

# **Turkish delight: assessing the economic benefits of Turkey's accession to the EU**

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## **ABSTRACT**

This paper explores the economic consequences of the enlargement of the European Union with Turkey. Following Lejour et al., we adopt a gravity approach to estimate existing trade barriers between the EU and Turkey. We then adopt a CGE model for the world economy, called WorldScan, to explore the economic implications of removing these trade barriers. This reflects the Turkish accession to the internal market. In this way, the economic implications for fifteen industries in several European countries are assessed. We also elaborate on the implications of immigration flows from Turkey for European labour markets.

## 1 Introduction

The European Union is about to enlarge with eight new Member States from Central and Eastern Europe and the two Island states Cyprus and Malta. Further enlargement is foreseen after 2004 with other candidate Member States. In particular, the EU is already negotiating with Bulgaria and Romania on the terms and date of accession. Turkey is acknowledged as a candidate and, although negotiations have not started yet, the EU has promised that a starting date for the negotiations will be agreed upon in 2004. Another possible candidate, which does not yet has a formal status, is Croatia.

This paper explores the economic consequences of the EU accession to the European Union beyond the next enlargement of 2004. A number of studies have explored the economic effects of the enlargement of the EU with the Central and Eastern European countries, who are about to accede. Table 1.1 shows the results according to five of them for GDP per capita. The table reveals that accession to the EU will yields substantial gains for the new Member States. For EU countries, the effects will be modest but positive. We are not aware of studies on the possible accession of Turkey to the EU.

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**Table 1.1 Long-term effects of EU-enlargement for GDP per capita (in %) according to 5 studies**

	Effects EU	Effects CEEC
Baldwin e.a., 1997	0,2	1,5
Brown e.a., 1997	0,1	3,8
Europese Commission, 2001	0,2 - 0,4	
Lejour e.a., 2001	0,1	7,8
Breuss, 2001	0,2	7,2

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The enlargement with other Member States, Croatia, Bulgaria, Romania and Turkey, is likely to yield similar effects on the economies. Yet, it may be interesting to explore these effects in more detail for a number of reasons. First, the effects may differ from the results in table 1.1 because countries differ with respect to their degree of openness, their sectoral structure, the importance of current trade barriers and their different levels of welfare. Second, it is interesting to explore how further enlargement affects the economies of countries that accede to the EU in 2004. In particular, as the two groups of countries tend to specialize their exports in similar products, the Central and Eastern European countries may lose from further enlargement of the EU, at least in some sectors.

This paper follows the approach of Lejour et al. (2001) to explore the economic effects of the accession of four new Members to the EU in the future. In particular, for 15 different industries, we derive the potential trade between the EU and the four new entrants from gravity equations. The estimates provide an indication of trade flows when countries are a full member of the EU. Comparing this potential trade with actual trade, we can derive an estimate of the tariff

equivalent of the barriers to trade. These barriers are then assumed to be removed when countries accede to the EU. We then adopt a CGE model for the world economy, called WorldScan, to explore the implications of EU enlargement. The model, makes an explicit distinction between six regions in the EU and the accession countries Bulgaria, Croatia, Romania and Turkey. Moreover, it distinguishes between 15 industries so that we are able to explore which industries will be most affected. In addition to this, we analyse the potential migration flows following the accession to the EU and their implications for labour markets.

The rest of this paper is organised as follows. Section 2 discusses the main features of the WorldScan model. Section 3 demonstrates the shock of EU-accession in two dimensions: the accession to the internal EU market and free movement of labour. Section 4 analyses the implication of these shocks for both the EU, the Central and Eastern European countries, and the new accession countries. Finally, section 6 concludes.

## 2 The WorldScan model

WorldScan is a computable general equilibrium model for the world economy.<sup>1</sup> The model is calibrated on the basis of the GTAP database, version 5.3 (Purdue 2001) with 1997 as the base year. The database allows us to distinguish between a large number of regions and sectors. In particular, the EU is divided into six regions: Germany, France, UK, Netherlands, Italy, and Rest EU. The countries that accede to the EU in 2004 are referred to as the CEEC10. Other potential accession countries are all distinguished separately, i.e. Croatia, Bulgaria, Romania and Turkey. In the rest of this paper, this group of countries is referred to as the EEC4. The rest of the world economy is divided further into three other regions, namely, the former Soviet Union, rest OECD, Middel East and North Africa, and Rest of the world (ROW). For each region, we distinguish between fifteen sectors. These consist of agriculture, energy, eight manufacturing sectors and five service sectors. As the model distinguishes only one aggregated agricultural sector, we are unable to explore the details of changes in the common agricultural policies of the EU.

