baseline.

In the baseline, Croatia's economic growth exceeds that of the European Union due to a catching-up process. The baseline assumes a real GDP growth rate of

4.3 percent per year in Croatia, which equals the average growth rate between 1996 and 2005. GDP per capita growth is slightly higher because of a gradually shrinking population of about 0.2 percent annually, according to the United Nations (2004). In the NMSs, growth is about 4 percent per year. GDP in the EU-15 is assumed to grow at 2.2 percent per year during the coming decades. We do not include substantial reforms in Croatian economic policy compared to today's situation.

We determine first the long-term economic outcomes in the baseline scenario and then compare them with the outcomes in a scenario including Croatian accession. We assume that Croatia becomes an EU member in 2009, but the exact date has no significant effect on long-term simulation outcomes.

But what effects do we attribute to Croatia's accession? In the next two subsections, we discuss two changes induced by Croatia's accession to the European Union: accession to the internal European market and improvement in Croatia's institutions in response to EU membership.⁴

Accession to the Internal Market

A major economic aspect of Croatia's accession to the European Union involves accession to the internal market. This will affect the economies of Croatia and EU members through trade, foreign direct investment (FDI), domestic investment, and other factors. The focus here is on the trade effects of internal market accession.

Even if a free trade area between Croatia and the European Union already exists, accession to the internal market may increase mutual trade for at least three reasons. First, administrative barriers to trade will be eliminated or at least reduced to levels comparable to those between current EU members. With fewer time delays, formalities, and other obstructions, the costs of passing customs at the border should fall. Second, accession to the internal market implies a reduction in the technical barriers to trade and other regulations. The single market reduces technical barriers by means of mutual recognition of different technical regulations, minimum requirements, and harmonization of rules. The Services Directive reduces the number of regulations hampering trade in services. Finally, risk and uncertainty will be mitigated by Croatia's accession. In particular, confidence in Croatia's political and economic stability will rise.

Lejour et al. (2004) conclude that accession to the internal market is much more important than eliminating bilateral trade tariffs and introducing common external tariffs as in a customs union for the countries from Central and Eastern Europe. That conclusion—and the existing trade agreements between Croatia and the European Union in manufacturing and agriculture—suggest that accession to the internal market is the relevant issue, and not elimination of remaining tariffs and harmonization of external tariffs. Lejour et al. (2004) measure the economic consequences of accession in two steps. First, they estimate gravity equations on the industry level for 2001. These equations are specified as

$$X_{ijs} = \alpha_s Z_{ijs} + \beta_s D_{ijs}^{EU}, \quad (1)$$

where X_{ijs} stands for the log of exports from country i to j in industry s . The vector Z_{ijs} contains several explanatory variables, including GDP (per capita) of the exporting and importing countries, the distance between the capitals of countries, a set of dummies, and the bilateral import and export tariffs between countries. The vector α_s contains the parameters we estimate for each sector. The variable D^{EU} is a dummy that equals unity if i and j are currently EU members and zero elsewhere. Our main interest is in the estimated coefficient for the EU dummy, D^{EU} . For each of the fifteen sectors, the coefficient β_s is estimated by ordinary least squares (OLS) using a cross-section of thirty-eight countries for 2001 based on the GTAP data (Dinamaran and McDougall 2004). The estimates for the EU dummy are reported in the first column of Table 5. The estimates for the other coefficients are presented in Lejour and de Mooij (2005).

Table 5 reveals that in twelve out of fifteen industries, the dummy has a positive and significant coefficient (at a 10 percent confidence level). Hence, in these sectors, bilateral trade is systematically higher if two countries are both EU members. The dummies for agriculture and food processing are among the largest. Hence, the EU internal market intensifies intraregional trade in these sectors. For textiles and wearing apparel, we also find a high and significant dummy. The dummy for energy and raw materials is negative, but insignificant. This may be due to oil being intensively traded between EU members and nonmembers. For transport equipment and other services, we also find an insignificant EU dummy. This suggests that, in these sectors, trade among EU members is not significantly more intense compared to two otherwise equivalent countries that are not both EU members. The insignificant dummies may refer to either industries where the internal market has not yet progressed much or where technical barriers to trade are unimportant.

