

EU accession and the catching up of the CEEC countries

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1 Introduction

This paper explores the consequences of the enlargement of the European Union (EU) with the Central and Eastern European Countries (CEECs). We examine the consequences of the CEECs entitlement for Structural Funds support and the impact of economic integration as such. We are interested in the question whether EU accession helps these countries to catch up to EU income levels. On average income per capita in purchasing power terms is hardly a third of that in the EU. In the 1990s this gap has not been reduced. The question is whether the accession to the EU could be a help in closing this gap.

The integration process we focus on involves the accession to the internal market, the equalization of external tariffs and free movement of labour. Although these are not all the potential effects of the eastern enlargement, they capture some of its main economic dimensions. Other effects of enlargement, e.g. those associated with the subsequent accession to EMU, changes in the Common Agricultural Policy are not explored here, in part because these effects are still subject to considerable policy uncertainty.

The CEECs are relatively poor, so they are likely to be entitled for substantial support in the Structural Funds program. We assess the impact thereof by estimating the size of the transfers the CEECs are likely to receive from the EU. We do so by developing three scenarios: one where the current rules are applied to the CEECs in the future without taking the cap on the maximum support into account; a second one where we do apply the maximum cap; and a third where the rules are seriously reformed. For the most plausible scenario we assess the impact on economic growth and the potential caveats. To our estimates the large transfer sums under the heading of this program lift economic growth in the CEECs by 0.1% to 0.2% per year.

The other economic effects are assessed by combining econometric estimates with models simulations. While the implications of a common external tariff and the free movement of labour can be analysed in a straightforward manner, the analysis of accession to the internal market requires a more subtle approach. Previous studies have analysed this shock by means of an exogenous across-the-board reduction in trade costs (see e.g. Baldwin et al, 1997; Keuschnigg and Kohler, 2000; 2002; Breuss, 2001). Our analysis deviates from this approach in two ways. First of all, we take account of the sectoral variation in trade costs since enlargement of the internal market is likely to have disproportional effects on some industries.² Second, rather than simulating a “best-guess” reduction in trade costs, we estimate gravity equations to derive the size of the shock. More specifically, for 16 different industries, we derive the potential trade between the EU and the CEECs from gravity equations. The estimates provide an indication of trade flows when CEECs 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 the CEECs accede to the EU.

²Keuschnigg et al. (2001) also differentiate the reduction in trade costs between industries on the basis of non-tariff barriers reported by the OECD.

We adopt a CGE model for the world economy, called WorldScan, to explore the implications of EU enlargement in its three dimensions. The model, calibrated on the most recent version of the GTAP database, has a number of features that make it appropriate for analysing the impact of enlargement. In particular, the model makes an explicit distinction between, on the one hand, six regions in the EU and, on the other hand, Poland, Hungary and the other accession countries. Moreover, the model distinguishes between 16 industries so that we are able to explore which industries will be most affected by EU-enlargement. Thus, combined with the gravity approach, the model does justice to the sectoral variation in the reduction in trade costs.

Our simulations suggest that EU enlargement yields large gains for the CEECs and a modest welfare improvement for the EU. This conclusion is consistent with previous model simulations of EU enlargement. For instance, Brown et al. (1997) estimate welfare gains for the CEECs between 3.8 and 7.3 per cent, and around 0.1 per cent for the EU. Baldwin et al. (1997) find a real income gain of 1.5 per cent for the CEECs and more modest effects for the EU. Breuss (2001) reports effects on real GDP between 4 and 9 per cent for the CEECs and about one tenth of that for the EU. Our findings tend to be somewhat larger than the effects reported in those previous studies. This is because of the relatively large shock associated with the accession to the internal market which, in contrast to the previous studies, is based on empirical research.

Combining the effects of the customs union, internal market, migration, and that of the Structural Funds Program consumption could increase by about 15% in the CEEC (nearly 13% of the first three elements and a higher growth rate for about 20 years due to the transfers). In terms of consumption per capita compared the EU15, the increase is about 5% points. This is a substantial increase, but a long way from equal consumption levels.

The rest of this paper is organised as follows. Section 2 discusses the current state of the accession countries in terms of catching up. Section 3 describes the Structural Funds Program. The economic effects of this program are presented in section 4. Section 5 demonstrates the shock of EU-enlargement in three dimensions: the shift towards a customs union, accession to the internal EU market and free movement of labour. Section 6 analyses the implication of these shocks for both the EU and accession countries. Finally, section 7 concludes.

2 The challenge

EU enlargement brings new challenges for the EU to reduce the income disparities between the current Member States and the CEECs. The last decade is not characterized by a convergence process. Indeed, Table 2.1 reveals that, during 1989-1999, EU GDP per capita grew by 22% while the CEECs real GDP in 1999 is no higher than in 1989. Hence, the first decade of transition is characterized by a divergence in income levels between the EU and the CEECs.

The exception is Poland where the average growth rate during the last decade is more or less equal to that of the EU.