The heart of the model relies on neoclassical theories of growth and international trade. Sectoral production technologies are modelled as nested CES functions. At the lower nesting, two composite inputs are produced. On the one hand, value-added is produced by combining low-skilled labour, high-skilled labour, capital and, in some sectors, a fixed factor (land in the sector agriculture and natural resources in the sector raw materials). The production of value-added is modelled by means of a Cobb-douglas technology. On the other hand, various intermediate inputs are combined to yield a second composite input. Here, we use a CES function with a substitution elasticity of 0.6. In principle, there exist fifteen intermediate

<sup>1</sup> See CPB (1999) for more details.

inputs. However, there are only a few intermediate inputs important in the production process for most industries. At the higher nesting, the two composite inputs, i.e. value-added and the composite of intermediate inputs, are combined in a CES technology to yield final output. The substitution elasticity between the two composite inputs is 0.01.

With respect to trade, WorldScan adopts an Armington specification, explaining two-way trade between regions and allowing market power of each region. The demand elasticity for manufacturing industries is set at 5.6. For services industries the elasticity is set at a lower level; for raw materials and agriculture at a higher level. In the long run, trade patterns are determined by Heckscher-Ohlin mechanisms, i.e. based on factor endowments. On the capital market, WorldScan assumes imperfect capital mobility across borders. In particular, the model includes a portfolio mechanism in which capital owners distribute their investments over regions, depending on the rates of return and the preferences for asset diversification. Consumption patterns may differ across countries and depend on per capita income. If welfare levels converge, these consumption patterns also converge towards a universal pattern. We assume that the labour markets for low-and high-skilled workers clear. In the baseline, labour does not migrate.

**Table 2.1 Characteristics of the EEC4 in 1997**

	population in millions	GDP in billion US \$	savings/GDP ratio	investment/GDP ratio
Croatia	5	16	0.08	0.25
Bulgaria	8	10	0.12	0.12
Romania	23	35	0.15	0.22
Turkey	64	191	0.20	0.26
CEEC10	75	276	0.13	0.24
EU-15	374	7928	0.20	0.19

Source: Purdue (2001)

Tables 2.1- 2.3 provide some background information about the calibration of Worldscan, especially for the EEC4. Table 2.1 reveals that enlargement with this group of four countries implies an increase in the EU population by around 100 million people. The magnitude of this enlargement exceeds that of the next enlargement with the CEEC10, which involves 75 million people. GDP will rise only by 252 billion US\$ which is less than the GDP of the CEEC10. Indeed, the EEC4 lag behind the economic development in the CEEC10. Table 2.1 also reveals that the investment/GDP ratio in the majority of the EEC4 exceeds the saving/GDP ratio. Here, Bulgaria is the exception. For the other countries, it suggests that these countries experience a trade deficit in 1997 and that a substantial part of investment is financed by foreign capital. Table 2.2 presents the export shares of the EEC4. The table reveals that the smaller countries, Croatia and Bulgaria are relatively open. Turkey is relatively closed. The EEC4 already trade a substantial share with the EU.

**Table 2.2** Export shares in % of GDP in 1997

	Total share	Share to the EU-15
Croatia	43.0	20.2
Bulgaria	60.2	28.4
Romania	26.9	14.9
Turkey	21.4	10.5
CEEC10	37.8	23.6
EU-15	27.9	15.0

Source: Purdue (2001)

Table 2.3 shows the sectoral value-added shares of Turkey and compares them with those of the CEEC10 and the EU15. It reveals that the Turkish economy features a relatively large share of value added in Agriculture, Food Processing, Textiles and Transport and Trade services, as compared to the CEEC10 and the EU15. The manufacturing sectors are relatively small in terms of value added. This may imply that the economic implications of Turkey's accession to the EU may differ from those of the CEEC10 accession.

