

# **The Role of Time in EU Enlargement**

**Fritz Breuss**  
**Research Institute for European Affairs**  
**at the University of Economics and Business Administration**  
**Vienna**

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## 1. Introduction

The Enlargement debate in the EU and in the Central and Eastern European countries (CEECs) centers on different priorities. „The earlier the better“ seems to be the maxim in the east. In the west a cautious attitude towards enlargement is prevalent. It is no wonder that the approaches differ. Integrating rich with poor countries is never an easy business as the example of NAFTA shows. The rich suspect an abandonment of their privileged position whereas the poor hope for an improvement of their unsatisfactory situation. In contrast to NAFTA, however, the EU enlargement project differs in many other respects. The CEECs carry a long communist era's legacy. They started only a decade ago to introduce democracies of western standards and to transform their economies from planned to market-oriented systems. Therefore the European Council on its Copenhagen meeting in June 1993 formulated the famous three „Copenhagen criteria“ (political standards of the EU concerning human rights and protection of minorities; a functioning market economy; acceptance of the *acquis communautaire* of the EU and the final goals of the EU, i.e. EMU and political union). An EU accession is only possible if these criteria are fulfilled. Besides the difficulty in evaluating the fulfilment of the criteria, they are a practical political instrument in delaying enlargement at any moment in time.

After the Helsinki summit of the European Council in December 1999 the priorities were clearly shifted towards integration of 10 CEECs plus Cyprus and Malta. Turkey got the status of an applicant country. The EU itself has to reform its institutions (Council, Commission, European Parliament) in order to be able to handle a larger number of members. This task should be completed in 2000 (Treaty of Nice). After the ratification procedure the Union should be ready for enlargement in 2003. At present, the EU deals with two groups of applicant countries: with the „Luxembourg group“ (Czech Republic, Estonia, Hungary, Poland, Slovenia and Cyprus) concrete negotiations have already started in October 1998; with the „Helsinki group“ (Bulgaria, Latvia, Lithuania, Rumania, Slovak Republic and Malta) negotiations have started in January 2000. Whether the negotiations end with an accession of all 10 CEECs (plus Cyprus and Malta) at once, or whether there will be a sequence of accessions with the more mature countries first and the countries adjusting only slowly to the Copenhagen criteria second is an open question. Furthermore the exact date when the first CEECs will enter the EU has not been defined yet. So the enlargement game is open.

The major purpose of this contribution is to tackle the question whether there are more gains from a rapid or a delayed EU enlargement. Or to put it differently: how can the factor time be quantified when evaluating integration effects. Second, it tries to answer the question which region will gain or lose from a speedy enlargement and in which respect. For this purpose a simple enlargement model is constructed for the two regions EU-15 and CEEC-10 (neglecting Cyprus and Malta) with the major ingredients of integration. Then simulations with this calibrated model will show which role time may play in the process of integrating the CEECs into the EU.

## **2. A simple model of EU enlargement**

There are many models around to evaluate integration effects in general and those of EU enlargement in particular (for a survey, see Breuss, 1999): single and multi-country (world) models and in each case macro models and computable general equilibrium (CGE) models. Each model has advantages and disadvantages. Neither model is able to catch all theoretically thinkable effects of regional integration, nor are the simulation models able to „correctly“ quantify the wide variety of integration effects, simply because the EU enlargement is a unique future challenge. Therefore it is no wonder that the results differ according to the method and model used. However, there is a consensus in the conclusions of all hitherto done simulation experiments: the applicant countries (CEECs) in general can expect to gain more welfare than the EU.

For our exercise a simple model is constructed which covers most of the integration effects expected in connection with EU enlargement. The model is highly aggregated and only deals with volume effects. Price effects are neglected. Likewise, it makes no difference in this model (which does not include money) whether the CEECs, when becoming full members of the EU are participating in EMU or not. The model variables are first calibrated to its starting values in the year 2000 and then used to construct a baseline scenario (without EU integration) up to the year 2020. The data mainly stem from Eurostat. The model covers trade effects, effects of factor movements (FDIs from west to east and migration from east to west) as well as the budgetary burden of enlargement for the EU and the transfer benefits for the CEECs. The model supplies results for GDP as well as welfare and indirectly it also tells to which degree a convergence of CEECs income per capita will take place during integration.