Table 2.1 Convergence and divergence between the CEECs and the EU between 1989 – 1999

	real GDP in 1999 (1989=100)	Average growth rate 1994-1999
Poland	122.0	5.8
Romania	73.7	-1.4
Czech Republic	95.1	1.6
Hungary	99.6	3.4
Bulgaria	70.7	-1.8
Slovak Republic	103.3	5.6
Lithuania	63.5	3.2
Latvia	59.4	2.9
Slovenia	105.3	4.2
Estonia	78.5	4.3
Mean CEECs	100	3.6
EU-15	122	2.4

Source: Boeri et al. (2000), Eurostat (2001) and own calculations

Comparing the first and second columns of Table 2.1, we see that there is an enormous difference between the first five years of transition and the last five years. In particular, after a sharp fall in GDP in the early years of transition, the CEECs have in the second half of the 1990s, on average, returned to their pre-transition level of welfare. During the last five years, the average growth rate in the accession countries was 3.6% per year. Poland and Slovakia even grew by an annual rate of almost 6%. Compared to the annual growth rate of 2.4% in the EU, these figures suggest that accession countries have reached a phase of convergence towards the EU-15. This, however, does not hold for all countries. For instance, Bulgaria and Romania also experienced a decline in GDP during the last five years. Also the Czech Republic features a poor track record.

To converge to the average EU level in the coming years, the CEECs need to grow substantially faster than the EU. In particular, if the difference in growth rates would remain 1.2% annually, i.e. the average over the past five years, it would take 83 years before the accession countries have moved towards the average EU-15 level. This is long by any standard. If CEECs would aim to converge at a faster rate, for instance within a period of 20 years, this would require an annual growth rate of at least 7% per year. Hence, catching up of the CEECs requires a formidable effort.

Several factors might contribute to the convergence of accession countries to the EU average, including market integration, domestic reform, and EU policies. Regarding the first component, one may think of trade integration, inflows of FDI and the associated technology transfers, free mobility of labour, and increasing competitive forces from the EU. This paper provides a quantitative assessment of these effects in Section 6 and further. Secondly, ongoing transition may stimulate growth. For instance, a further development of government and legal

institutions in the CEECs, including the administrative capacity, may enhance trust and certainty with respect to property rights (Knack and Keefer, 1997). Moreover, the creation of a civil society with appropriate coordination mechanisms, structural reform in many sectors, and investments in human capital will contribute to economic growth. The final factor that may enhance growth in the CEECs is transfers. An assessment of the EU transfer policy is an issue to which we turn now.

3 A brief description of the current cohesion policy

The European cohesion policy has two pillars: the Cohesion Fund and the Structural Funds. The Cohesion Fund is introduced in the Maastricht Treaty as support for the least developed member states to meet the criteria to enter the EMU. More specifically, member states with a GDP per capita in purchasing power parities of less than 90% of the EU average are eligible for support from the Cohesion Fund. The 18 billion Euros that is available for the period 2000-2006 is allocated by objective criteria over the four countries eligible: Spain (62%), Greece (17%), Ireland (4%) and Portugal (17%). The expenditures (co-)financed by the Cohesion Fund are restricted to areas related to transport and environment. The distribution between those two areas was roughly half-half in the previous planning period (1993-1999).

The second pillar of the European cohesion policy, the Structural Funds, is much larger in terms of budget and more complicated in terms of institutions. Its general aim is to enhance cohesion and to reduce welfare differences among the regions of EU. More precisely, since the Berlin meeting of the European Council, the Agenda 2000 agreement spells out that the Funds are to meet three objectives: support for (1) Regions whose development is lagging behind, (2) Economic and social conversion of areas facing structural difficulties, and (3) Adaptation and modernization of policies and systems of education, training and employment. Table 3.1 shows the allocation of Funds over the objectives. Next to Objectives 1, 2 and 3, there are four types of community initiatives and two (minor) types of support which are listed merely for completeness. As is clear from Table 3.1, Objective 1 is by far the largest objective in terms of budget. Eligible Objective 1 regions are: (i) NUTS 2 regions whose per capita GDP is less than 75% of the Community average; (ii) Finnish and Swedish regions with an extremely low population density; and (iii) the most remote regions such as French overseas departments, the Canary islands, the Azores and Madeira.

Annual expenditure in 2000-2006 on European cohesion policy amounts 40 billion Euro. This is 40-41% of the total EU budget or, alternatively, 0.35% of GDP in the EU. Annual expenditure in the early 1990s was only 14 billion. This implies a tripling of the budget during the last decade, an expansion that cannot be explained by inflation and enlargement alone.

Table 3.1 Allocation of structural funds over receiving countries 2000-2006

	Obj. 1	Obj. 2	Obj. 3	Total	Per capita (3)
	Billion Euro				Euro
Belgium	625	433	737	1795	180
Denmark	0	183	365	548	141
Germany	19958	3510	4581	28049	343
Greece	20961	0	0	20961	1973
Spain	38096	2651	2140	42887	1087
France	3805	6050	4540	14395	248
Ireland (1)	3088	0	0	3088	833
Italy	22122	2522	3744	28388	497
Luxembourg	0	40	38	78	183
Netherlands	123	795	1686	2604	167
Austria	261	680	528	1469	180
Portugal	19029	0	0	19029	1927
Finland	913	489	403	1805	355
Sweden (2)	722	406	720	1848	215
United Kingdom (1)	6251	4695	4568	15514	266
EU15	135954	22454	24050	182458	490