**Table 2.3** Sectoral value-added shares in Turkey

	Turkey	CEEC10	EU15
Agriculture	14.3	7.0	2.8
Energy	2.9	4.0	1.9
Food processing	6.1	5.8	3.3
Textiles	1.4	1.0	0.6
Wearing apparel	1.0	1.4	0.5
Chemicals and minerals	4.3	5.0	4.2
Other manufacturing	2.4	4.8	3.8
Metals	1.5	1.8	0.9
Machinery and equipment	3.0	6.3	6.9
Transport equipment	0.9	1.5	2.3
Transport services	12.2	6.2	4.6
Trade services	21.1	12.1	13.2
Business services	6.5	17.2	18.7
Other services	15.0	19.8	30.5
Construction	7.4	6.1	5.8

Source: Worldscan

With the WorldScan model, we first run a baseline scenario. In this baseline, we assume that the CEEC10 indeed become EU member in 2004. Subsequently, we explore the economic implications of the enlargement beyond. In particular, this paper concentrates on the accession of Turkey to the EU in 2010. We then evaluate the equilibrium values of the benchmark

scenario with those of the alternative scenario in which Turkey has acceded to the EU.<sup>2</sup> The next section explores the changes that are induced by Turkey's accession in modelling terms.

### **3 Turkey's accession**

The EU has already agreed upon a Customs Union with Turkey. Although the formal agreements in this Customs Union might not be fully implemented, we assume that formal trade barriers are indeed removed and external tariffs equalized. This section discusses two shocks of the EU accession of Turkey: (i) accession to the internal market, and (ii) free movement of labour. We do not analyse some other potential implications of enlargement such as accession to EMU, changes in the Common Agricultural Policies of the EU, or in EU policies with respect to the Structural Funds. Section 4 will analyse the economic implications of these shocks with the WorldScan model.

#### **3.1 Accession to the internal market**

The major economic aspect of the accession of Turkey to the EU involves the accession to the internal market. This will affect the economies of the Turkey and EU members in several ways, e.g. via trade, FDI, domestic investment, etc. Our focus is on the trade effect.

Accession to the internal market may increase trade for at least three reasons. First, a number of administrative barriers to trade will be eliminated or at least reduced to levels comparable to those between current EU members. Here, one can think of reduced costs of passing customs at the frontier: less time delays, less formalities etc. Second and probably more important is the reduction in technical barriers to trade. The Single Market reduces these technical barriers by means of mutual recognition of different technical regulations, minimum requirements and harmonisation of rules and regulations.<sup>3</sup> Finally, risk and uncertainty will be mitigated by the Turkish accession to the EU. One type of risk is the possibility that somewhere in the link from producer to consumer some agent defaults. This is especially important for goods moving from East to West as export credit guarantees are less well developed in Turkey. Another is political risk, a risk more relevant for goods moving from West to East (as insurance does not cover these risks and as democracies are thought to be less stable in Turkey). These risks and uncertainties may form substantial impediments to trade.

In discussions about the accession of the CEEC10 to the EU, researchers had great difficulty in measuring the economic gains. In particular, most studies imposed a fixed reduction in

<sup>2</sup> Since non-membership of Turkey could also involve a process of disintegration with the EU, the benchmark may produce a less favourable development for the integration of Turkey and the EU. We have not, however, explored such an alternative scenario of disintegration.

<sup>3</sup> For a detailed discussion of these approaches and their effect on trade, see Brenton, et al. (2001).

overall trade costs to capture the impact of the accession to the internal market. In this paper, we follow an empirically founded approach of Lejour et al. (2001) to determine the impact of the Single Market enlargement. Their methodology is to measure the economic consequences of accession to the internal market by estimating gravity equations on the industry level.<sup>4</sup> More specifically, we follow Bergstrand (1989) in estimating the following equation:

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

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  $\alpha_s$  contains the parameters we estimate for each sector. The variable  $D^{EU}$  is a dummy that equals unity if  $i$  and  $j$  are currently members of the EU and else zero. Our main interest is in the estimated coefficient for the EU dummy,  $D^{EU}$ . For each of the 16 sectors this coefficient,  $\beta_s$ , is reported in the first column of table 3.1. It reveals that in twelve out of sixteen industries, the dummy has a positive and significant coefficient. Hence, in these sectors, bilateral trade is systematically higher if two countries are both members of the EU. The dummies for agriculture and food processing are among the largest. Hence, the internal market and the common agricultural policy in the EU intensify intra-regional trade in these sectors. For Textiles, Wearing apparel, and Trade services we also find a high and significant dummy. The dummy for energy is negative, but insignificant. This may be due to oil being intensively traded between EU members and non-members alike. For Metals, Transport Services 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 either refer to industries where the internal market has not progressed much or where technical barriers to trade are unimportant.

<sup>4</sup> The sectoral disaggregation in this research differs from that in Lejour et al. (2001).

