

Eastern Enlargement of the EU: Factor Mobility and Transfers - Which Matters Most?

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Abstract: *This paper analyses the economic effects of the eastern enlargement of the EU both on the existing Member States and the candidate countries using simulation results of a dynamic computable general equilibrium model. In addition to conventional trade policy impacts such as custom union formation and common agricultural policy the effects of factor mobility, induced by institutional changes, are analyzed. The analysis is based on six different scenarios. According to the results EU membership will accelerate growth in output, investment and consumption in the candidate countries in all scenarios. However, it turns out that factor mobility effects dominate those of conventional trade policy. Growth in national income will lag behind GDP growth because profits will be paid out to foreign investors. Migration will slow output growth in the candidate countries and accelerate growth in the existing Member States, while the trends in per capita consumption will be reversed; migration increases per capita consumption in the new Member States and reduces it slightly in the existing ones.*

Key words: Eastern enlargement of the EU, General equilibrium modeling, Integration, Migration, Trade policy

1. Introduction

The European Union is committed to being ready to accept new members in 2002. In practice enlargement will take place later. There are currently around 10 candidate countries that can be expected to become EU members in the next 3-10 years. Sizeable differences exist between the probable new Member States. They include small, medium-sized and one large country – Poland.

In terms of their population, most of the applicant countries are small or medium-sized. The total population of the new member candidates is around a quarter of the population of the current EU. The economies of these countries are correspondingly small also. The economic and other differences between the applicant countries are significant. The income level in the most advanced applicant countries (the Czech Republic and Slovenia) is close to that of some current Member States. The weakest countries, on the other hand, are still well behind the EU level. On average, the income level of the applicant countries is around 40 per cent of that in the EU. Thus the differences in income between the current EU countries and the countries aiming for membership are larger than when Portugal and Greece acceded to the Union.

This study examines the effects of the EU's eastern enlargement on migration of labor, investments, consumption and production. These are evaluated using simulation results of a

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dynamic numerical general equilibrium model. The analysis is based on six different scenarios. The macroeconomic effects are evaluated in terms of fixed-price GDP, national income and per capita private consumption. GDP measures the change in the level of economic activity resulting from eastern enlargement. However, GDP is not a valid measure for regional income trends, if international capital movements change local ownership patterns and thereby regional capital income claims. Unlike GDP, national income describes the change in production factor incomes paid in the region. It also describes the growth in national economic potential better than GDP.

Fixed-price consumption per capita has been used in the study as a measure of the change in welfare. Changes in consumption best describe the narrowing in differences in living standards between new and existing Member States. EU membership will affect in many ways not only the GDP outlook but also changes in national income and consumption. Direct investments will accelerate growth in the capital stock in the new Member States, migration will affect both the production potential and the number of consumers and direct EU income transfers to the new Member States will affect disposable incomes and the level of investments.

The effects of eastern enlargement are analysed as cumulative deviations from the base-line growth path. A certain basic development path is assumed both for the old and new Member States. The effects of eastern enlargement are then analysed as deviations from this basic path. For the existing Member States the effects are so small that the trend of the basic path totally dominates the trend going forward. In the new Member States EU membership has a more pronounced influence.

This paper is structured as follows. Section two contains a brief overview of the model. Section three describes the reference baseline and characterizes the enlargement scenarios. Section four presents the simulation results and a final section contains concluding discussion.

2. Model used

This study assesses the economic effects of the eastern enlargement of the EU using simulations generated by a numerical equilibrium model. The model used is a dynamic extension of the comparative static GTAP model. In its production technology, the standard GTAP model (see Hertel and Tsigas, 1997) is a constant returns to scale multi-region computable general equilibrium model. The model regions are linked by bilateral trade flows. Industries are linked by input-output flows. Although product pricing is characterised by perfect competition, commodities produced in different regions are differentiated. Differentiating commodities by region makes it possible to take into account inter-industry - trade between sectors as in Armington (1969). From the point of view of dynamic analysis the central feature of the GTAP model is the modelling of saving and investment behaviour.

In the GTAP model regional investments and saving are separate decisions. Regional saving depends on the spending decisions of households and regional investments depend on investment decisions based on the expected return. Thus in equilibrium regional saving and investments can diverge in magnitude. The payments balance need not be balanced. The average return on capital varies whilst saving and investments are globally equal.