(1) Includes the PEACE (2000-2004) program

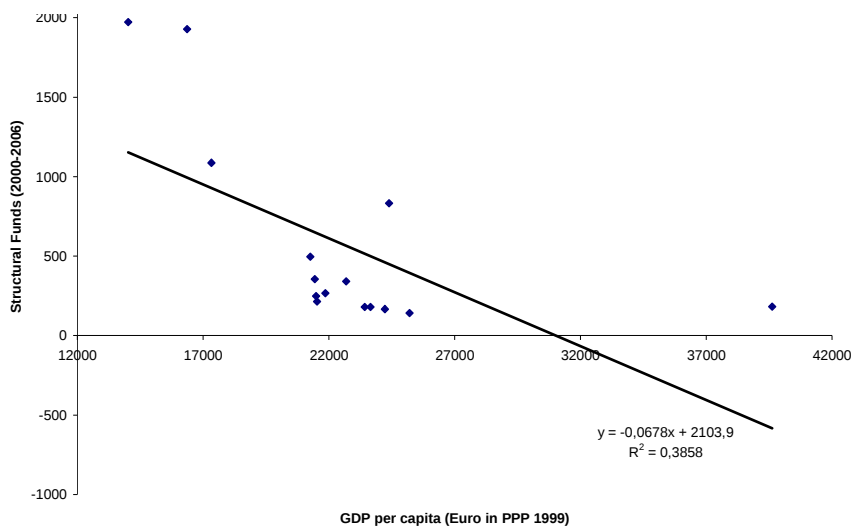
(2) Including special program for Swedish coastal areas

(3) Includes support under Financial Instruments for Fisheries Guidance

Source: http://europa.eu.int/comm/regional_policy/ag2000/finan_nl.htm

The allocation of the funds over regions eligible is fairly complicated and a detailed discussion is beyond the scope of this paper. Suffice it to note that the EU takes into account the relative wealth of a region, the relative wealth of the country where a region belongs to, population and to some extent unemployment. Table 3.1 also indicates the allocation of funds over the current 15 EU member states. It shows that there is something in every member state that makes it eligible to receive support from the Funds. Poor countries typically receive more support than rich regions. Indeed, Figure 1 shows the relation between GDP per capita in a country and the amount of support from cohesion policy. It reveals that, on average, a 1% higher income per capita yields a 3% lower amount of funds. However, even the richest countries receive some support. Regions eligible for Objective 1 support are by definition not eligible for support for other Objectives. Greece, Ireland and Portugal are (almost) fully covered by Objective 1. Hence, they do not receive funds for other Objectives.

Pre-accession support for candidate member states completes the picture on cohesion policy. An 11 billion Euro program (PHARE, 2000-2006), to strengthen institutions and implement the *acquis communautaire*, prepares accession countries for EU membership. There is a somewhat smaller program (ISPA) that resembles the Cohesion Fund.



4 The impact of structural funds on the accession countries

In order to assess the impact of structural funds on the accession countries we need to take two steps. The first is to estimate how the future allocation of structural funds looks like. The second step is to estimate the impact of the funds on output.

4.1 The allocation of funds under three scenarios

A substantial amount of structural funds is only going to be allocated to the accession countries in the next financial period that runs from 2007-2013. Until that period the allocation of EU funds is already determined. To calculate the expected allocation of funds we need to make several assumptions:

- Accession: 10 in 2004 and 2 (Romania en Bulgaria) in 2007 (to calculate EU averages we use the EU-27(-1, as we lack data for Malta).
- Economic growth: we assume 2.5% real growth for the current members and 4% for the accession countries.
- We do assume that the within-country distribution of regional income does not change.
- We do not adjust for changing PPPs in future.
- For population development we use the middle projection of the UN.
- All data are provided by Eurostat.

The first scenario is that the current rules will be applied to the accession countries too. I refer to the Objective 1 rules only. As most accession countries' regions do qualify for this Objective and the Objectives are mutually exclusive, this is a realistic approach. Table 4.1 provides the allocation of funds that would occur (the current EU members that would not receive any funds are left out in the table).³

Table 4.1 Scenario 1 and 2 Structural Funds support: the current rules apply also in the future (2007-2013)

	GDP/cap. PPS 2002-	Rel. GDP EU is 1	Effective Objective 1 Policy (Mln.)	Obj. 1 Total with 4% Cap (Mln.)	Per capita	% of GDP 2007-2013
			Scenario 1	Scenario 2		
Germany	25285	1,22	4373	4373	53	0,0
Greece	16333	0,79	7476	7476	701	0,7
Spain	19818	0,95	5162	5162	131	0,1
France	23819	1,15	1871	1871	31	0,0
Italy	23806	1,15	7086	7086	124	0,1
Portugal	18242	0,88	1123	1123	114	0,1
Total EU15			27091	27091		
			Scenario 1	Scenario 2		
Czech Republic	14750	0,71	22483	21525	2113	4,0
Estonia	9584	0,46	3633	2082	1554	4,0
Hungary	12722	0,61	18684	18684	1892	3,8
Lithuania	7351	0,35	9037	4320	1192	4,0
Latvia	7239	0,35	5579	2478	1100	4,0
Poland	9087	0,44	99333	63110	1622	4,0
Slovenia	17574	0,85	0	0	0	0,0
Slovak Republic	11996	0,58	13039	7990	1474	4,0
Cyprus	16505	0,79	0	0	0	0,0
Malta						
Bulgaria	5652	0,27	16522	5035	627	4,0
Romania	6761	0,33	53043	13801	627	4,0
Total Accession countries			241352	139026		
Total EU + Acs			268443	166118		

The first two columns provide information about income and relative income, both in PPPs. The third column shows the amount of funds allocated to the regions per country. As can be seen, the current members receive 27 billion euro in the next 7 year period (compared to 139 billion in previous period under Objective 1, see Table 3.1). The last line in the third column shows that the total budget for Objective 1, would roughly double (compare again to Table 3.1). The third column, however, ignores one important rule: the amount of support that a country

³ The regional details behind this table are available upon request from the authors. For the accession countries most regions indeed qualify for support under Objective 1 (exception are the areas including Praha and Budapest, Slovenia and Cyprus). For the current members only Greece still has a lot of regions that qualify for substantial support.

receives from the EU should not exceed 4% of their own GDP. The second scenario is the one where this rule is applied. For most accession countries this rule is binding as is revealed by the last three columns.