The second column of Table 5 shows the trade increase that corresponds to the estimated EU dummy. We assume that EU membership implies that the dummy would change from zero to one for bilateral trade patterns between the European Union and Croatia. To illustrate, the coefficient for the EU dummy in wearing apparel is equal to 0.49, so that the potential trade is $\exp(0.49) = 1.64$. This implies that the potential trade increase between the European Union and Croatia is 64 percent of the current trade volume. For industries with an insignificant dummy (not significant at the 10 percent level), we assume that the dummy variable is zero. Hence, accession to the internal market is assumed to have no effect on trade. Overall, estimates suggest that a weighted average of trade increases by 34 percent. Aggregate trade with the European Union could rise by this percentage if Croatia were a full EU member, as compared to the situation in 2001. Flam (2003) arrives at an estimate of 45 percent by estimating a macro gravity equation on the basis of a panel of fifteen countries for the period 1990–2000. Baldwin et al. (1997) and Brenton and Gros (1997) find an increase in bilateral trade between EU members of about 30 percent and Fidrmuc and Fidrmuc (2003) report a 40 percent increase also using macro data.

Table 5

Trade Increase and Corresponding NTB Per Sector on the Basis of EU-Dummy

	EU-dummy	Trade increase in percent	Nontariff barrier
Agriculture	0.75**	112	16
Business services (including communication)	0.56**	75	17
Construction	0.23*	27	8
Chemicals and minerals	0.34**	41	7
Energy and raw materials	-0.04	0	0
Food processing	0.81**	124	17
Machinery and electronic equipment	0.16*	18	4
Metals	0.20*	22	4
Other manufacturing	0.25**	28	5
Other services	-0.10	0	0
Textiles	0.58**	78	12
Transport services	0.14*	15	3
Trade services	0.81**	124	24
Transport equipment	0.05	0	0
Apparel	0.49**	64	10
All sectors	0.29**	34	

Source: Lejour and de Mooij (2005).

** Significant at the 5 percent level; * significant at the 10 percent level.

After having determined the potential trade increase per sector, the next step is to translate this into nontariff barriers (NTBs). These are presented in the third column of Table 5. Following the methodology of Lejour et al. (2004), we translate the potential trade increase per sector into a Samuelsonian iceberg trade cost equivalent. We refer to this as an NTB. In particular, we recalibrate the Armington demand functions in the model (i.e., the preference parameters in the utility functions) such that these reproduce the original trade data (incorporating NTBs). Abolishing NTBs for all sectors in our CGE model (discussed in more detail below), we arrive at the trade levels that correspond to the predictions in the second column of Table 5. The estimated NTBs depend largely on the sector-specific Armington elasticities in the model, which measure the sensitivity of exports with respect to trade costs. The

NTBs in the last column of Table 5 can be interpreted as the trade costs associated with Croatia's nonmembership in the internal market.

We call these trade costs NTBs and map them into one NTB indicator for technical reasons. However, in reality these trade costs are quite diverse. Simplified customs procedures facilitate trade and lower costs. Standardizing technical regulation is called a technical barrier to trade, which could lower costs but also eliminate rents. In the simulation model, these trade costs are lumped together in one NTB, which creates rents.

Improving Institutions in Croatia

In their study of the effects of possible Turkish EU membership, Lejour and de Mooij (2005) argue that EU accession may catalyze institutional reforms. In becoming an EU member, the candidate country has to conform to all EU legislation and enforcement by the European Court of Justice. Moreover, through the method of open coordination, the European Commission and other member states regularly assess the economic policies of individual member countries. EU membership can thus trigger institutional reforms in Croatia and reduce bureaucracy as well as lack of transparency on government regulation and policy implementation. Today, inefficient institutions and nontransparent practices hinder economic transactions substantially. As a result, Croatia ranks low on the Transparency Index, which measures corruption perception (see Table 6). The index, constructed by Transparency International, represents the degree of corruption perceived by professionals, academics, and risk analysts. The assessment is between 0 and 10. In 2006, Haiti scored lowest with an index of 1.8 and Finland, Iceland, and New Zealand highest with 9.6. For new member states, such as Estonia and Slovenia, the index exceeds 6, comparable to some old EU member states. The other NMSs score lower, but Hungary, the Czech Republic, and Poland score higher than the candidate countries.