In dynamising the GTAP model three inter-temporal links were added to connect the model's individual simulation periods: (1) accumulation of fixed capital, (2) accumulation of financial claims and (3) lagged adjustment mechanisms.

In designing the accumulation of physical capital in the model, the solutions of the Australian single-area MONASH model for dynamising the numerical equilibrium model were used (Dixon and Rimmer, 2000). The model assumes that in each period capital is sector-specific. The sector-specific capital stock changes based on the investments targeted at it.

The approach of McDougall and Ianchovichina (2001) was used in designing the accumulation of capital claims. In modelling financial claims the central motivation is to make macro accounting reflect the income distribution effects of the cross-ownership of wealth caused by capital movements. If on a regional basis investments and saving can permanently diverge from each other, this will lead to changes in the areas' financial position over time. Changes in the financial position affect the definition of payments to the factors of production made abroad and received from abroad. GDP and gross national income (GNI) diverge from one another over time as the domestic and foreign financial positions change. In terms of local spending decisions and welfare, national income is a relevant variable because it describes changes in available income, unlike GDP, which describes economic activity in the region.

The model contains two types of lagged adjustments. Investment expectations may differ from the actual level of return on capital. Expectations adjust towards equilibrium by means of error-correction mechanisms. Similarly in labour markets in which unemployment is at a level at which the price trend is stable, wage demands may diverge from equilibrium wages. The movement of wages towards NAIRU equilibrium is described by means of error-correction mechanisms as set out by Solow (1990).

Accumulation of fixed capital

The model assumes the capital stock, $K_t^r(i)$, to be both sector- (i) and region- (r) specific. The model calculations assume that it takes one period for investments, $I_t^r(i)$, to turn into productive capital. Thus investments made in period t become productive capital in period $t+1$. Productive capital grows as per the equation:

$$K_{t+1}^r(i) = (1 - \delta^r(i)) \cdot K_t^r(i) + I_t^r(i) \quad (1)$$

in which the parameter $\delta^r(i)$ describes the depreciation of the capital stock. In the model investments are defined as a positive function of the expected return on capital:

$$\frac{K_{t+1}^r(i)}{K_t^r(i)} - 1 = F_{i,t}^r[EROR_t^r(i)] \quad \frac{\partial F_{i,t}^r[\]}{\partial EROR_t^r(i)} > 0 \quad (2)$$

According to equation (2), an acceleration in the rate of growth of the capital stock requires an increase in the expected rate of return on capital, $EROR_t^r(i)$. The fact that investments are an increasing function of the expected return on capital is based on the view that investors are cautious and shun risks. The investment allocation mechanism used in the MONASH model prevents unrealistically high short-term investment reactions relative to small changes in expected returns entering the model simulations.

Expected returns can be defined in two ways in the MONASH model, either as static retrospective expectations or as forward-looking expectations that are model consistent. In the case of static expectations investors only weigh the current return on capital and evaluate past performance in terms of expected returns. In the case of model consistent expectations investors use the model's calculations of future returns as the basis for investments. The advantage of static expectations is that the model can be solved recursively as a sequence of successive solutions. In the case of rational expectations the entire equilibrium path of the model has to be solved iteratively (Dixon and Rimmer, 2000, chapter 5). In the dynamisation of the GTAP model only static expectations have been used, where the expected return on capital converges in a lagged fashion via an error-correction mechanism towards equilibrium.

Accumulation of financial claims

The financial markets are not actually modelled in the dynamic model. In this respect the model is stylised and is constructed in such a way that it can be operationalised from minor data requirements. The main motivation for modelling financial claims is to reflect the dynamic consequences of the difference between domestic investments and saving in balance of payments accounting. In the model households do not own productive capital: this is owned by companies. The only savings vehicle of households is company shares, which represent an indirect claim on productive capital.