The enlargement model starts with Cobb-Douglas production functions for both regions (EU-15 and CEEC-10; see equations (1a) and (1b) in the appendix). Real GDP is explained by the inputs capital and population as well as total factor productivity (TFP) as a residual. As an additional factor exports of both regions to the respective other region enter into the production function. As externalities, the exports contribute positively to GDP. Via this channel static trade effects are translated into dynamic integration effects (spill-overs of technological progress). Population is transformed into the production factor labour by multiplication with a 40% participation rate factor. For the baseline scenario it is assumed that real GDP will grow annually by 2 percent in the EU and by 5 percent in the CEECs from 2000 to 2020. The capital stock is approximated by using a constant capital-output ratio of two. Population growth for both regions is taken from United Nations long-run population scenarios which foresee a considerable decline in both regions for the future. This calibration procedure results in a TFP for the EU-15 which is  $2\frac{1}{4}$  higher than those in the CEEC-10. Due to a natural catching-up process this relationship will shrink to 1.4 until the year 2020. Measured by real GDP the EU-15 is ten times larger than the CEEC-10, EU's population is only  $3\frac{1}{2}$  times that of CEEC-10 in the year 2000.

The capital stocks (equations (2a) and (2b) in the appendix) are generated by multiplying GDP by a constant capital-output ratio of two. They are reduced (increased) in the EU-15 (CEEK-10) by FDI flows from the EU to the CEECs by half of its size. The transfers from the EU budget to the poor CEECs are partly (by half of its value) used to build up capital (infrastructure) in the CEECs, but in turn reduce the potential of building up capital in the EU (transfers are costs for the EU member states).

FDI flows from the EU to the CEECs (equation (3) in the appendix) are growing with CEEC's GDP at a factor of 0.01. Similar to the reasoning by Baldwin-Francois-Portes (1997) it is assumed that the participation in the single market of the EU will reduce the risk to invest in the CEECs and may therefore contribute to building up the capital stock and lastly GDP. We take this risk factor into account with 0.002 of CEEC's GDP. Starting with FDI's of the EU amounting to 8 bill. Euro in 2000 a complete elimination of this risk factor would increase by 1.6 bill. Euro which is 20 percent of the initial level of FDI's.

Whereas the relatively high rental price of capital and the low wages attract capital from the west (FDI's) the huge income difference between east and west (CEEK's real GDP per capital

in PPP was only 1/3 of that in the EU-15 in the year 2000) will induce migration of population from the east to the west. This model is calibrated to the most recent estimates by DIW (2000), a study conducted on behalf of the European Commission. Total migration (equation (5) in the appendix) consists of a baseline stream of migrants without EU accession of the CEECs plus migration due to the full freedom for persons to move within the single market right from the beginning of EU accession. This will result in a migration of 1,1 million persons from the CEECs to the EU-15 in the year 2002. But with convergence of income per capita over time this additional flow of migrants (compared to a scenario without the full freedom) will diminish from an annual increase of 336.000 in 2002 down to 42.000 in the year 2020 (DIW, 2000, p. 324). In equation (4) we could also simulate a reduced flow of migration when temporary arrangements delay the complete implementation of the freedom of movement of persons with EU accession. In our simulations we do not use this opportunity. In addition migration is mitigated over time by the catching-up of CEEC's GDP per capita.

Population is driven by natural factors of birth and death and by net migration. By the latter factor population increases in the EU and hence potentially fuels GDP, whereas it reduces population in the CEEC-10 and thereby also production potentials (see equations (6a) and (6b) in the appendix).

The traditional integration effects are caught with foreign trade (trade creation and trade diversion). Here we only concentrate on trade relations between the two integration blocks. Real exports from the EU to the CEECs (equation (7) in the appendix) are explained by an income effect – relating exports to CEEC's GDP – and by a policy variable representing trade costs. We assume that trade costs amount to around 5 percent of trade in both directions. This means for EU's exports trade costs of 0.05 percent of EU's GDP. EU's real imports from the CEEC-10 are explained by the same pattern as the exports (see equation (8) in the appendix). Trade costs for the CEECs' amount to 0.4 percent of their GDP. At the beginning the EU has a trade surplus of 22 bill. Euro in real terms (see equation (9) in the appendix). The exports of the EU to the CEECs are the imports of the CEECs from the EU. The imports of the EU from the CEECs are equivalent to the exports fo the CEECs to the EU.