**Table 3.1 Trade increase and corresponding NTB per sector on the basis of EU-dummy**

	EU DUMMY	Trade Increase	Non-Tariff Barrier
Agriculture	0.49	64	11
Business services (including communication)	0.40	49	12
Construction	0.39	47	12
Chemicals en minerals	0.44	55	10
Energy and raw materials	-0.35	0	0
Food processing	0.32	37	7
Machinery and electronic equipment	0.29	34	6
Metals	0.15	0	0
Other manufacturing	0.20	0	0
Other services	0.05	0	0
Textiles	0.78	119	10
Transport services	-0.03	0	0
Trade services	0.69	99	20
Transport equipment (including mtotor vehicles)	0.48	61	10
Wearing apparel	0.69	99	11

Note: the trade increase is assumed zero if the EU dummy is not significant

How to interpret these numbers? For industries with an insignificant dummy, we assume that accession to the internal market has no impact on trade. For other sectors, the dummy is used to calculate the potential trade increase. In particular, we assume that EU membership implies that the dummy would change from zero to one for bilateral trade patterns between an EU and Turkey. Thus, potential trade can be calculated as  $\exp(\beta_s)$ , where  $\beta_s$  denotes the estimated coefficient for the EU dummy in (1).<sup>5</sup> To illustrate, the coefficient for the EU dummy in Wearing apparel is equal to 0.69 so that the potential trade is  $\exp(0.69) \approx 1.99$ , i.e. almost twice the actual trade between Turkey and EU members. The potential trade increase is therefore 99%. The second column of table 3.1 reports the potential trade increases for all sectors.

After having determined the potential trade increase per sector, the next step is to translate this into non-tariff barriers. To that end, we follow a calibration procedure that differs from the standard procedure to calibrate the model. Lejour et al. (2001) report this procedure in detail. In short, to model the estimated implicit barriers, we translate the potential trade increases into a Samuelsonian iceberg trade-cost equivalent of the barriers (further non-tariff barriers: NTBs). If we abolish the NTBs in the model, we arrive at the (ex-ante) trade levels that correspond to the predictions from the gravity model. The final column of table 3.1 presents the value of these

<sup>5</sup> Bilateral exports will become  $\exp(\beta_s)$  times the initial exports if accession countries become an EU member (i.e. if  $D^{EU}$  becomes 1). From this, we subtract  $\exp(0)=1$  to arrive at the potential trade increase.



NTBs. These can be interpreted as the trade costs associated with non-membership of the internal market.

### **3.2 Free movement of labour**

Although forecasting the migration effect of the coming EU enlargement is inherently difficult, a number of researchers have made such an attempt. These studies all estimate the effect of income disparities (and other explanatory variables like unemployment or distance) on international migration from previous experiences. These estimates are then applied to the income differentials between the EU and the CEECs. Thus, they arrive at an estimate of the migration effect of EU-enlargement. We have collected twelve of such studies, the results of which are summarized in table 3.2. The figures refer to permanent migration, not to commuting or temporary migration. The estimates of the various studies cannot be readily compared, however, as they differ in the source and destination countries, and whether they predict annual flows or long-term stock of immigrants . In the last column of table 3.2, we have made an attempt to derive a comparable estimate from the various studies for the long-term stock of migrants from all CEECs to the current EU countries.<sup>6</sup> The long-term is interpreted as the migration effect after 15 years, i.e. in 2020.

<sup>6</sup> We used the migration shares for individual CEECs and EU countries from Boeri et al. (2000) to upgrade the estimates to CEEC10 - EU15 migration. To arrive at the long-term stock of migrants from studies reporting annual flows, we have applied the time-structure of immigration flows estimated by Boeri et al. (2000).