Improvements in institutions and transparency may benefit the economic development of Croatia by improving its competitive position. To illustrate, De Groot et al. (2004) show that a similar law or regulatory framework as in the European Union could increase bilateral trade between 12 percent and 18 percent, and better-quality institutions and less corruption would increase trade by 17 percent to 27 percent. The Organization for Economic Cooperation and Development (OECD 2006) has pleaded for regulatory reform and enforcement of anticorruption measures in southeastern Europe to stimulate inward FDI. Enforcement is a major issue, as is the improvement of tax administration. Although we cannot explicitly attribute the extent to which the EU membership will actually improve institutions in Croatia, it is clear that these have to be reformed to conform to the internal EU market and the *acquis communautaire*. Croatia could reform its institutions without becoming an EU member, but the possible EU membership will undoubtedly be an extra stimulus to carry out such changes.

Table 6

Transparency International Perceptions Corruption Index 2006 for a Selection of Countries, Including Their Ranking

Ranking of countries	Corruption Perceptions Index 2006*
1. Finland/Iceland/New Zealand	9.6
4. Denmark	9.5
9. Netherlands/Australia	8.7
11. United Kingdom/Luxembourg/Austria	8.6
16. Germany	8.0
26. Portugal/Macao	6.6
28. Slovenia	6.4
41. Hungary	5.2
54. Greece	4.4
60. Turkey	3.8
64. Croatia	3.4
90. Serbia/Gabon/Surinam	3.0
163. Haiti	1.8

Source: www.transparency.org.

* Degree of corruption, perceived by business people, academics, and risk analysts derived from surveys. The assessment is between 0 (highly corrupt) and 10 (highly clean).

To illustrate the importance of national institutional reforms, we have assessed the importance of institutions for trade relations. Lejour and De Mooij (2005) have reestimated the gravity equation on aggregate trade of the previous section by including a multiplicative construct of the Transparency International Corruption Perceptions Index for the exporting and importing country in Equation (1). The coefficient for this index in the gravity equation measures the systematic effect of corruption on the intensity of bilateral trade between countries.⁵ To gauge the quantitative importance of institutions for trade, we suppose that by improving institutions, Croatia's EU membership would raise the TI Corruption Perceptions Index to a level comparable with Portugal—that is, Croatia would advance from sixty-ninth place, with an index of 3.4, to twenty-sixth place, with a value of 6.6. By doing so, we find that Croatia's aggregate trade would rise by 56 percent. Compared to the EU dummy for the internal market, which induces a rise in bilateral trade between Croatia and the European Union by 34 percent—suggesting an increase in aggregate trade of around 23 percent (the EU share in Croatian trade is about 65

percent)—the effect of less corruption would be much bigger. If EU membership were to catalyze institutional reforms, it would have potentially important economic implications for Croatia.

As we do for the trade effect of the internal market, we translate the trade increase according to the gravity equation technically into an NTB associated with corruption. We then follow the same procedure as above, simulating the gradual removal of the NTB to reflect a gradual improvement in the quality of institutions in Croatia.⁶ It could also be that improving institutions affects the Croatian economy directly, as markets become more transparent and function more smoothly. Then production and consumption increase directly without more trade. We do not account for this effect in our analysis.

Other Issues

The EU budget redistributes funds. Contributions are more or less proportional to countries' gross national product (GNP). EU expenditures are primarily directed to the Common Agricultural Policy (CAP) and Cohesion Policy, though the budget for these policies is sometimes heavily disputed. Especially the latter expenditure category is geared toward poor countries and regions.