Finally, we consider the not unimportant – and heavily debated - feature in EU enlargement, namely the question of the costs. According to the Agenda 2000, agreed upon at a special

European Council summit in Berlin in March 1999 the gross costs of enlargement amount to 80 bill. Euro over the financial horizon 2000-2006. If one deducts around 20 bill. Euro as own resources which the applicant countries will have to pay into the EU budget (with an upper limit of 1.27 percent of GDP) as is the duty of each EU member state, then the cumulated costs of enlargement over the period 2000-2006 will amount to 60 bill. Euro. This is equivalent to 0.15 to 0.2 percent of EU-15's GDP (see Breuss, 1999, p. 8). However these cost calculations are only due for the „Luxembourg group“ of 5 CEECs and Cyprus. In our case we deal with CEEC-10. Measured by absolute GDP the „Luxembourg group“ makes up 69 percent and the „Helsinki group“ 31 percent of total CEEC-10 (excluding Cyprus and Malta). Taking into account the group of CEEC-10 one can approximate the annual costs of enlargement by around 0.3 percent of EU-15's GDP. This value is used to calibrate the costs of enlargement in percent of EU's GDP (see equation (10) in the appendix). The costs of enlargement decline over time as the CEECs will gradually catch-up with their income to those of the EU and hence will be less eligible for the full range of structural funds money. Total costs of EU enlargement are then calculated starting from the pre-accession costs for preparation of EU membership of around 3 bill. Euro per year plus the enlargement costs due to the integration the CEECs into the CAP and the regional policy of the EU (see equation (11) in the appendix).

Finally, the model shows that integration will lead to a speedier convergence of the CEEC's GDP per capita to that of the EU (see the equations (12) and (13) in the appendix).

### **3. Who gains and who loses from a rapid enlargement?**

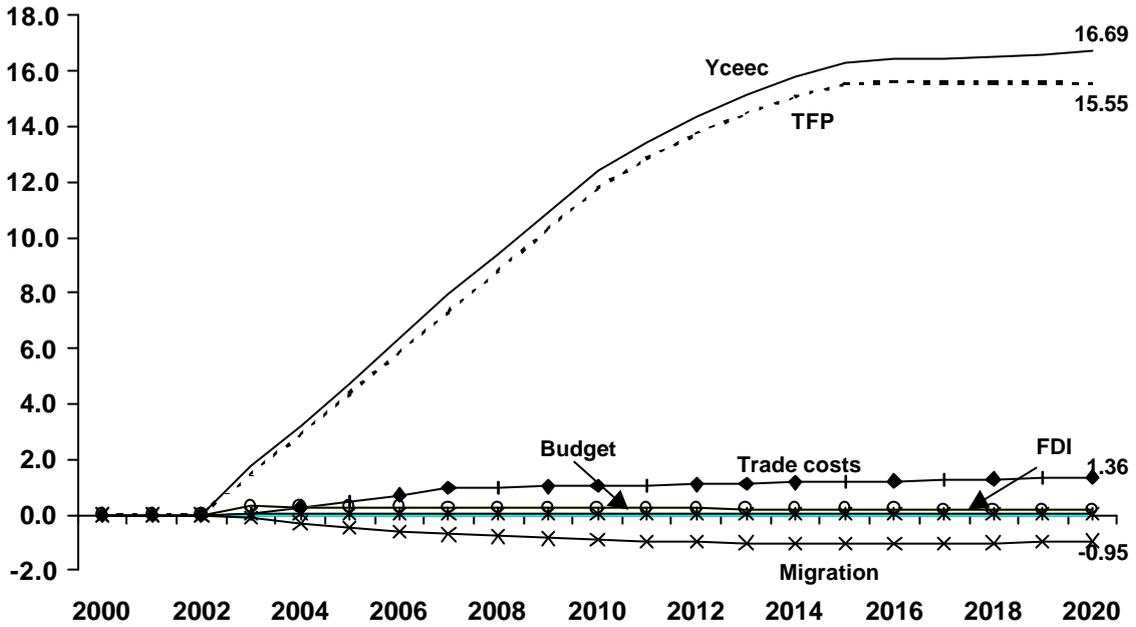
In evaluating which role time will play in the enlargement game, two different scenarios are simulated. First, it is assumed that CEEC-10 enter the EU as full members in the year 2003. Second, this region will be fully integrated into the EU only in the year 2008. In both scenarios the simulations run up to the year 2020.