If this rule is going to apply to the accession countries the budget rise for Objective 1 is limited. But *if* the 4%-cap is going to apply to the accession countries the distribution of the funds is ad odds with common sense: the poorest accession countries (Bulgaria or Romania) receive lower per capita support than the relatively rich accession countries as Poland, Hungary and the Czech Republic. Moreover, wealthy countries as Italy still receive funds whereas Cyprus does not.

A third scenario is more sensible as it bases redistribution on a national criterion. One way to improve redistributive efficiency is to concentrate support to Member States with a GDP per capita below the EU average. This would however imply a serious reform of the rules.⁴ We assume that the amount of support to a country falls linearly with its income per capita. We also assume now that the discussion about the cap is going to lead to an increase in the cap to 5% of GDP. The results of this scenario are presented in the table below. For reasons of comparability we allocate the same amount of funds, as results from scenario 2. We see that in the EU-15, only Greece, Portugal and Spain would receive support. About 6/7th of the budget now flows to the new member states. Some new member states would still receive the maximum support of 5% of GDP. This cap implies still that accession countries with lower levels of GDP per capita receive less support than countries that are richer. This reduces redistributive efficiency. Alternative formulae regarding the support per Member State, or eliminating the cap on the maximum support per country altogether could alleviate this perverse distributional effect of cohesion support. This would however imply that a country like Romania would receive about 20% of GDP as a transfer; something many people would assess to be unwise.

Table 4.2 Scenario 3 Structural Funds under a national criterion (2007-2013)

	GDP/cap. PPS 2002-	Rel. GDP EU is 1	Obj. 1 Total with 5% Cap (Mln.)	Per capita	% of GDP 2007-2013
Scenario 3					
Greece	16333	0,79	8328	781	0,73
Spain	19818	0,95	6753	171	0,13
Portugal	18242	0,88	4403	447	0,45
Total EU15			19485		
Scenario 3					
Czech Republic	14750	0,71	10371	1018	1,93
Estonia	9584	0,46	2572	1920	4,94
Hungary	12722	0,61	13551	1372	2,76
Lithuania	7351	0,35	5400	1490	5,00

⁴ IBO (2001) analyses the distribution of funds under several similar systems.

Latvia	7239	0,35	3097	1375	5,00
Poland	9087	0,44	78796	2025	4,99
Slovenia	17574	0,85	1026	519	0,51
Slovak Republic	11996	0,58	8197	1512	4,10
Cyprus	16505	0,79	78	96	0,08
Malta					
Bulgaria	5652	0,27	6294	784	5,00
Romania	6761	0,33	17252	784	5,00
Total Accession countries			146633		
Total EU + Acs			166118		

To wrap up: The first scenario is not plausible as, for example, Romania would receive about 20% of GDP as a transfer. The third scenario is less plausible than the second as the rules need to be reformed fundamentally. This is unlikely as unanimity voting applies to the Structural Funds program. The second scenario requires no strong reform and the budgetary consequences are, for the EU as a whole, not severe (we ignore, however, transitional measures, that might turn out costly). Thus we take scenario 2 as starting-point for further analysis.

4.2 What do the transfers imply for economic development?

Cohesion support has the potential to encourage convergence across regions. This is clearly illustrated by various model simulations, either carried out within the EC or by outside researchers. However, Structural Funds and the Cohesion Fund are not necessarily effective in this respect. Indeed, there are several possible caveats that may reduce the growth effect of cohesion support, such as crowding out, inappropriate spending, and rentseeking. Although the EC tries to minimise these adverse unfavourable by-products of cohesion support, ex-post evaluations should say how effective it really is in stimulating economic convergence across regions. On the basis of various case studies on the impact of Structural Funds on growth, it is hard to make an objective quantitative assessment. The evidence from econometric studies is mixed: some studies report a positive, some an insignificant, and some even a negative impact of Structural Funds.

Meta-analysis reveals that the potential growth elasticity of cohesion support is 0.18. Model simulations on average suggest that an amount of cohesion support equal to one percent of GDP yields 0.18 additional percentage points in annual growth of GDP per capita. Meta-analysis also reveals, however, that the actual growth elasticity from econometric studies is a mere 0.04, almost five times smaller. The challenge is thus to reform cohesion policy such that this gap is bridged.

The current rules imply that a country can receive a maximum amount of cohesion support of 4% of its GDP. Applying an average growth elasticity of cohesion support of 0.18, we find

that cohesion policy can potentially boost the growth rate in the CEECs by an additional 0.7% per year. When taking the econometric studies as starting point the number would be somewhat more than 0.1% higher growth. The question is what is more plausible?