Being a relatively poor country with a relatively large agricultural sector (compared to the EU average), Croatia would probably be eligible for a substantial net inflow of funds from the EU budget. Most Croatian regions would become eligible for structural convergence support under the current rules. Although these transfers are capped at a maximum of 4 percent of a region's GDP, the total amount of funds to Croatia may run up to about 1 billion euros per year. This may encourage economic growth. The meta analysis of Ederveen et al. (2002) on the growth elasticity of structural funds reveals that the potential growth effect of structural funds equal to 4 percent of GDP may be 0.7 percent per year.⁷ This, however, assumes that funds are spent appropriately on public investment projects with a high rate of return. Yet the rules regarding the allocation of EU funds are unlikely to remain unchanged. As it is difficult to predict what these reforms will look like, we do not attempt to address this issue any further.

The free movement of labor is a widely debated topic, as in 2004 and 2007, the European Union included many countries with relatively low income levels. The massive influx of Polish workers in several EU countries and the expected inflow of Turkish workers if Turkey joins the European Union have caused many concerns. Migration is less relevant to Croatia's possible EU membership: Croatia is a small country compared to the acceded countries in Central and Eastern Europe and Turkey. Even if 3 to 4 percent of the Croatian population migrated to current member states, the effects on the European Union would be modest. The EU population would increase by less than 0.1 percent and the economic effects will even be smaller. Moreover, income per capita in Croatia is higher than it is in Bulgaria, Romania, and Turkey, suggesting that the incentives to migrate are

smaller. The Croatian CBS (2006b) even expects a net migration inflow. For these reasons, we do not analyze the free movement of labor.

A large part of Croatia's exports are driven by the tourist sector. Consequently, a substantial portion of economic growth in Croatia is caused by the upsurge in tourism. As explained above, tourism is not a sector in the policy reform analysis due to the classification of the sectoral data used in this study. It is difficult to address the consequences of EU membership for tourism, though generally speaking, it would improve the image of Croatia and thereby its attractiveness as a tourist destination. In addition, EU membership could stimulate inward FDI in transport, hotels, and restaurants. It could initiate other developments, such as Croatia's inclusion in the Schengen area and the acceptance of the euro. These future developments could facilitate tourism but are outside the scope of this analysis.

The Economic Effect of Croatia's Accession to the European Union

This section explores the economic implications of Croatia's accession to the internal market and the potential improvement in national institutions. We do this by simulating two experiments with the WorldScan model. The policy shocks are implemented gradually and the effects are evaluated for the year 2025. For each of these experiments, we discuss the macroeconomic effects and sectoral implications. Before elaborating on the results of these two simulations, we first briefly sketch the model structure.

The WorldScan Model

WorldScan is a CGE model for the world economy (Lejour et al. 2006). The model is calibrated on the basis of the GTAP database, version 6 (Dimaranan and McDougall 2004) with 2001 as the base year. The database allows us to distinguish among a large number of regions and sectors, dividing the European Union into six regions: Germany, France, the United Kingdom, the Netherlands, Italy, and the rest of the European Union. The countries that acceded to the European Union in 2004 and 2007 (NMS-10, Bulgaria, and Romania) are referred to as the NMS-12. Candidate countries Croatia and Turkey are distinguished separately. The rest of the world economy is divided further into four other regions, namely, the former Soviet Union, the rest of the OECD, the Middle East and North Africa, and the rest of the world. For each region, we distinguish fifteen sectors, consisting of agriculture, raw materials and energy, eight manufacturing sectors, and five service sectors.

The heart of the WorldScan model relies on neoclassical theories of growth and international trade. Sectoral production technologies are modeled as nested constant elasticity of substitution (CES) functions. One of the nests is value added. The production of value added is modeled by means of a Cobb–Douglas technology with low- and high-skilled labor and capital as inputs. In principle, there are

fifteen intermediate inputs. However, only a few intermediate inputs are important to the production processes of most industries.

With respect to trade, WorldScan adopts an Armington specification, explaining two-way trade between regions and allowing market power for each region. The demand elasticity for manufacturing industries is set at 5.6. For service industries, the elasticity is set at 4.0. On the capital market, WorldScan assumes imperfect capital mobility across borders: Capital that is abundant in one region (and thus relatively inexpensive) is invested in another region in which capital is scarce (and thus expensive). Due to barriers to investing abroad, interest rate differentials are reduced but not eliminated. Consumption patterns may differ across countries and depend on per capita income. We assume that the labor markets for low- and high-skilled workers clear. In the baseline, labor does not migrate.