In each case we can identify five integration effects:

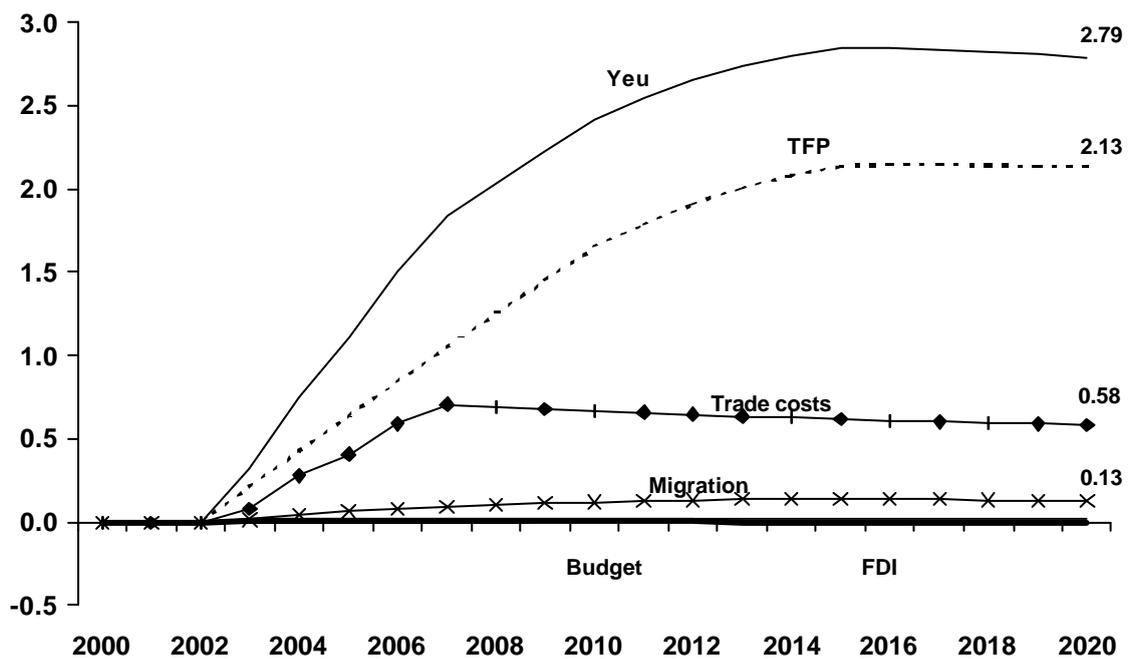
- (1) Trade creation effects through the elimination of trade costs
- (2) Direct growth effects via an increase of TFP in the CEECs
- (3) FDI effects on growth
- (4) Migration effects on population and growth
- (5) Budgetary effects (costs of enlargement for the EU and benefits for the CEECs)

This adds up to total GDP effects. In addition we can also calculate a simple welfare measure by assuming that the income effect is generated by GDP plus net-transfers out of the EU budget.

**Figure 1: EU Enlargement in 2003: GDP Effects and its components for CEEC-10**  
(Cumulative deviations from baseline in %)



**Figure 2: EU Enlargement in 2003: GDP Effects and its components for EU-15**  
(Cumulative deviations from baseline in %)



***Integration effects of an EU enlargement in 2003:***

First, we discuss the results of an EU accession of the CEEC-10 in the year 2003:

Ad (1) *Trade creation*: It is assumed that trade costs are eliminated gradually (within three years after accession). This results in a long-run GDP effect of cumulated 1.4 percent in the CEEC-10 and of 0.6 percent in EU-15 (see figures 1 and 2). The simulation runs over 18 years (from 2003 to 2020). The annual integration effects of reducing trade costs are very modest (0.08 percent in the CEECs and only 0.03 percent in EU-15). The asymmetric start in the year 2003 (the EU has a trade surplus in trade with the CEECs) leads to a continuous increase in the surplus in absolute values. However, expressed in percent of GDP it only increases up to the year 2006. Afterwards the surplus in percent of GDP declines. In the end the surplus is smaller than in the baseline scenario.

Ad (2): *Direct growth effects*: Many researchers have assumed that taking part in EU's single market will result in a push in total factor productivity in order to be able to withstand the competitive pressure of the incumbents of the EU. Taking such arguments into account we assume that TFP in the CEEC-10 will increase by roughly one percentage point per year when entering into the EU. However, this increase has been calibrated with decreasing returns over time. As can be seen from figure 1 the assumption of an exogenous increase of TFP in the CEECs is the most important single contributor to GDP growth. Over a 18 years period the GDP effects due to TFP increase amount to 15.6 percentage points (or 0.9 percentage points per year) in the CEEC-10. Via spill-over effects this single cause will result in a cumulated increase of GDP of 2.1 percentage points in the EU over the period of 18 years (or 0.12 percent per year). In their simulations in the case of the less conservative scenario Baldwin-Francois-Portes (1997) came to similar results for the long-run real income increase in the CEECs but lower income increases for the EU. However, the increase of CEECs' GDP in the long-run of similar two-digit dimensions is fueled in their model via the channel of more capital accumulation (after the elimination of risk premia for foreign investors).