4.3 How effective are the funds?

There are numerous reasons why the funds are probably not so effective in reducing income disparities in the EU. The first reason – we already discussed – is that still a substantial part of the Structural funds goes to relatively wealthy countries. A second reason is that that EU funds for economic development might crowd out funds generated by domestic taxation.

A third reason for the weak (expected) performance for which there is ample anecdotal evidence is: government failures leading to inappropriate spending and rent seeking. The anecdotal evidence is complemented by Ederveen et al. (2002b) who estimate the conditional effectiveness of the Structural Funds. Hence they estimate the growth-effect of Structural Funds given the quality of the government. The latter is proxied by a corruption perception index and other measure of institutional quality. They find that structural funds contribute only positively to growth in countries with a high institutional quality. None of the accession countries, for which data are available, meet the minimum criterion.

For these three reasons we argue that an informed guess should be at the lower end of the results discussed in the previous section – between 0.1% additional growth and 0.7% – hence roughly 0.1 or 0.2%-percentage points additional growth. This implies that for all countries except Slovenia and Cyprus we guesstimate an additional growth effect of 0.1-0.2%. Over a period of about 20 years this would imply an increase in income of about 2% to 4%. The next section assesses the impact of economic integration as such.

5 Shock of enlargement

This section discusses three shocks of EU-enlargement: (i) a gradual removal of the remaining formal trade barriers in agriculture and food processing and the adoption of the common external tariff (CET), (ii) accession to the internal market, and (iii) 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 6 will analyse the economic implications of these shocks with the WorldScan model. This model is presented briefly in the last part of this section.

5.1 Towards a customs union

Accession of the CEECs to the EU implies a move from an almost free-trade area towards a customs union. This means that all remaining bilateral formal trade barriers will be abolished.

In 1997, these barriers were present in both agriculture and several manufacturing sectors. In accordance with the Europe agreements, the bilateral tariffs for manufacturing products will have been removed by 2002. The abolishment of these tariffs can thus not be directly ascribed to accession to the EU. Therefore, we do not include the Europe agreements in our analysis. Instead, we focus on the bilateral tariffs that are not covered by the Europe agreements, namely those in agriculture and food processing.

Apart from abolishing bilateral trade barriers, the move towards a customs union means that the external tariffs in the CEECs with respect to third countries will be set equal to the common external tariff (CET) of the EU. This holds for both agriculture and food processing and all manufacturing sectors.

Most regions in the EU and CEEC provide export subsidies for agricultural products and food processing. Hungary provides an export subsidy of 2.1% of the export value in agriculture and 1.7% in food processing. Compared to the CEECs, export subsidies of the EU are larger. Hence, the EU stimulates its exports of agricultural and food products more than the CEECs do. The bilateral import tariffs in agriculture and food processing in these tariffs are substantial, both in the CEECs and the EU. Compared to the EU, the import tariffs imposed by the CEECs are somewhat larger. Especially import tariffs in Poland are high while Hungarian tariffs are among the lowest.

Table 5.1 Bilateral and external tariffs in agriculture and food processing in the CEECs and the EU

	Export tariffs		Import tariffs		External import tariff	
	Agriculture	food	Agriculture	Food	Agriculture	Food
Levied by CEECs						
Hungary	-2.1	-1.7	22.7	35.6	15.9	32.0
Poland	0.0	-0.3	38.4	63.3	26.7	63.3
CEEC5	0.0	-3.5	24.6	41.0	17.6	48.9
Levied by EU-15					7.3	36.1
Hungary	-2.1	-5.2	17.3	33.2		
Poland	-3.0	-4.4	22.0	41.7		
CEEC5	-3.0	-5.4	9.4	30.4		

Source: Dimanaran and McDougall (2002)

For agricultural products, we see that the external tariff of the EU is lower than that of the accession countries. In food processing, the EU tariff is higher than in Hungary but lower than in Poland and CEEC5. Among the accession countries, Hungary imposes the lowest external tariffs. The external tariffs for manufacturing products are also relatively low for Hungary, but still higher than the CET. The Polish external tariffs are the highest in most sectors.

5.2 Accession to the internal market

The second component of EU enlargement involves the accession of the CEECs to the internal market. This will affect the economies of the CEECs and current 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.⁵ Finally, risk and uncertainty will be mitigated by the CEECs 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 the CEECs. 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 the CEECs). These risks and uncertainties may form substantial impediments to trade.⁶

In discussions about the EU internal market program of 1992, researchers had great difficulty in measuring the economic gains. The same holds true in assessing the enlargement of the internal market with new members. Today, however, we can observe how the internal market functions by comparing the trade intensity inside the EU with the trade intensity between two otherwise equivalent countries that are not part of the EU. We follow such a procedure to measure the economic consequences of accession to the internal market by estimating gravity equations on the industry level.

Gravity equations explain bilateral trade flows as a function of 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. Besides these variables we include an EU dummy that equals unity if both countries are currently members of the EU and else zero. Our main interest is in the estimated coefficient for the EU dummy. It reveals that in ten 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

⁵For a detailed discussion of these approaches and their effect on trade, see Brenton et al. (2001).

⁶Conforming to the internal market acquis may also involve costs for CEEC producers, especially environmental norms and labour market regulation (safety and health). These costs are not included in the analysis. Part of these costs, however, may be compensated by the EU through the Structural Funds. Transfers and costs may thus cancel out.