Although WorldScan rather comprehensively describes trade relations and contains a detailed description of countries and sectors, it does not capture some economic mechanisms that are potentially important in the light of EU enlargement. The version of the model does not include economies of scale; economic integration may yield additional efficiency gains through better exploiting these potential scale effects. Moreover, the model does not capture technology and knowledge spillovers, associated with the increasing trade intensity between Croatia and the European Union. Such spillovers, as well as other dynamic gains from economic integration, may yield additional benefits. The simulations thus only capture the static allocative efficiency gains from EU accession.

Croatia's Accession to the Internal Market

We now discuss the simulation results of Croatia's accession to the internal market. In particular, we simulate a gradual abolishment of the NTBs presented in Table 5. This removal of NTBs changes relative prices, exerts trade creation and trade diversion, changes the terms of trade, and affects incentives to invest.

Except for not eliminating NTBs, we also eliminate the EU export subsidies in food products toward Croatia and include changes in import tariffs levied by Croatia to comply with the EU external import tariffs. Separate simulations of these last two items reveal that the total effects of the internal market are nearly completely driven by abolishing the NTBs. Therefore, we discuss only the effects caused by eliminating the NTBs.

Table 7 presents the macroeconomic effects of Croatia's accession to the internal market. GDP and consumption in Croatia increase by 1.1 percent and 2.6 percent, respectively. Welfare, measured by the equivalent variation—that is, a measure for the rise in real private income—increases by €1.1 billion in constant prices.⁸ For the EU-15, the economic effects are negligible. Welfare rises by €0.7 billion; expressed in percentage changes of GDP and consumption, this increase is not visible. The NMS-12 countries also experience no significant effect on GDP, but an increase in welfare of €0.2 billion. These effects are the result of two main mechanisms. First,

Table 7

Macroeconomic Effects of Croatia's Accession to the Internal Market in 2025

	Volume of GDP (percent)	Volume of consumption (percent)	Equivalent variation (billions of euros)	Export volume (percent)	Terms of trade (percent)
Croatia	1.1	2.6	1.1	13.9	3.3
NMS-12	0.0	0.0	0.2	0.1	0.0
EU-15	0.0	0.0	0.7	0.0	0.0
EU-27	0.0	0.0	0.9	0.0	0.0

Source: WorldScan simulations.

Note: The numbers are percentage changes between the policy simulation and the baseline in 2025, except for the equivalent variation, which is an absolute difference.

changes in relative prices imply that countries can better exploit their comparative advantages. This creates trade, increases production efficiency, and raises welfare. At the same time, however, integration with Croatia diverts trade, but this effect is very small. The second effect on Croatia's accession to the European Union is in terms of trade. It is not a traditional terms-of-trade effect, but the result of a change in transaction costs, modeled by a change in the Samuelsonian iceberg costs; under it, Croatia experiences a terms-of-trade gain of 3.3 percent. This is not accompanied by a terms-of-trade loss in other European countries. The reason for the presence of terms-of-trade gains on both sides is that abolishing NTBs entails reducing real trade costs. As we measure the terms of trade, as the price of exports relative to imports that holds just outside the domestic border, lower NTBs can raise the price of exports relative to imports in both countries.⁹ The different magnitude in the terms-of-trade effect among countries depends on the trade intensity between that country and Croatia. The export shares of the NMS-12 and the EU-15 to Croatia are rather small, whereas the corresponding share of Croatia's exports to the European Union is relatively large. This explains the large terms-of-trade effect for Croatia relative to the other regions.