**Table 3.2 Estimates on the migration effect of EU-enlargement (flows in 1000, stock in million)**

	Source	Destination	Flow <sup>a</sup>	Stock <sup>b</sup>	Total stock <sup>c</sup>
Layard et al. (1992)	Pol, Czr, Hun, Slovak	EU15	130		2.9
Brucker&Franzmeyer (1997)	CEEC10	EU15	590		6.7
			1180		13.6
Fassmann & Hintermann (1997)	Pol, Czr, Hun, Slovak	EU15	721		1.4
Lundborg e.a. (1997)	Pol, Baltics	EU15		1.9	4.2
Huber-Pichelmann	CEEC10	EU15	140		1.6
			200		2.3
Bauer-Zimmermann (1999)	CEEC10 excl. Baltics	EU15		3	3.3
Fertig (1999)	Pol, Czr, Hun, Sloven, Est	Germany	38		1.3
Salt e.a. (1999)	Pol, Czr, Hun, Sloven, Est	EU15	41		0.9
Orlowski&Zienkowski (1999)	Pol	EU15		0.4	1.1
				1.5	4.2
Boeri e.a. (2000)	CEEC10	EU15	338	3.9	3.9
Orlowski (2000)	CEEC10	EU15		1.9	1.9
				3.5	3.5
Hille&Straubhaar (2001)	CEEC10	EU15	188		2.2
			633		7.3
Fertig&Schmidt (2000)	Pol, Czr, Hun, Sloven, Est	Germany	18		0.6
			57		2.0
Sinn&Werding (2001)	Pol, Czr, Hun, Slovak, Rom	Germany		3.2	6.1
				4	7.7
Median of sample					2.9
Median of lower estimates					1.9
Median of upper estimates					4.2

<sup>a</sup> Flow refers to the estimated flow of migrants in the first year after accession

<sup>b</sup> Stock refers to the estimated stock of migrants that migrate to the EU in the long-term

<sup>c</sup> Total stock refers to the comparable stock of migrants from the CEEC10 towards the EU15, that we obtained from the estimate in the study (see footnote 1 for details on the computation).

The median of the sample suggests that 2.9 million migrants will move towards the EU in the long term. There is, however, quite some variation among the studies. The highest estimate predicts more than 13 million immigrants while the lowest estimate is less than 1 million. The majority of estimates, however, is somewhere between 1 and 4 million.

Some of the studies in table 3.2 report more than one estimate. The lower estimate then refers to a scenario in which income disparities gradually decline so that migration pressure drops. The upper estimate refers to a scenario in which income disparities do not decline. If we group the lower and upper estimates separately, we find median values of 1.9 and 4.2 million, respectively. This range might be seen as the summary result from the empirical estimates. It corresponds to a long-term migration effect between 2% and 4% of the total population in the CEECs or, equivalently, between 0,5% and 1% of the EU population.

Would Turkey accede to the European Union, this may also induce a flow of immigration to the EU. Up to now, however, we are not aware of studies on the migration effect of the Turkish accession to the European Union. As an educated guess, we have used the implicit elasticity from the studies in table 4.5 to make such an assessment. In particular, Turkish GNP per capita measured in purchasing power parities in 1999 is 31% of the EU average, which is somewhat below the average of the CEECs. Applying the implicit wage elasticity of migration to the income differential with Turkey yields an estimate of the migration potential from Turkey to the European Union. Thereby, we take account of the demographic development in Turkey. In particular, the Turkish population is expected to increase from 65 million inhabitants in 2000 to 87 million people in 2025. Taking the Turkish population size in 2025, we obtain an expected migration from Turkey to the EU between 1.8 and 4 million (lower and upper estimates from table 3.2 applied). Applying the median of the total sample from table 3.2, we arrive at a central estimate of 2.7 million immigrants.

The destination of migrants from Turkey is not expected to be equally distributed across the European Union. In particular, the migration literature reveals that the destination of migrants primarily depends on network effects, i.e. new migrants go to places where previous migrants have settled.<sup>7</sup> Table 3.3 present the destination of migrants based on the current distribution of immigrants from Turkey in the European Union. A large share of Turkish migrants resides in Germany (76%), but France (8%) and the Netherlands (4%) also host a relatively large share of Turkish immigrants.

	in 1000	in %
Total	2.665.000	100
Germany	2.025.400	76
France	213.200	8
UK	53.300	2
Italy	26.650	1
Netherlands	106.600	4
Rest of Europe	239.850	9

Source: Trends in international migration, OECD, SOPEMI 2001 for data on current destination; own calculations for expected destination of migrants from CEECs and Turkey

<sup>7</sup> Differences in job opportunities between countries or possible transitional periods with respect to the free movement of labour, as for instance agreed upon in the negotiations between the European Commission and some of the CEECs, can redirect the destination of immigrants in the European Union.