For the sake of simplicity the model assumes that companies' investments are financed from equity capital. In the model, the shares of a company in a particular region can be owned either by households in the region, i.e. domestic owners, or an international investment fund. The wealth of households in a region is invested either in domestic shares or in shares in an international investment fund. There is no inter-regional bilateral ownership in the model; only domestic ownership abroad and foreign ownership domestically. The aforementioned are the basis of the determination of payments to the factors of production made abroad and received from abroad. The return on domestic productive capital is shared between domestic and foreign owners on the basis of their ownership. The return on the international investment fund is distributed to the regions on the basis of the shares owned regionally. Vaithinen (2000, chapter 4.3) documents how cross-ownership of capital is reflected in the model's data. The pool of regional financial claims develops over time as follows:

$$WF_{t+1}^r = WF_t^{r,f} + SF_t^r + GF_t^r \quad (3)$$

where WF_{t+1}^r is the wealth invested in companies in region r in period t+1,

WF_t^r is the wealth invested in companies in region r in period t,

SF_t^r is the savings in region r allocated to domestic wealth,

GF_t^r is the investments by the international investment fund in region r.

The pool of regional financial claims grows on the basis of the domestic savings and investments in the international investment fund allocated to it. Domestic savings S_t^r are divided into investments in domestic shares SF_t^r or shares in the international investment fund SG_t^r :

$$S_t^r = SF_t^r + SG_t^r \quad (4)$$

The resources of the international investment bank, which it can diversify, between different regions are determined by the allocation of regional savings into the international investment fund:

$$\sum_r SG_t^r = \sum_r GF_t^r \quad (5)$$

The allocation of domestic savings between the foreign investment fund and shares in domestic companies is based on the principle whereby the aim is to keep the division of wealth between foreign and domestic wealth constant. Although this rule as such is ad hoc in nature, it is nonetheless in keeping with the empirical observation that savings strive to converge on domestic assets. The background to this is more fully described in McDougall and Ianchovichina (2001).

Labour market slow to adjust

In reality, the labour market does not generally adapt all that quickly to changes in the production structure, for instance. The result is often frictional or structural unemployment. The model attempts to replicate this observation by having the labour market slowly adjust to equilibrium. The model describes this adjustment as follows:

$$\Delta^2 w_t = -b \cdot (u_t - \bar{u}) \quad (6)$$

where $\Delta^2 w_t = (w_t - w_{t-1}) - (w_{t-1} - w_{t-2})$,

w_t is the logarithm of the unit wage,

u_t is the actual rate of unemployment at moment t and

$\bar{u}$ is the rate of unemployment that is appropriate at any given stable rate of inflation (NAIRU).

According to equation (6), the rate of increase in wages accelerates when the unemployment rate falls below the equilibrium rate of unemployment and slows when the unemployment rate exceeds it. Using OECD cross-sectional material, Solow (1990) has estimated the reaction parameter of wages to be 0.5. The above model is in line with a number of micro theory models describing the labour markets (cf. Layard, Nickell and Jackman, 1994).²

3. Model baseline and enlargement scenarios

To our simulation purposes the 45-region 50-commodity version of GTAP-4 database is aggregated to be more suitable for our purposes. In the commodity aggregation activities closely related to CAP and sectors likely to be influenced by enlargement, are better presented in the industry breakdown. In the modeling exercise we assume that enlargement will take place at 2005. The model baseline and data is described in next section and the simulation scenarios that characterize enlargement in section 3.2

² Kiander & Viren (1999) present empirical evidence of the times taken by the labour markets to adjust to supply shocks. In western European countries the adjustment times are typically over 5 years.

3.1. Baseline scenario of the simulation

For the model simulation the GTAP database³ was aggregated into three regions and 15 sectors. The model's areas are the present EU, central eastern Europe (CEA) and the rest of the world (ROW). Central eastern Europe is an aggregate area comprising Bulgaria, the Czech Republic, Poland, Romania, Slovakia, Slovenia and Hungary⁴. The model contains 15 aggregated sectors. The main sectors from the point of view of the EU's agricultural policy have an important ranking⁵.

In our simulation analysis the EU's eastern enlargement is assumed to take place in 2005. The model's parameters assume that prior to enlargement agriculture of present EU has been reformed in line with the AGENDA 2000 reform as adopted by the Council of Ministers in Berlin in April 1999.

From now on, the EU's eastern enlargement is evaluated such that the integration scenario is compared against the baseline scenario, which is calculated up to the year 2025, i.e. the effects of integration are assessed over a 20-year period. The simulation results are reported as deviations from the basic path. The base year of the GTAP database is 1995, when many customs duties on EU and eastern European industrial goods were still in force. Also in that year, the commitments made in the GATT Uruguay round to remove barriers to trade began to be implemented. Implementation of the AGENDA 2000 programme's reforms is also a precondition for the EU's eastern enlargement because agricultural reform will significantly reduce the costs of integration to the EU budget.