We compare the effects in Table 7 with those of Lejour et al. (2004) for Central and East European countries and of Lejour and de Mooij (2005) for Turkey. These simulations were also performed with the WorldScan model. The EU enlargement with Central and Eastern European countries yields an average increase in GDP of 5.3 percent for the accession countries; consumption increases by almost 10 percent. For Croatia, the figures are 1.1 percent and 2.6 percent, respectively. These results are comparable to those of Turkish accession: 0.8 percent and 1.4 percent, respectively. The reason for the differences with Central and East European countries is threefold.¹⁰ First, we have reestimated our gravity equations on the basis of more recent data for 2001. The new estimations suggest an aggregate trade increase for EU bilateral trade with Croatia of 34 percent. This is about one-third smaller than the increase of more than 50 percent for the Central and East European countries suggested by the previous estimate, which was based on data for 1997. Second, as does Turkey, Croatia specializes in sectors for which we find relatively small effects for the internal market EU dummy. We do not obtain a significant NTB for transport, a sector that is relatively important for the Croatian economy (see Table 3). We find a large NTB in the trade services sector, which is important for Croatia, but trade in that sector is low (see Table 4) and the trade increase has no substantial effect on production in that sector. Finally, the export increase of Croatia primarily involves sectors with relatively low productivity, such as textiles and apparel. Although these sectors benefit substantially (see Table 8), this does not create large effects on value added and consumption.

Croatia's total exports rise by 13.9 percent and its imports by 15.9 percent. This is less than expected based on the gravity equation. According to the latter method, aggregate trade would rise by about 23 percent. There are several reasons for this difference. First, there is also trade diversion. Increased trade with the European

Table 8

Sectoral Effects of Croatia's Accession to the Internal Market in 2025
(numbers are relative changes in production)

	Croatia	NMS-12	EU-15
Agriculture	-1.1	0.1	0.0
Energy	0.5	0.0	0.0
Food processing	-3.1	0.1	0.0
Textiles	66.4	-0.1	0.1
Wearing apparel	30.2	-0.2	0.0
Chemicals and minerals	7	0.0	-0.0
Other manufacturing	3	0.0	-0.0
Metals	9.2	0.1	0.0
Machinery and equipment	4.6	0.0	0.0
Transport equipment	2.7	0.0	0.0
Transport services	-0.2	-0.0	0.0
Trade services	1.2	-0.0	-0.0
Business services	-1.3	-0.0	0.0
Other services (mainly government)	-1.3	0.0	0.0
Construction	0.2	0.0	0.0

Source: WorldScan simulations.

Note: The numbers are percentage changes between the policy simulation and the base-line in 2025.

Union leads to less trade with other countries. This reduces the increase in total trade. Second, Croatia also needs (skilled) labor, capital, and intermediate inputs, such as machinery and equipment, for production, and the scarcity of these inputs reduces the trade potential.

To understand the sectoral effects of Croatia's accession to the internal market, two effects in each sector are important. First, an industry for which an NTB is abolished faces fiercer price competition on the home market as the relative price of varieties from the European Union falls relative to domestic varieties. This causes a shift in consumer demand away from domestic varieties, leading to higher import intensity. The drop in demand for domestically produced commodities lowers the producer price, which causes a shift in resources away from the sector in which the NTB is abolished. The second effect is that the European Union lowers its NTBs. This reduces the relative consumer price of Croatia's varieties in the European Union, causing a higher demand for these varieties and exerting upward pressure on Croatia's producer price, which attracts inputs to this sector.

Increased specialization is the net result of these two opposite effects on prices and production in a sector. On balance, a sector is likely to expand if that sector exports a large share of its production to the European Union. If a sector produces primarily for the home market, cheaper EU varieties may render the effect on production in that sector negative.

In addition to the two demand effects above, the removal of NTBs exerts a supply effect. This is because the reduction in real trade costs changes input prices for two reasons. First, lower real trade costs reduce the price of intermediate inputs so that production costs fall. Second, production costs also change by changes in relative factor prices.

How all these forces work out depends on the details of the input–output structure of the economy, comparative advantages, and the trade openness of sectors. A CGE model such as WorldScan consistently links these elements and shows how the various shocks and mechanisms ultimately affect the output structure. Table 8 presents the results. It reveals that the textiles and wearing apparel sectors expand the most, due to their strong export orientation and the relatively large NTB that is abolished. However, these sectors only contribute about 5 percent to Croatia's exports and 1.3 percent to value added. The effect of increased access to the EU market dominates the effect of cheaper EU products in Croatia. Other sectors in Croatia also gain. Table 8 shows modest increases in the other manufacturing sectors (except food processing), trade services, and construction. Production contracts in business and other services and agriculture.