Ad (3) *FDI effects on growth*: FDIs have complicated implications for growth and trade. The literature has not reached a consensus to what degree FDIs will contribute to capital accumulation in the host country (and possible reduce it in the sender country) and hence which influence FDI flows will have on GDP in the end. Similarly, it is not easy to decide whether FDIs and trade are related in a substitutive or in a complementary way. For our

purpose we assumed that there is a direct link between FDI and capital accumulation (decumulation) in the CEECs (in the EU) and hence via the production function also on GDP growth. Indirectly, higher GDP growth also attracts more imports. In our context more FDI flows from the EU to the CEECs also increase exports from the EU to the CEECs. In contrast to the extreme results by Baldwin-Francois-Portes (1997) the GDP effects of FDI flows after integration (which is modelled by eliminating the risk premia for investing in the CEECs) are very modest (see the figures 1 and 2). In the long-run FDI will increase by 4 bill. Euro. But their implications on GDP growth are only 0.02 percentage points in the CEECs and zero in the EU-15.

Ad (4) *Migration*: Politically the hottest potato in the enlargement debate is the case of migration. In particular in the border countries Germany and Austria the fear is great that their labour markets could be disturbed dramatically by an influx of foreign labour. On the other hand serious estimates come to the conclusion that immediately granting free movement of persons when entering the EU will not lead to massive migration from east to west (DIW, 2000). If one takes into account that in the long-run the population of EU-15 will decline (over the period 2003 to 2020 by around 14 million persons) than one would need an equivalent amount of immigrants in order to keep the standard of living and be able to sustain the social security system. In our simulations – taking into account the DIW estimates of migration – EU accession of the CEEC-10 result in a long-run migration stream of 17,7 million persons. According to our model specification this implies an increase of the growth potential in the EU-15 by 0.1 percentage points in the long-run and would cause a decrease of one percentage point in the CEEC-10.

Ad (5) *Budgetary effects*: The costs of enlargement are welfare improving for the CEECs and welfare reducing for the EU-15. The direct GDP effect is 0.2 percentage points in the CEECs in the long-run but negligible in the EU-15. The costs of enlargement, however, play a role when evaluating the welfare effects.

Overall, the cumulated GDP effects of an EU enlargement in the year 2003 are high in the CEEC-10 (+16.7 percentage points over 18 years, which is +0.9 percent per year) and relatively low in the EU-15 (+2.8 percentage points and +0.16 percent respectively). Measuring welfare as the total income effect (GDP plus income from net-transfers out of the EU budget) the CEECs even gain more than measured solely by GDP. However, the EU-15 -

because enlargement causes costs – will gain less in welfare than in GDP (see table 1, third and fourth column).