## 4 Economic impact of Turkey's accession to the EU

This section explores the economic implications of the two shocks discussed in the previous section by running simulations with the WorldScan model. For both experiments, we consider the macroeconomic implications, namely the effects on real GDP, the volume of private consumption, and the terms of trade. The effect on private consumption is closely related to real disposable income of private households and, therefore, best reflects the welfare effects. The effect on consumption may differ from the implications for real GDP because of terms-of-trade effects, changes in wealth, and changes in saving behaviour. For the simulation of the internal market, we also analyse the sectoral implications by looking at the relative changes in production in 15 different industries. In the experiments, we assume that Turkey enters the EU in 2010. The shocks are implemented gradually and the effects are evaluated in the year 2025 in which a new stable equilibrium is achieved.

### 4.1 Accession of Turkey to the internal market

We now explore the implications of the accession to the internal market by simulating a gradual abolishment of the NTBs presented in table 3.1. The abolishment of NTBs changes relative prices, exerts trade creation and trade diversion, changes the terms-of-trade and affects the incentives to invest. In particular, NTBs reflect real trade costs, e.g. waiting time at borders or the time devoted to customs formalities. Thus, they are modelled as iceberg cost. The idea is that a share of the commodities melts away during the phase of trade. As the abolishment of NTBs thus entails a reduction in real trade costs, removing it will not imply a terms-of-trade loss but a terms-of-trade gain. More specifically, a bilateral reduction of NTBs can cause a terms-of-trade gain in both countries! To see this, note that we measure the terms of trade as the price of exports relative to imports that holds just outside the domestic border. For imports, the price includes cost of freight (the iceberg costs and the c.i.f - inclusive of cost, insurance and freight - that are present in the database) but not import taxes. For exports the price is f.o.b (free on board) and includes export taxes but excludes the iceberg costs. Lower NTBs can thus raise the price of exports relative to imports in both countries. The abolishment of NTBs is symmetric between the EU and Turkey. Hence, abolishing the iceberg tariffs implies that each sector experiences two shocks: fiercer competition on the home market as the relative price of foreign varieties falls, and a better competitive position on the foreign market.

#### Macroeconomic effects

The macroeconomic effects of accession to the internal market are presented in Table 4.1. It reveals that Turkey experiences a terms-of-trade gain of 5.3% without of a terms-of-trade loss in other European countries. In particular, the EU15 experience a terms-of-trade gain of 0.1% and

the CEEC10 of 0.3%. The different magnitude in the terms-of-trade effect among countries is due to different trade shares that are relevant in the context of Turkey's accession. In particular, the share of CEEC10 exports to Turkey is somewhat larger than the corresponding share for the EU. The share of Turkish exports to the EU15 and CEEC10 together is relatively large.

The macroeconomic implications of accession to the internal market are positive for Turkey. On average, GDP and consumption increase by 0.7% and 1.8%, respectively. For the EU15, the effects are negligible while the CEEC10 experiences a drop in GDP as a result of trade diversion.

These effects are the result of three mechanisms. First, changes in the relative prices imply that countries can better exploit their comparative advantages. This increases overall production efficiency and welfare. The efficiency gain induces more capital accumulation and an increase in production. Second, the terms-of-trade gain raises welfare as the consumption volume can increase *ceteris paribus*. Third, the terms-of-trade gain as such raises the price of output relative to the cost of capital. Consequently, it raises the rate of return to investment in the CEECs. This contributes to capital formation and increases production. These dynamic efficiency gains are important for the macroeconomic impact.

The effects of the accession of Turkey to the internal market are substantially smaller than found by Lejour et al. (2001) for the CEEC10. Indeed, they find an average growth in GDP in the CEECs of about 5.3% and an increase in consumption of almost 10%. The reason for the relatively small effects for Turkey is that it concerns a relatively large country that is less open to European trade than are the CEECs.

**Table 4.1**      **Macroeconomic effects of Turkey's accession to the internal market**

	GDP	consumption	terms of trade
Turkey	0.7	1.8	5.3
CEEC10	-0.1	0.2	0.3
EU15	0	0	0.1
Germany	0	0.1	0.2

Source WorldScan. Numbers are relative changes(%) to the baseline in 2025.

The increase in production in Turkey comes, however, at the expense of production in the CEEC10. This is because these countries compete with Turkey on the internal European market in the same sectors, namely Textiles and Agriculture. The macroeconomic effects for the EU countries are relatively small. It remains positive, however, as most EU countries suffer only marginally from trade diversion while they benefit from trade creation. In terms of consumption, the gains are larger because the reduction in NTBs makes imports cheaper.