These factors have been included in the baseline path. Allowance has been made for the reduction in bilateral trade barriers under the Association Agreements, the GATT commitments and the changes to border controls required by AGENDA 2000 in the basic path for 1995-2005. The factors have been gradually built into the basic path, with bilateral customs duties on industrial products between the EU and the association partners reduced in 1995, the GATT reform implemented in stages in 1996-2001 and the reforms required by AGENDA 2000 phased in 2001-2005. The aforementioned factors have been taken into account in the basic path of the model, with trade policy shocks representing the reforms built into the trend growth path. Otherwise the economies are assumed to evolve in line with trend growth determinants.

Table 1: Regional trend growth paths and their components

Table 3 describes the factors of trend growth. In the model, growth in GDP and the capital stock are determined endogenously. Sector-specific total factor productivity and growth in the

³ The main contribution of the GTAP project to research of the international economy is its database, which describes the input and output of 45 countries or regions in 50 sectors and the bilateral trade flows between these. The database also contains information on border controls and transport costs (McDougall et. al., 1998).

⁴ The GTAP database does not describe the economy of the individual candidates, only the region consisting of the countries listed above, so that our analysis of EU enlargement relies on a partly unsatisfactory regional aggregation. Bulgaria and Romania are unlikely to be among the first countries acceding to an enlarged EU. These countries' share of the composite region's GDP is around one fifth.

⁵ The aggregated GTAP sectors are: cereals, beef, dairy, other agriculture, beef products, dairy products, other processed foods, natural resources, textiles, wood processing, chemical industry, metal products, transport equipment, other machinery and equipment, and services. The sector aggregation is the same as in the study by Vaitinen (2000), which describes how they have been aggregated from the GTAP database.

labour force are exogenous factors. Population growth is not in itself of significance for the behaviour of the model, but the welfare measures it produces are calculated in per capita terms. Aggregate productivities for the EU and the rest of the world are calculated on the basis of the data in the study by Coyle et. al. (1998) on GDP, as residuals of the income weights of the trend growth in the labour force and the capital stock. The rate of growth in the labour force is taken to be the average rate of growth for 1980-1990. For eastern Europe there is no sense in using historical reference material; the figures are calculated based on the study by Jensen et.al. (1998, s. 16), which uses medium-term growth scenarios calculated by the World Bank.

Productivity growth in the whole economy has been divided into sectoral components by interpreting sectoral productivity figures corresponding to Bernard and Jones' (1996) material on productivity in the whole economy using least-squares regression (Vaitinen, 1999). The method as such is ad hoc, but can accommodate the general feature of growth in overall productivity that agricultural and industrial productivity regularly grow faster than productivity in services (Bernard and Jones, 1996).

3.2. Simulation shocks accompanying EU eastern enlargement

The significance of EU membership for the new Member States can be divided into two types of factors. Besides traditional trade policy, EU membership means the harmonisation of economic legislation, industrial standards and norms, common competition and business support policies and the approximation of administrative standards governing business life. Trade in the single market is not hampered by the customs formalities of ordinary foreign trade, which cause trading costs on top of the customs tariffs themselves. Institutional harmonisation lowers the risk premium on investments and channels new investments into the region. For example, Baldwin et al. (1997) have emphasised this aspect in the economic development of the countries of central eastern Europe.

This study characterises the EU's eastern enlargement by means of six alternative simulation scenarios, which are set out in *box 1*. The first and second scenarios attempt to sketch out the consequences of the policy changes without any changes in the factor mobility. The first scenario analyses the effects of traditional trade policy. The second scenario also factors in income transfers from the EU's structural funds. The third scenario analyses the option under which foreign investments in the new Member States grow with the increased economic policy credibility brought by EU membership.

BOX 1 EU's enlargement simulation scenarios

Capital has traditionally been more internationally mobile than other factors of production. However, with EU enlargement it is to be expected that labour will migrate from the new low-income Member States to the area of the Member States of the present Union. Scenarios 4-6 evaluate the significance of migration for economic development given different assumptions about the propensity to labour force movements.

Scenario 1: Trade policy

From the point of view of traditional trade policy, enlargement of the EU means the establishment of a customs union between the current EU and the new Member States and the harmonisation of the instruments of trade policy. In practice this means the dismantling of mutual border controls and the installation of a similar level of border controls towards third

parties. The most significant individual element in this regard is the extension of the EU's Common Agricultural Policy to the new Member States.