Expanding Croatia's textile and wearing apparel sectors slightly affects the position of these industries in the NMS-12. Some workers shift from these sectors toward agriculture, food processing, and metals, which show a corresponding increase in production.

Institutional Reforms in Croatia

The second effect of Croatia's EU accession involves the potential improvement in national institutions, to the extent that EU membership triggers reforms. We simulate institutional reforms by an improvement in Croatia's position toward the level of Portugal. Probably such a change will take decades, because institutions do not change that fast in most countries. Croatia jumps from sixty-ninth to twenty-sixth place—from 3.4 to 6.6 points—on the Transparency International Corruption Perceptions Index. As found in the gravity equation estimates above, aggregate trade could increase by 56 percent. This trade increase only measures the effects of improved institutions and excludes accession to the internal market dealt with in the previous section.

Table 9 shows that an improvement in institutions raises GDP in Croatia by 7.8 percent, whereas consumption rises by 12.9 percent. Welfare increases by 5.6 billion euros in constant prices. The consumption increase is much larger than the GDP increase because the terms of trade improve due to reduced NTBs. The reduction

Table 9

Macroeconomic Effects of a Higher TI Corruption Perceptions Index for Croatia in 2025

	Volume of GDP (percent)	Volume of consumption (percent)	Equivalent variation (billions of euros)	Export volume (percent)	Terms of trade (percent)
Croatia	7.8	12.9	5.6	56.9	9.9
NMS-12	0.0	0.1	0.4	0.4	0.1
EU-15	0.0	0.0	1.8	0.1	0.0
EU-27	0.0	0.0	2.2	0.1	0.0

Source: WorldScan simulations.

Note: The numbers are percentage changes between the policy simulation and the baseline in 2025, except for the equivalent variation, which is an absolute difference.

Table 10

Sectoral Effects of a Higher TI Corruption Perceptions Index for Croatia in 2025 (numbers are relative changes in production)

Sector	Trade increase
Agriculture	1.4
Energy	4.8
Food processing	2.2
Textiles	89.2
Apparel	33.8
Chemicals and minerals	37.8
Other manufacturing	11
Metals	67.2
Machinery and equipment	34.9
Transport equipment	48.8
Transport services	11
Trade services	8.6
Business services	-3.9
Other services	-15.6
Construction	5.2

Source: WorldScan simulations.

Note: The numbers are relative differences between the policy simulation and the baseline in 2025.

of the NTBs as a way to simulate improved institutions is a kind of mechanical exercise, making it more difficult to interpret the difference between the consumption and GDP increase.

These macroeconomic effects are substantially larger than the effect of the accession to the internal market. This is so for two reasons. First, the estimated trade effect of the improvement in the corruption index is larger than that of the accession to the internal market: The aggregate trade increase is more than three times larger. Second, the improvement in institutions affects all sectors alike, including trade-intensive sectors such as chemicals, metals, transport equipment and machinery and equipment (see Table 10). This contrasts with the simulation for the internal market, in which these sectors were only mildly affected.

Other countries are hardly affected by the improvements in Croatia's institutions. Exports from the twelve new member states increase by 0.4 percent. The equivalent variation suggests that the entire European Union experiences a welfare gain equivalent to €2.2 billion in constant prices.

Although the institutional improvement potentially has an important economic effect for Croatia, these gains will only materialize if the accession of Croatia to the European Union induces such improvements. However, such changes in institutional settings normally take decades. In case the reforms are less fundamental, the Croatian position on the corruption perceptions index ladder improves less. To illustrate, if Croatia climbs up to forty-second place—the level of a new member state, Hungary—aggregate trade increases by about 28 percent. This is around half of the trade increase if Croatia moves to the twenty-sixth position of Portugal. Macroeconomic effects are also about 50 percent smaller.

Conclusions

With the accession of Romania and Bulgaria in 2007, the European Union has expanded toward southeastern Europe. Many countries in this region aspire to join the European Union. Croatia, Macedonia, and Turkey already have candidate status, whereas Albania, Bosnia and Herzegovina, Serbia, and Montenegro participate to a different extent in the Stabilization and Association Process, which provides a legal framework for relations between the European Union and potential members. These partnerships are often seen as a first step toward closer integration, though they do not guarantee full membership. Apart from Turkey, all these countries are small in terms of population and the size of the economy compared to the European Union. Thus, the current study on the economic consequences of EU membership for Croatia holds some interesting conclusions that could also be valid for other countries in southeastern Europe.