### Sectoral effects

To understand the sectoral effects of the Turkish accession to the internal market, we refer to two shocks in each sector. First, an industry where an NTB is abolished faces fiercer competition on the home market as the relative price of varieties from the EU falls relative to domestic varieties. This causes a shift in consumer demand away from domestic varieties, leading to a 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 where the NTB is abolished. The lower producer price also exerts an upward effect on the export intensity.

The second shock of the removal of NTB's is that the EU lowers its tariffs. This reduces the relative consumer price of Turkish varieties in the EU, causing a higher demand for these varieties. This exerts an upward effect on the Turkish producer price which attracts resources to this sector.

Via various linkages of consumption demand, investment demand and intermediate input demand, the two channels just described can exert an impact on the entire sectoral structure of the Turkish economy. On balance, a sector is likely to expand if an NTB is abolished and if that sector exports a large share of its production towards the EU. If a sector produces primarily for the home market, however, cheaper varieties from the EU may render the impact on production in that sector negative.

In addition to the two demand effects above, the removal of NTB's also 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 cost fall. Second, via Stolper-Samuelson factor price effects, production cost might change further.

How all these forces work out in the model depends on the details of input-output structure, comparative advantages, trade intensity of sectors, etc. The model consistently links these aspects and can thus tell us how the various channels ultimately affect the output structure. The results are presented in table 4.2. It reveals that the production share of Transport Services, Other Services, Machinery, Metals and Chemicals in Turkey declines. These are sectors where accession to the internal market does not affect trade costs or are not very competitive internationally. Other sectors in Turkey gain. In particular, table 4.2 shows modest increases in Agriculture, Business Services and Construction. The main expansion in Turkey is observed in Textiles and Wearing Apparel.

The expansion of these latter sectors is because of their strong export orientation. To illustrate, Turkish exports amount to roughly 60% of total textile production in the base year. Hence, the effect of increased access to the EU market dominates the effect of cheaper EU products on the Turkish market. In agriculture, output growth is much smaller because the EU gains access to the Turkish market.

The expanding sectors in Turkey come at the expense of the position of industries in the EU<sub>15</sub> and the CEEC<sub>10</sub>. Indeed, Agriculture, Textiles and Wearing Apparel contract in the EU<sub>15</sub>

and in the CEEC10. Workers thus shift from these sectors towards other industries which show a corresponding increase, e.g. in Other manufacturing and Food Processing.

**Table 4.2 Sectoral effects (relative changes in production) of Turkish accession to the internal market**

	Turkey	CEE10	EU15
Agriculture	1.8	-0.4	-0.2
Energy	-0.1	0	0
Food processing	1.3	1.9	0
Textiles	26.7	-0.3	-0.4
Wearing apparel	28.9	-2.2	-1
Chemicals and minerals	-6.3	0.6	0.3
Other manufacturing	1.6	0.7	0
Metals	-2.7	0.3	0.1
Machinery and equipment	-3.1	0.5	0.2
Transport equipment	-8	0.8	0.3
Transport services	-0.8	0.3	0.1
Trade services	1.3	0	0
Business services	3.7	0	0
Other services	-0.3	0.2	0
Construction	2.4	0.1	0

Source: Worldscan. Numbers are relative changes(%) to the baseline in 2025.

## 4.2 Free movement of labour

We now explore the economic implications of the migration shock presented in table 3.3. Thereby, we assume that the composition of migrants between high-skilled and low-skilled workers is equal to the composition of workers in the EU. Table 4.3 shows the economic implications of the migration shock. It reveals that GDP per capita rises in Turkey due to the reduced supply of labour. The reason is that capital is not perfectly mobile across countries. Hence, the lower supply of labour increases the capital/labour ratio in these countries. This raises the marginal product of labour and thereby raises wages. For similar reasons, GDP per capita in Germany and the Rest of the EU decrease. Indeed, the lower capital/labour ratio causes a decline in the productivity of labour in these countries and thus a fall in wages. The effect remains small, however, because of the modest increase in the population size. In other EU countries, immigration has a smaller impact on per capita income because of the small number of immigrants. The effect on the relative wages is negligible in all countries because we assume that the composition of migrants is identical to that of the destination country.