EU. The insignificant dummies may either refer to industries where the internal market has not progressed much or where technical barriers to trade are unimportant.⁷

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 the CEECs. After having determined the potential trade increase per sector, the next step is to compute a trade barrier that corresponds to this potential trade increase if it would be removed. We do this by computing a Samuelsonian iceberg trade-cost equivalents, that we refer to as non-tariff barriers (NTBs). Iceberg costs are modelled as part of the goods that melts away during the process of trade. We use the demand (or Armington) elasticities from WorldScan to infer the NTB between the EU and the accession countries that would create the potential trade increase according to our estimates. This methodology implies that, once we abolish the NTBs in the WorldScan model, we arrive at the (ex-ante) trade levels that correspond to the predictions from the gravity model. Is the potential trade increase high, then the current barrier must be high.

The weighted average NTB where sectoral output shares are used as weights is 6.7% for CEEC -EU trade and 7.0% vice versa. This is within the range of a 5% to 10% reduction in real trade cost, which was used in previous studies to simulate the impact of accession to the internal market (see e.g. Baldwin et al., 1997; Keuschnigg et al., 2000; 2002; Breuss, 2001).

Table 5.2 **Increase in total export per country on basis of EU dummy**

	total export	Export with EU15
Hungary	44	65
Poland	30	50
CEEC5	32	52
EU15	2	51 ^a

^a This figure refers to export from the EU-15 towards the CEEC7. Source: own calculations.

The potential trade increase per sector can be used also to calculate the aggregate trade increase per country. To that end, we multiply the existing trade shares of the corresponding sectors with the potential trade increases. The results are reported in table 5.2. We see that exports increase most substantially for Hungary, namely by almost 44%. Exports towards the EU even rise by 65%. For Poland and CEEC5, these figures are somewhat smaller. Total exports rise by approximately 30% and 32%, respectively, and exports to the EU by 50% and 52% of their original values. This difference is mainly because Hungarian exports are more specialized in

⁷ We refer to Lejour et al. (2001) for estimation results. Given space here, we concentrate on the macroeconomic effects.

industries with a large trade increase such as agriculture, textiles, machinery, electronic and transport equipment and other services. The aggregate increase in exports for EU countries is only 2%, which is much smaller than for the CEECs. This is because only a small fraction of total exports of EU countries is geared to the CEECs.⁸

The aggregate trade increases of table 2.2 are more or less consistent with other findings in the literature. For instance, the more recent aggregate gravity equations report an increase in bilateral trade on account of the EU dummy in the order of 30% to 60% (Brenton and Gros, 1997; Fidrmuc and Fidrmuc, 2001). Similarly, the results by Baldwin et al. (1997) suggest an aggregate increase in bilateral trade of around 30%. Studies that do not explicitly refer to the EU report even higher estimates. For instance, McCallum (1995) and Helliwell (1996) suggest that a typical Canadian province trades 22 times more with another Canadian province than with a comparable neighbouring US state. This implies that borders matter substantially. As to another illustration outside the context of the EU enlargement, Frankel and Rose (2000) find that joining a free trade area triples(!) trade and that joining a currency union triples trade once more! This would imply that our estimates provide a lower bound on the trade effects of enlargement, especially if one believes that EMU will be the next step for the CEECs after accession to the EU.

5.3 Free movement of labour

Regarding the impact of EU-enlargement on migration, we rely on a study conducted by Boeri et al. (2000). They use historical immigration figures for Germany to estimate migration as a function of wage differentials, employment differentials and a set of dummy variables. By substituting current wages, employment levels and assuming free movement of labour from the first day of accession, the authors compute the likely implications of EU-enlargement on German immigration from the CEECs. These figures are then extrapolated to the other EU-countries on the basis of historical migration patterns between the CEECs and respective EU countries.

Assuming accession in 2002 for the ten candidate member states, Boeri et al. predict an inflow of 335.000 immigrants in the first year after accession towards the EU. This flow gradually declines in subsequent years. In 2020, the stock of migrants in the current EU countries will have grown to 2.4 million, which is approximately 2.5% of the total population in the CEECs.

⁸The 2% refers to the increase inclusive of intra-EU trade. If we would use the trade data exclusive of intra-EU trade, we would arrive at a trade increase of approximately 5%.

Table 5.3 Migration by source and destination in 2020

	in 1000 persons	% of population
CEEC7	-2400	-2.6
- Hungary	-750	-2.1
- Poland	-150	-1.9
- CEEC5	-1500	-3.4
EU15	2400	0.6
- Germany	1575	2.0
- France	60	0.1
- United Kingdom	100	0.2
- Netherlands	25	0.2
- South Europe	180	0.2
- Rest EU	460	1.2

Source: Boeri et al. (2000) and own calculations.

The study by Boeri et al. also indicates the origin and destination of migrants. For instance, it suggests that 30% of all migrants originate from Poland, 7.5% from Hungary and the rest from the other accession countries. These shares depend not only on the size of countries, but also on the incentives for migration, such as wage levels and employment rates. As the income gaps of Poland and Hungary with the EU are smaller than for the CEEC5, migration shares are somewhat lower for Hungary and Poland than their population sizes might suggest at first glance. From the migrants of the CEECs, 65% will move to Germany, 2.5% to France, 4% to the UK, 1% to the Netherlands, 7.5% to Southern Europe and 20% to the rest of Europe. Of this latter group, approximately 12% of the immigrants will go to Austria.