**Table 1: Gains and losses from an early EU Enlargement**

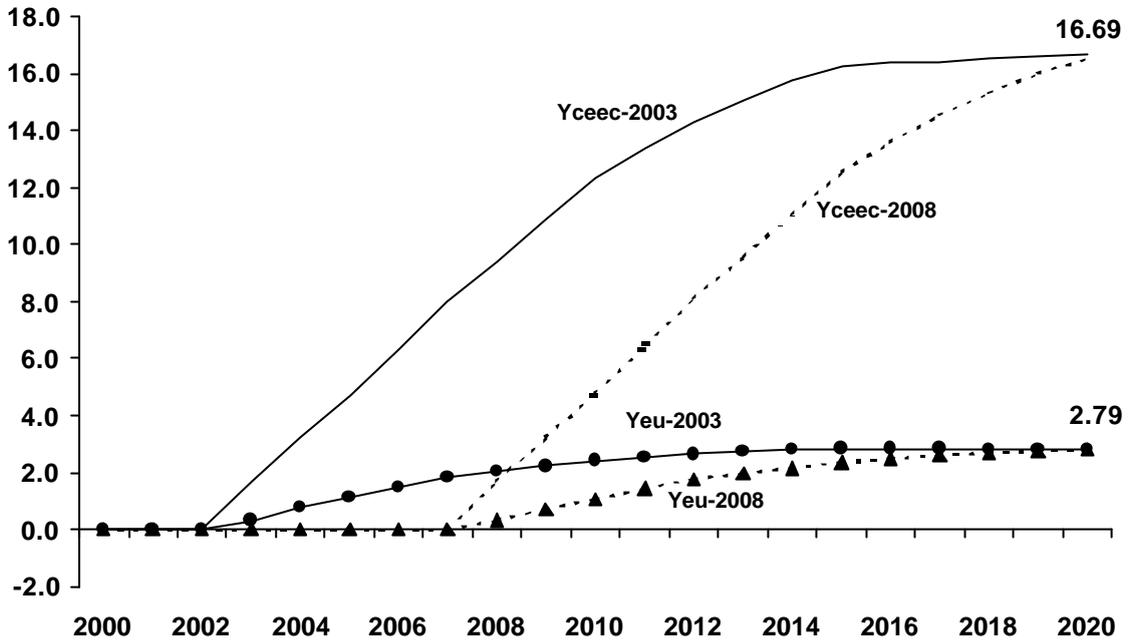
|   |           | Integration Effects of<br>EU Enlargement in 2003 |                | Additional gains/losses:<br>EU accession in 2003-2008 |                |
|---|-----------|--|----------------|---|----------------|
|   |           | <b>EU-15</b>                                     | <b>CEEC-10</b> | <b>EU-15</b>  | <b>CEEC-10</b> |
|   |           | (cumulated over 2003-2020)                       |                | (cumulated over 2003-2020)                            |                |
| Trade effects (exports - imports)                     | Bill.Euro | 355  | -355           | 115   | -115           |
| (in % of GDP)   | %         | 0.17   | -1.24          | 0.06  | -0.40          |
| TFP effects (TFP <sub>ceec</sub> /TFP <sub>eu</sub> ) | % p.a.    | -  | 0.60           | -   | 0.10           |
| FDI flows from EU-15 to CEEC-10                       | Bill.Euro | -86  | 86             | -21   | 21             |
| (in % of GDP)   | %         | 0.04   | 0.30           | 0.07  | 0.01           |
| Migration from CEEC-10 to EU-15                       | In 1.000  | 17800  | -17800         | 6200  | -6200          |
| (average per year)                                    | In 1.000  | 990  | -990           | 295   | -295           |
| (in % of population)                                  | %         | 0.28   | 1.02           | 0.08  | 0.30           |
| Budgetary costs (gains)                               | Bill.Euro | -521   | 521            | -126  | 126            |
| (in % of GDP)   | %         | -0.25  | 1.82           | -0.06   | 0.44           |
| <b>GDP effects</b>                                    | Bill.Euro | <b>4148</b>                                      | <b>3394</b>    | <b>1424</b>   | <b>1066</b>    |
| (in % of GDP)   | %         | 2.80   | 16.70          | 0.70  | 3.70           |
| Welfare effects                                       | Bill.Euro | 3627   | 3915           | 1298  | 1192           |
| (in % of GDP)   | %         | 2.50   | 18.20          | 0.63  | 4.17           |

### ***Gainers and losers from an early EU enlargement?***

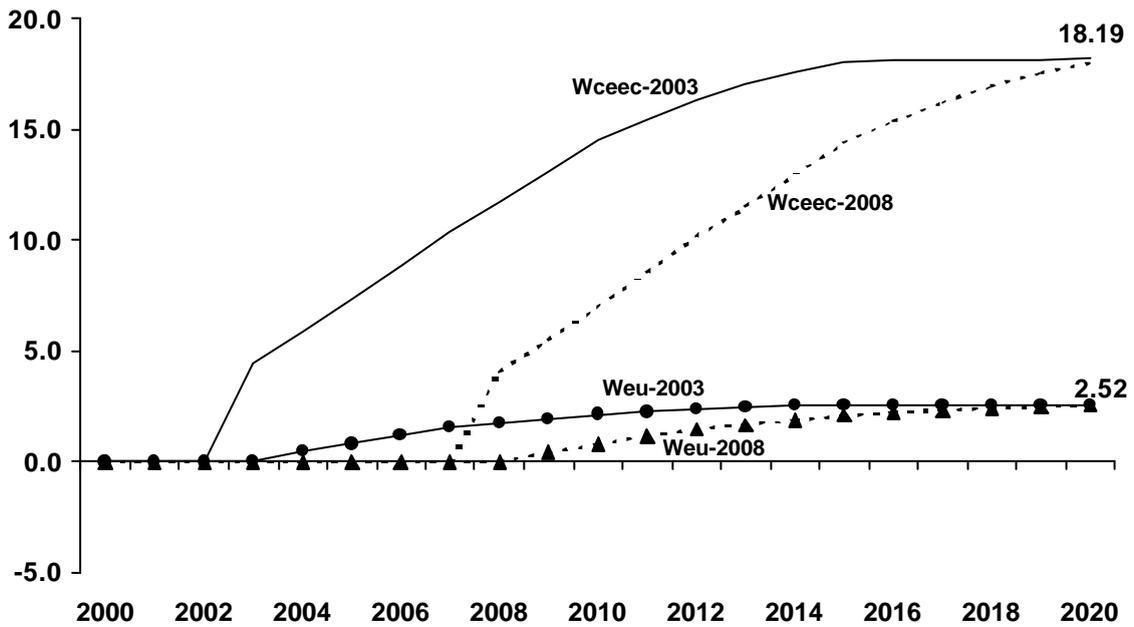
The major question is whether an early enlargement will result in higher gains than a delayed enlargement (see figures 3 and 4 and table 1).