The total volume of GDP drops in Turkey by about 1.5% because of the outflow of labour. In Germany it increases by 1.7%. GDP in the other EU countries rises only slightly, namely by 0.5% on average. The effects on consumption are smaller than those on GDP. This is because of changes in the terms-of-trade. In particular, lower wages in Germany and the Rest of the EU



exert a downward pressure on producer prices. The opposite holds for Turkey. This renders the terms of trade effect positive for the Turkey and negative for the EU countries, with a positive effect on consumption in Turkey and a negative effect in the EU. A second reason for the positive effect on consumption in Turkey is the negligible change in national income. Although GDP decreases national income hardly changes due to the income transfers of the migrants to Turkey. Based on historical data on remittances (Worldbank 2001), we estimate that the average income transfer per migrant is 1500 US dollar in 1997. Due to income growth we assume that this amount increases by about 50% in 2025. Given the stock of about 2.7 million migrants, the total income transfer to Turkey is 6.5 billion US dollar.

**Table 4.3 Economic effects of migration from Turkey**

	population	GDP per capita	GDP	consumption	terms of trade	national income
Turkey	-3.1	1.7	-1.5	0.3	1.1	0
EU15	0.7	-0.2	0.5	0.4	-0.1	0.5
Germany	2.4	-0.7	1.7	1.3	-0.5	1.5

Source: Worldscan

## 5 Conclusions

This paper explores the economic implications of enlargement of the EU with Turkey. We consider both the enlargement of the internal market and free movement of labour. Overall, the economic implications for Turkey are positive, although modest. For instance, compared to the analysis by Lejour et al. (2001) for the CEEC10, we find that the effects for Turkey are significantly smaller. The reason is that Turkey is less open than most of the Central and Eastern European countries, which are typically smaller and closer to the EU15 than is Turkey. Moreover, Turkey is more specialized in Agriculture and Food Processing, a sector where the EU has a strong position.

The effects reported in this study tend to be of similar magnitude of those in previous model simulations of EU enlargement with the CEECs. We also find that the accession to the internal market yields disproportionate effects on particular industries. Indeed, industrial relocation will be required to reap the gains from trade and to exploit comparative advantages of countries. Therefore, some sectors will face a serious decline. For instance, Textiles and Wearing Apparel in Turkey will expand, but at the expense of these sectors in Southern Europe and the CEEC10.

The effects in this study are surrounded by uncertainties. For instance, we ignore policies that would mitigate industrial relocation, future Common Agricultural Policy, Structural Funds,

accession to the EMU, etc. These policies are, however, difficult to foresee. We also ignore that Turkey may alternatively experience a disintegration in trade if it would not accede to the EU.

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**Appendix Regional and sectoral concordances for WorldScan in**

1	Turkey	1	Agriculture
2	CEEC10 Poland, Hungary, Czech Republic, Slovakia, Slovenia, Malta, Cyprus, Latvia, Lithuania, Estonia		Paddy rice, Wheat, Grains, Cereal Grains, Non grain crops, Vegetables, Oil seeds, Sugar cane Plant-based fibres, Crops, Bovine cattle, Animal products, Raw milk,, Wool, Forestry, Fisheries,
3	Bulgaria	2	Energy and Raw Materials
4	Romania		Oil, Gas manufacturing, distribution, Coal, Minerals refined coal and oil electricity,
5	Croatia	3	Food Processing
6	Germany		Processed rice, Meat products, Vegetable Oils, Dairy products, Sugar, Other food products, Beverages and tobacco
7	France	4	Textiles
8	United Kingdom	5	Wearing Apparel,
9	Italy	6	Chemicals and minerals
10	Netherlands		Chemicals, Rubbers and Plastics. Non metallic minerals
11	Rest Europe Spain, Portugal, Greece Sweden,Denmark,Finland,Ireland, Austria, Belgium (+lux)	7	Other Manufacturing
12	FSU Russia, Oekraine and Rest FSU		Other Manufacturing, Lumber and Wood, Paper, printing and publishing,Leather products ,
13	Middle East and North Africa Morocco, Rest of Middle East, Rest of North Africa	8	Metals
14	Rest OECD United States, Japan, Australia, New Zealand, Canada,Iceland &Norway (XEF),Switzerland	9	Machinery and Equipment
15	Rest world South African Customs Union, Rest of Southern Africa, Rest of Sub-Saharan Africa, Central America and Caribbean, Mexico, Argentina, Brazil, Chile, Uruguay, Venezuela, Colombia, Rest of South America, all Asian countries and Rest world.	10	Transport Equipment
			Other Transport Industries, Motor Vehicles and parts
		11	Trade services
		12	Transport services
			other , sea and air transport,
		13	Business services
			Insurance, Other Financial services, other business services, communication
		14	Other services
			water, recreational services, government services
		15	Construction