First, the EU economy would be hardly affected. Welfare could increase by €3.1 billion, or less than 0.1 percent of GDP. This conclusion also holds for other EU candidates or countries that have recently become full members. Studies on the membership effects of the Central and East European countries and Turkey indicate that the effects on the existing EU members are small, but still substantially larger than in the case of Croatia.

Second, the economy of the accession country—in this case, Croatia—is heavily affected. GDP could increase by about 9 percent and consumption even more if Croatia enters the internal market and improves its institutions toward the level of Portugal. This stimulus is also possible for other countries in southeastern Europe, given their level of economic development and institutional settings. However, institutional improvement has to be interpreted as an upper bound and is not likely to be met within one or two decades.

The analysis probably does not present the total effects of accession. First, FDI effects are not considered. EU membership gives foreign investors confidence, although OECD (2006) shows that this has to be accompanied by measures to reduce corruption and improve tax administration. Moreover, EU membership could make Croatia more attractive as a tourist destination. Third, the type of analysis undertaken underestimates the dynamic effects of integration. Increased market

entry and improved institutions facilitate competition. Although this process is sometimes painful because less efficient firms disappear, on average, it increases productivity and stimulates innovation. Lejour et al. (2009) conduct a two-stage econometric analysis to investigate the long-term effects of EU accession on trade and growth. They also account for the effects of improved institutions and conclude that, for the twelve new EU member states plus Turkey, income could increase by about 38 percent on average. However, it will take many decades before an increase of this magnitude will be realized in these countries—at least much longer than the time horizon of this study, 2025. That analysis does not focus on Croatia, but a stimulus of this magnitude could be reached in that country. However, one important difference compared with most of the other new member states is the limited size of manufacturing in Croatia. The European experience suggests that promoting competition and raising productivity is easier in manufacturing than in services. Services are relatively important in Croatia, which suggests that deregulation and market reform policies in the service sector could be vital to grasp the full economic gains of possible EU membership.

Notes

1. Stabilization and Association Agreement, available at http://ec.europa.eu/enlargement/key_documents/sap_en.htm.

2. Interim Agreement, available at www.mvpei.hr/ei/download/2001/09/12/Interim_Agreement.pdf.

3. Croatian statistical sources suggest some differences regarding the importance of certain sectors. This primarily refers to the energy sector, which, according to Croatian sources, contributes with 6 percent to total valued added (as opposed to GTAP data that suggest 0.3 percent). The value-added share of construction is according to Croatian sources by about 3 percentage points lower than according to GTAP data (CBS 2006a).

4. Both subsections are based on Lejour and De Mooij (2005).

5. The coefficient for the EU dummy, measuring the effect of the internal market on trade intensities, does not significantly change if we add the TI index.

6. Because we do not have information on the effect of institutional changes on sectoral trade patterns, we assume that trade is affected equivalently in all sectors.

7. This figure is based on ex ante analyses of the growth effect of structural funds, using simulation models. Ex post evaluations, however, suggest zero elasticity, on average. Hence, there is substantial room for improvement in the effectiveness of structural funds in terms of stimulating convergence (see Ederveen et al. 2002).

8. In the GTAP database (version 6), all prices are expressed in U.S. dollars for the year 2001. We have used the average exchange rate for 2001 (1 U.S. dollar = 0.67281168 euros) to express all monetary values in euros (constant prices).

9. For imports, the price includes cost of freight (the iceberg costs and the c.i.f.—inclusive of cost, insurance, and freight) but not import taxes. For exports, the price is f.o.b. (free on board) and includes export taxes but excludes the iceberg costs.

10. For Turkey, the relative low share of EU trade (about 50 percent of all trade) was also reason for the modest economic effects. This does not apply to Croatia. About two-thirds of the trade is destined for or comes from the European Union. This share is comparable to that of other accession countries.

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