Due to the specification of our model, in general an early enlargement results in higher GDP effects than a later enlargement. Thus, time is money! The gains are measured as the difference between the integration effects of enlarging in 2003 and those of enlarging the EU in 2008 (see table 1, fifth and sixth column). The EU gains more net-trade (115 bill. Euro). The gains of the EU are the losses of the CEECs. The earlier start in pushing TFP in the CEECs results in a lead in productivity increase. In the long-run – due to the decreasing returns assumption – relative TFP (CEEC/EU) converges in the year 2020. In the meantime, however, a lead of five percentage points is possible in the case of an earlier integration of the CEECs.

**Figure 3: EU Enlargement in 2003 or in 2008: GDP Effects for EU-15 and CEEC-10**  
(Cumulative deviations from baseline in %)



**Figure 4: EU Enlargement in 2003 or in 2008: Welfare Effects for EU-15 and CEEC-10**  
(Cumulative deviations from baseline in %)



As far as FDI flows are concerned the CEECs will get more when entering the EU earlier. This may be counted as gain for the CEECs and loss for the EU. But indirectly, also the EU would gain from more opportunities to invest in the east. An early enlargement with full freedom for the movement of persons would result in more migration from east to west by around 6 million persons over the period of 18 years. Economically, this would be a gain for the EU and a loss for the CEECs. In one respect the EU probably would favour a delayed enlargement. This is the case of the costs of enlargement. If enlargement takes place in 2008, the costs will be lower for the EU by some 126 bill. Euro over the 18 years period. Equivalently, this would result in income losses in the CEECs. Overall, both regions will gain more GDP when the enlargement would start earlier. However, due to the lower cost burden, a later enlargement would increase the welfare gains in the EU and reduce it in the CEECs.

#### **4. Conclusions**

Time plays a role in different respects in the enlargement game. An early EU enlargement would give way to build up more capital and hence GDP. It would, however, initiate the expected migration wave earlier with the consequence of loss of growth potential in the east and an improvement in the west. Seen from the costs side a later enlargement would be preferred by the EU but not by the CEECs. The former would save income, the latter would get transfers out of the EU budget only later. All in all, an early enlargement would help to bring the poor CEECs more rapidly to the EU standards. Convergence of total factor productivity and GDP per capita would be accelerated by an enlargement as soon as possible. In the long run this would help to facilitate the process of integration of the east with the west which is not easy, anyhow.

**References:**

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Breuss, F., *Costs and Benefits of EU Enlargement in Model Simulations*, Research Institute for European Affairs at the University of Economics and Business Administration Vienna, IEF Working Paper No. 33, June 1999.

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## Appendix: A Simple Model of EU Enlargement

### Production functions:

$$(1a) \quad \text{EU-15} \quad Y_{EU} = TFP_{EU} K_{EU}^a (IPOP_{EU})^b X_{EU-CEEC}^g \quad \text{with } \mathbf{a+b+g=1}$$

$$(1b) \quad \text{CEEC-10} \quad Y_{CEEC} = TFP_{CEEC} K_{EU}^a (IPOP_{CEEC})^b M_{EU-CEEC}^g \quad \text{with } \mathbf{a+b+g=1}$$

### Capital stocks:

$$(2a) \quad \text{EU-15} \quad K_{EU} = \text{Const}_{EU} + \mathbf{k}Y_{EU} - \mathbf{s}FDI_{EU-CEEC} - \mathbf{t}EUB_{EU-CEEC}$$

$$(2b) \quad \text{CEEC-10} \quad K_{CEEC} = \text{Const}_{CEEC} + \mathbf{k}Y_{CEEC} + \mathbf{s}FDI_{EU-CEEC} + \mathbf{t}EUB_{EU-CEEC}$$

### Net Foreign direct investment (FDI) flows from EU-15 to CEEC-10:

$$(3) \quad \text{EU-15/CEEC-10} \quad FDI_{EU-CEEC} = \text{Const}_{FDI} + \mathbf{m}Y_{CEEC} - \text{Risk}Y_{CEEC}$$