With the common market barriers to mutual trade between the current EU and the new members will be removed. For the current EU, import tariffs and export subsidies will fall significantly in trade in agricultural products with eastern Europe. For eastern Europe, integration will mean moderate reductions in customs both in intraregional trade and with the EU's outlying regions. On the other hand, EU membership will significantly increase export subsidies and import duties vis-à-vis third parties. Export subsidies are funded directly from the EU's general budget. The model makes provision for this in the EU budget, which is a new element added to the GTAP model. The budget's income comprises common customs income and a GDP contribution, which keeps income and expenditure in equilibrium in the model's budget. In the model, the budget's expenditure consists solely of agricultural subsidies. Apart from changes to the actual instruments of trade policy, the simulation assumes that trade transaction costs for the EU's new and old Member States will drop by 10%. This is a standard estimate of the reduction in transaction costs in literature on the formation of the single market (e.g. Harrison and Rutherford, 1996).

Scenario 2: Structural funds

The EU has largely attempted to use the structural funds to balance out regional development within countries, but another aim of the structural funds has been to promote social cohesion. Often this has meant that Community funding has been used to solve the problems of regions suffering from high unemployment. Low GDP relative to the EU average has been the main factor in the allocation of structural funds expenditure. Regions whose GDP has been below 75 per cent of the EU average have received the bulk of funding from the structural funds. Of individual countries, the majority of structural funds expenditure has been directed at the four current Member States Greece, Ireland, Portugal and Spain. The new Member States are all poor in the sense that most of their regions are entitled to structural subsidies. At the same time, the entry of the new Member States will lower the EU's average GDP so that many of the current recipient regions will lose the structural support they enjoy at present.

Structural subsidies have been factored into this study very much in a simple, straight-line way, being modelled simply as regional investment subsidies in central and eastern Europe. The magnitude of the subsidies is taken directly from the five-year estimate of the EU's budget guidelines (Official Journal of the European Communities, C172/1, 1999). In this estimate, the provision for structural funds expenditure on the new Member States in the period 2002-2006 is that in the first year expenditure is 3750 million euros, rising to 12 billion euros by 2006. In the estimate 2002 is the first possible year of membership for the six new Member States. In the study's scenario, the start of the planned budget expenditure is deferred until 2005. The increased expenditure has been covered by corresponding deductions from the current Member States.

The way in which the subsidies have been accounted for here is very rough. Investment subsidies, for example, have not been targeted by sector. Nor does the model distinguish between public and private investments, i.e. it is not possible to analyse the possible ways in which public investments crowd-out private investments. In the model, the structural funds are simply public support for the purchase of commodities, which promotes the accumulation of capital and economic growth. The model's calculations totally lack dynamic efficiency analyses, for example from the point of view of optimal saving. As regards any appraisal of

the impact of the structural funds, therefore, the results should be seen as being indicative only.

Scenario 3: Capital movements

European Union membership will integrate the new members more closely than free trade and the customs union into the Common Market institutions and the legislation governing business life within the Community framework as a whole. EU legislation forms a harmonised operating environment – familiar especially to EU investors – and also removes the possibility of individual countries making unforeseen trade or industrial policy changes. Membership also accords companies in the new Member States full access to the Common Market. For reasons of various rules of origin, amongst others, this is not the case with free trade or the customs union.

In this study the effect of the boost to credibility brought about by institutional factors is estimated in the form of a reduced capital return requirement. The magnitude of the effect is taken from the estimate by Baldwin et al. (1997), according to which the increased credibility would reduce the required return on capital by 15 per cent. Even allowing for this, the required return on capital remains permanently above the EU average in the model. In other words capital return rates do not need to converge in the model's calculations even in the long term, so in that sense the estimate used can be considered conservative.

Scenarios 4-6: Labour force mobility

It is believed that the freedom of movement of the labour force made possible by the EU's eastern enlargement will increase migration from the new Member States to the area of the current EU⁶. A number of studies have attempted to estimate the scale of this migration, and the findings of these are summarised in a Commission (2001) report. In assessing the labour market effects of this migration, the research findings typically range from 70-150,000 workers per annum. Higher estimates of the numbers of migrants have also been put forward, but these include dependants brought by workers and migration for other reasons. These estimates put total migration at 120-380,000 immigrants. According to the Commission's (2001) report, total annual immigration to the EU area in recent years has been around 800,000 and there have been around 300,000 asylum-seekers. Compared to this population flow, the immigration caused by EU enlargement cannot be considered dramatic.