5.4 WorldScan

WorldScan is a computable general equilibrium model for the world economy.⁹ The model is calibrated on the basis of the GTAP database, version 5 (Dimanaran and McDougall, 2002) 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, South EU (comprising Italy, Spain, Portugal and Greece) and Rest EU. The accession countries are divided into three regions: Poland, Hungary and CEEC5 (comprising Czech Republic, Slovak Republic, Slovenia, Bulgaria and Romania). For each region, we distinguish sixteen sectors. These consist of agriculture, raw materials, ten manufacturing sectors and four service sectors.

The heart of the model relies on neoclassical theories of growth and international trade. Sectoral production technologies are modelled as nested CES functions with value-added and intermediate inputs. Value added is produced by combining labour, capital and in some sectors a fixed factor in a Cobb-Douglas function. The intermediate inputs are combined in a CES function. With respect to trade, WorldScan adopts an Armington specification. In particular, commodities from different origin are imperfect substitutes, which explains two-way

⁹See CPB (1999) for more details.

trade between regions and which allows market power of each region. In the long run, trade patterns are determined by Heckscher-Ohlin mechanisms, i.e. based on factor endowments.

Enlargement of the EU with 7 countries (referred to as the CEEC7) implies an increase in the EU population by around 26%, while GDP will rise only by a mere 4%. Trade patterns of the CEECs are primarily geared to the EU (see table 5.4)

Table 5.4 Trade/GDP ratios distinguished by region in 1997

region	EU	ROW	CEEC7	Total
Export share				
Hungary	34	16	4	54
Poland	14	9	1	25
CEEC5	26	15	2	44

Source: Dimanaran and McDougall (2002).

6 Economic impact of enlargement

This section explores the economic implications of simulating the three shocks discussed in the previous section by WorldScan. We present the total effects on consumption and GDP per capita and on the terms of trade. With respect to consumption we discuss the importance of the three separate shocks. For the sectoral effects, we refer to Lejour et al. (2001).

In the experiments below, we assume that Poland and Hungary enter the EU in 2004 and the CEEC5 in 2007. All shocks are implemented gradually. The effects are evaluated in the year 2020, in which a new stable equilibrium is achieved.

The elimination of import and export tariffs and the common external tariff affects relative prices. This causes two effects. First, it affects relative prices of intermediate inputs, investment and final goods. This changes the demand for the different goods from different origins, leading to trade creation and trade diversion. Trade creation will cause a reallocation in production in all countries, resulting in efficiency improvements and an associated expansion in output. The second implication is that it affects the terms of trade, i.e. the price of exports relative to imports. Although an improvement in the terms of trade may have adverse effects on production, it can improve welfare since it raises the value of its produced goods, relative to imported goods. This welfare gain is reflected by higher consumption.

These mechanisms are also present for the accession to the internal market. The channels through which NTBs affect the economies in WorldScan are also similar to that of trade tariffs. Hence, the abolishment of NTBs changes relative prices, exerts trade creation and trade diversion, changes the terms of trade and affects the incentives to invest. There are, however, two major differences. First, in contrast to tariffs, NTBs involve income effects since they reflect real trade costs, e.g. waiting time at borders or the time devoted to customs formalities. In particular, NTBs are modelled as iceberg cost, the idea being that a share of the

commodities melts away during the phase of trade. Removing these costs will typically cause a terms-of-trade gain in both countries. To understand 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 second difference between import tariffs and the NTBs is that they are symmetric between the EU and the CEECs. 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.

The macroeconomic effects of accession are presented in Table 6.1. It reveals that the CEECs gain a lot. On average consumption per capita increases by 12.9% and GDP per capita by 10.6%. The difference is due to the positive terms of trade effect of 6.7%. The effects in the EU are very limited.

Table 6.1 Macro effects of EU accession by CEEC

	Consumption per capita				GDP per capita	Terms of trade	Population
	CU	IM	Migration	total			
CEEC7	2.3	9.3	1.3	12.9	10.6	6.7	-2.6
Hungary	2.6	13.8	1.1	17.7	12.0	8.5	-2.1
Poland	3.6	9.0	0.8	13.6	11.1	6.2	-1.9
CEEC5	0.9	8.2	1.6	10.6	5.6	6.9	-3.4
EU	0.0	0.2	-0.2	0.0	0.0	0.6	0.7
Germany	0.0	0.4	-0.7	-0.2	-0.4	1.0	2.0
France	-0.2	0.1	0.0	-0.1	-0.1	0.4	0.1
UK	0.1	0.1	-0.1	0.1	0.0	0.4	0.2
Netherlands	0.1	0.4	-0.1	0.5	0.2	0.6	0.2
South Europe	0.0	0.2	-0.1	0.2	0.0	0.7	0.2
Rest EU	0.0	0.3	-0.4	0.0	-0.1	0.5	1.2

Source: WorldScan results. All numbers on the customs union (CU) and the total effects on consumption, GDP and terms of trade are relative changes compared to the baseline in 2020. The baseline is the simulation without the three shocks. For the internal market (IM) the numbers are relative changes compared to CU. For migration the numbers are relative changes compared to IM. This implies that the numbers on consumption per capita do not necessarily add up.

For the analysis we split the change in consumption per capita in changes caused by the customs union (CU), the internal market (IM) and migration. It follows that the entrance to the internal market has the largest effects. This is not only the case for consumption but also for GDP and terms of trade. These effects are discussed in more detail below.