### Migration from CEEC-10 to EU-15:

$$(4) \quad \text{CEEC-10/EU-15} \quad MIG_{CEEC-EU} = \text{Const}_{MIG} \text{Politics} + \mathbf{r}(YB_{EU} - YB_{ceec})$$

$$(5) \quad \text{CEEC-10/EU-15} \quad MIG_{total}_{CEEC-EU} = MIG_{base} + MIG_{CEEC-EU}$$

### Population:

$$(6a) \quad \text{EU-15} \quad POP_{EU} = POP_{base-EU} + MIG_{CEEC-EU}$$

$$(6b) \quad \text{CEEC-10} \quad POP_{CEEC} = POP_{base-CEEC} - MIG_{CEEC-EU}$$

### Exports from EU-15 to CEEC-10:

$$(7) \quad \text{EU-15/CEEC-10} \quad X_{EU-CEEC} = \mathbf{h}Y_{CEEC} - TC_{CEEC}Y_{EU}$$

### Imports of EU-15 from CEEC-10:

$$(8) \quad \text{EU-15/CEEC-10} \quad M_{EU-CEEC} = \mathbf{q}Y_{EU} - TC_{EU}Y_{CEEC}$$

### Trade balance of EU-15 in trade with CEEC-10:

$$(9) \quad \text{EU-15/CEEC-10} \quad TB_{EU-CEEC} = X_{EU-CEEC} - M_{EU-CEEC}$$

### EU budget costs of Enlargement:

Costs of enlargement in % of EU-GDP:

$$(10) \quad \text{EU-15/CEEC-10} \quad T_{EU} = T_{base} - \mathbf{e}(Y_{CEEC} - Y_{base-CEEC})$$

Costs of enlargement (bill.Euro):

$$(11) \quad \text{EU-15/CEEC-10} \quad EUB_{EU-CEEC} = EUB_{base} + T_{EU}Y_{EU}$$

### Convergence of GDP per capita:

$$(12a) \quad \text{EU-15} \quad YB_{EU} = (Y_{EU} 1000000) / POP_{EU}$$

$$(12b) \quad \text{CEEC-10} \quad YB_{CEEC} = (Y_{CEEC} 1000000) / POP_{CEEC}$$

$$(13) \quad \text{CEEC-10/EU-15} \quad YB_{relat} = YB_{CEEC} / YB_{EU}$$

**Variables:**

$Y$  = real GDP (bill.Euro),  $YB$  = real GDP per capita (Euro),  $YB_{relat}$  = relative real GDP per capita (CEEC/EU),  $TFP$  = total factor productivity,  $K$  = capital stock (bill.Euro),

$POP$  = Population (in 1.000 persons),  $X$  = real exports (EU-15 to CEEC-10, bill.Euro),  $M$  = real imports (EU-15 from CEEC-10, bill.Euro),  $TB$  = trade balance of EU-15 in trade with CEEC-10 (bill.Euro),  $FDI$  = foreign direct investment flows from EU-15 to CEEC-10 (bill.Euro),  $MIG$  = additional migration from CEEC-10 to EU-15 (in 1.000 persons) after EU accession,  $T$  = costs of EU enlargement in % of EU-GDP,  $EUB$  = costs of EU enlargement (bill.Euro).

**Policy instruments:**

$TC$  = trade costs (in % GDP),  $Risk$  = risk premia for FDI in CEEC-10,  $Politics$  = migration politics (transitional arrangements for the free movement of persons),  $T$  = costs of EU enlargement (here endogenous). The suffixes  $EU(CEEC)$  stand for EU-15 and CEEC-10 respectively.

**Parameters:**

$\mathbf{a, b, g}$  = production function elasticities;  $\mathbf{l}$  = participation rate;  $\mathbf{k}$  = capital-output ratio;  $\mathbf{s}$  = capital-augmenting effect of FDI in CEECs;  $\mathbf{t}$  = capital-augmenting effect of EU budget transfers due to enlargement costs;  $\mathbf{m}$  = income elasticity of FDI with respect to CEEC's GDP;  $\mathbf{h}$  = income elasticity of EU's exports to CEEC-10 with respect to CEEC's GDP;  $\mathbf{q}$  = income elasticity of EU's imports (CEEC's exports to EU-15) from CEEC-10 with respect to EU's GDP;  $\mathbf{r}$  = effect of income difference between EU-15 and CEEC-10 on migration;

$MIG_{base}$  = baseline migration without EU accession of CEEC-10;  $\mathbf{e}$  = enlargement cost dampening effect due to an increase of CEEC's GDP;  $Const$  = constants.