The population of the current EU is around 384 million and the labour force 176 million. The total population of the candidate countries is around 104 million and the labour force 53 million. There are currently around 12 million foreigners living in the EU, with around 5.3 million foreign employees in the workforce (EUROSTAT, 2000). Of this population, around 800,000 persons are from the present candidate countries. Of these, around 300,000 are legally employed in the EU area.

Figure 1: Changes in employment at current member countries in alternative migration scenarios

Figure 1 presents three different scenarios of the effect of labour force mobility on the supply of labour in the current EU area. Of these, scenarios 1 and 2 are very close to the estimate of

⁶ For movement of labour, see Faini (1995), Borjas (1999), Boeri and Brücker's (2000), and Bauer and Zimmermann (1999).

Boeri and Brücker (2000) of labour force mobility⁷. In the calculations in scenario 1 in the aforementioned sources the estimate is based on a calculation in which Romania and Bulgaria are not members, whereas they figure in the estimates in scenario 2. In the third scenario the propensity to migration is doubled.

In the model used in the study, migration is explained by income differences. The propensity to labour force mobility is calibrated so that it is close to Boeri and Brücker's (2000) estimate of migration. The estimates of changes in the cumulative pool diverge because in the model in this study income differences decline somewhat slower than in the estimates used by Boeri and Brücker (2000). However, they are of a similar order of magnitude.

In scenario 1, cumulative migration increases labour supply in the EU over a ten-year period by 0.35%, in scenario 2 by 0.75% and in scenario 3 by 1.4%. The corresponding figures after 15 years are 0.5%, 1.0% and 2%, and after 20 years 0.65%, 1.3% and 2.5%. The calculations assume that each employee is accompanied by one dependant. Since the share of the labour force of the total population of the EU is around half, the impact of migration on the population is relatively speaking the same as that on the labour force.

The relative impact of migration into the EU area on the labour supply or the population total remains comparatively small even if migration is assumed to be fairly substantial. But for eastern Europe the impact of migration is significantly higher. In scenario 1, cumulative migration over 10 years reduces the labour supply and the population in eastern Europe by 1.3%, in scenario 2 by 2.7% and in scenario 3 by 5.2%. The corresponding figures over 15 years are 1.9%, 3.8% and 7.3%, and over 20 years 2.4%, 4.8% and 9.2%. Relatively speaking the figures are four times the effect on the current Member States. For comparison, in the 10-year period since the border was opened, 7.3% of the population of the former East Germany has moved to the western parts of the country (Commission, 2001). Of these migrants, one third – 2.8% of the total population – moved to the west in the first six months, i.e. before German unification.

4. Results of the model simulations evaluating EU eastern enlargement

In this section the macroeconomic effects of the six model scenarios estimating the EU's eastern enlargement are presented. The macro economic effects are assessed in terms of fixed-price GDP, national income and per capita private consumption. GDP measures the change in the level of economic activity following eastern enlargement. However, this is not a valid measure for the regional incomes trend if international capital movements alter regional ownership and thus requirements for regional capital income. The change in national income describes the change in incomes of the factors of production paid in the area. It describes national potential economic growth better than GDP. Fixed-price per capita consumption has been used here to measure the change in welfare because measures of welfare commonly used in comparative and static models such as equivalent variation cannot be computed directly in models that develop over time (see Ianchovichina and McDougall, 2001).

⁷ Boeri and Brücker's (2000) study bases its estimate of migration on a model in which the main factor explaining migration is income differences adjusted for purchasing power. The material for the model is migration to Germany from countries from which there has been 'free' movement of the labour force.

The effects of the EU's eastern enlargement are analysed as cumulative deviations from the basic growth path, which was described in section 3.1. In the model's calculations eastern enlargement is assumed to take place as of the beginning of 2005. The economic effects of enlargement are simulated for 20 years from that date. The effects are analysed for six scenarios (sim1-sim6). The shocks characterising the scenarios are described in *box 1*.