The macroeconomic implications of accession to the internal market (IM) are substantial for the CEECs. On average, GDP and consumption increase by 5.3% and 9.3%, respectively. The increase in GDP for Hungary is 9%, while GDP in Poland and CEEC5 increases by 5.8% and 3.4% (not shown here). For all countries, consumption growth is higher than the growth in GDP because of the substantial terms-of-trade gain. For Hungary, the extra

consumption growth due to accession to the internal market is almost 1% annually (between 2004 and 2020). For CEEC5, the increase is 0.5% per year (calculated, for comparability, between 2004 and 2020).

The terms-of-trade gain of 6.7% is also for the largest part due to the internal market. The EU experiences a much smaller gain. This different magnitude in the terms-of-trade effect is due to the large trade share of the CEECs with the EU as compared to the EU's trade share with the CEECs as shown in table 5.4.

The effects on consumption and GDP for Hungary are larger than for Poland and CEEC5. The reasons are threefold. First, the trade shock for Hungary is relatively large as Hungary has a comparative advantage in sectors that experience the largest decline in NTBs. Second, Hungary is relatively open so that a larger share of its GDP is affected by the removal of NTBs. Third, Hungary expands in sectors which are relatively capital-intensive. Accordingly, the capital stock expands substantially.

Table 6.1 shows that consumption per capita increases by 2.3% as result of the customs union. Behind this aggregate figure, there are differences among countries. Poland and CEEC5 experience a small terms-of-trade loss. This is due to the abolishment of export subsidies by the EU, and the relatively large reduction in external tariffs by Poland and CEEC5. The terms-of-trade losses imply that the change in GDP exceeds that in consumption. However, the abolishment of the large initial price distortions in Poland renders the Polish efficiency gains of trade creation also relatively large. Furthermore, the lower investment prices induce extra capital accumulation. Accordingly, the consumption and GDP effects of the customs union are relatively large in Poland.

In contrast to Poland and CEEC5, Hungary experiences a terms-of-trade gain. The reason is that both current import tariffs of Hungary vis a vis the EU and its external tariffs are lower than for Poland and CEEC5. The Hungarian external tariffs are sometimes even lower than the CET of the EU (in agriculture, and food processing) so that accession to the EU involves an actual increase in the Hungarian external tariff. The terms-of-trade improvement for Hungary, together with the positive effects of trade creation, is responsible for an increase in consumption by, respectively 2.6%. This effect is smaller than for Poland. This is partly because the initial bilateral tariffs between the EU and Hungary are lower (so that less efficiency improvements can be reaped) and because the price of investment goods in Hungary falls less than in Poland.

Our results for the economic implications of the customs union and the internal market are larger than previous studies have reported (see e.g. Baldwin et al., 1997; Brown et al., 1997; Breuss, 2001). These studies simulated a uniform 5% or 10% reduction in trade costs to explore the impact of accession to the internal market. Such a shock is no more than an eye-ball view on accession to the internal market, however. In contrast, our approach is based on the empirical findings of 16 gravity estimations. As discussed in section 2, the weighted average of our NTB's suggest a reduction in real trade costs of around 7%. The reason why we find large effects of accession to the internal market is mainly due to the dynamic effects of increased capital accumulation. Indeed, a major part of the GDP increases is due to additional investment

associated with a higher return to capital and the lower producer cost of investment goods. These dynamic efficiency gains are not always fully captured in previous studies.

We now explore the economic implications of the migration shock presented in table 5.3. Table 6.1 reveals that consumption per capita rises in the CEECs 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, consumption 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.¹⁰ The effect remains small because of the modest increase in the population size. It seems however to dominate the effects of the customs union and the internal market in Germany and the Rest EU. In other EU countries, immigration has a negligible impact on per capita consumption because the small number of immigrants.

7 Conclusions

Does the EU membership really help the CEE counties in catching up towards the EU income levels? Based on the analysis in this paper the answer is undoubtedly positive. On average, GDP increases with about 13% and consumption by 15% in these countries. These gains will mainly materialise by an efficient working of the internal market. The effects of the customs union, migration and the structural funds are more modest.

Although these effects are significant, the CEECs are far away from comparable welfare levels to the EU. In that respect, EU accession is not sufficient, but it is a major step in the catching-up process. Moreover, we have neglected the effects of FDI flows in this analysis. By the accession, FDI inflows to these countries will increase, as the period towards the accession in 2004 already learned us. The prospect of the internal market reduces the risk and uncertainty of foreign investment. These new investments will have a positive effect on production and growth. These effects can be substantial. There are not only direct effects but also indirect effects by the technology spillovers of foreign subsidiaries to the home firms.

The effects of trade and FDI seem to be more important than financial transfers from the EU to the new members. The recent past has learned that cohesion funds have a minor effect on productivity in the receiving countries. In spite of the large sums involved - often 3% to 4% of GDP for the receiving countries for a least a decade - it only raises productivity and

¹⁰Migration also increases the rate of return on capital, which creates a migration surplus. The higher rate of return to capital, however, does not raise the capital stock sufficiently to prevent a decrease in GDP per capita since capital is not perfectly mobile. For this reason, our results on the GDP effect of immigration differ from studies where capital is mobile.

economic growth by about 0.1% to 0.2% per year. Based on this paper we therefore conclude that it seems more effective that countries put their human and financial efforts in facilitating a smooth functioning of the internal markets for goods services, and capital than in trying to increase transfer sums from Brussels towards Central and Eastern Europe.

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