4.1. Impacts of enlargement on Eastern Europe

Impact of trade policy and structural funds on eastern Europe

Figure 2 presents the simulated GDP effects of eastern enlargement on the eastern European region. The cumulative effects of scenarios 1-3 are rendered as stacked bars. The results of the scenarios estimating labour force mobility are represented by lines. Scenario 1 is an estimate of the effects of traditional trade policy. The impact of this on GDP growth is remarkably small. The cumulative effect is around half of one per cent of GDP. The effect is somewhat greater in the first years of membership. The effect on GDP is the result of the more efficient use of resources. The effect on private consumption is bigger, however. This is because with the EU's Common Agricultural Policy the costs of agricultural policy are paid from the Community budget, and the resulting incomes are greater than the candidate countries' contributions to common expenditure. Another important aspect in this respect is the improvement in the terms of trade of the eastern Europe region as a result of trade liberalisation. This increases disposable incomes but not fixed-price GDP.

Figure 2: Deviation of GDP from baseline in CEA's

Scenario 2, which takes account of structural fund transfers, increases GDP only slightly at first, but more so over time. This is partly because of the assumed growth profile of structural fund income transfers, but partly because the cumulation of investments leads to increased production capital capacity. This increases disposable incomes in that when some of the increased additional incomes are saved and invested, this has multiplier effects in promoting economic growth. This can also be seen in figure 3, which compares the changes in GDP (GDP 2) and national income (GNI 2) in scenario 2. Initially, structural fund income transfers increase disposable incomes more than GDP, but the cumulation of investments means that GDP growth accelerates more than the growth in incomes.

It can be seen from figure 2 that the immediate effect of EU enlargement is that economic growth accelerates in the new Member States such that the cumulative divergence from trend is initially around 2 per cent compared to the basic path. This is largely due to the increased income transfers accruing to the new Member States. The simulations assume that at the time of enlargement unemployment in the candidate countries is at an appropriate level for stable inflation, i.e. it is at the NAIRU level. Growing income transfers increase overall demand and accelerate the rate of price increases. This increases unemployment, which dampens wage demands, so that the price trend over time stabilises on a path that is in keeping with stable growth. The growth in production immediately following integration slows for a period to below trend. After an adjustment phase, however, growth picks up again and in the model's calculations it is above previous trend growth for the entire period of the analysis.

The slowing in the initial growth stimulus should not be interpreted as a 'prediction' of the future trend in this regard, because at the time in question the countries' economic

development will be affected by factors other than those in the analysis. Also, the growth profile in figure 2 is dependent on the assumptions made in the model, for example that at the outset unemployment is in equilibrium and that integration does not affect the level of equilibrium unemployment. It is to be expected, however, that after the initial growth impulse increasing income transfers will lead to a temporary acceleration in price rises and slowing growth.

Figure 3: GDP and GNI - deviations from baseline in CEA's

Impact of foreign investments on eastern Europe

Scenarios 1 and 2 analyse the effects of EU income transfers on the changed operating environment in the new Member States. Scenario 3 attempts to assess the significance of the possibly increased mobility of the factors of production as far as capital movements are concerned. Increased investor confidence will potentially be of major significance for growth in overall production in the region. In the simulated model analysis in this study the cumulative GDP divergence is twice as great at the end of the analysis period as the effects of the policy shocks purely induced by membership. In scenario 3, the cumulative GDP trend divergence is 15% above the basic scenario at the end of the period, whilst in the calculation reflecting the joint effect of scenarios 1 and 2 it is around 7% higher than the basic scenario.

The growth in foreign investments is seen in the form of strong growth in overall production, but the effect on the incomes of the factors of production in the region is very slight. This can be seen in the comparison between GDP (GDP 3) and GNI in figure 3. Disposable incomes grow only fractionally more than in scenario 2, where no assumption is made regarding the reduced anticipated rate of return on capital. At the end of the analysis period, per capita private consumption is around one per cent higher than in the scenarios that do not take account of the growth in capital movements.

As regards scenario 3, it should be noted that in the GTAP model capital income taxes are not included for any of the regions in the model. If for example a 20% effective capital income tax in eastern Europe were to be a 'competitive' rate of tax that would not alter investor behaviour, disposable incomes in the region would grow by around two per cent compared to the basic path.

Figure 4: Consumption per capita - Deviations from baseline in CEA's

Impact of labour force mobility on eastern Europe

Labour force mobility from the new Member States to the area of the current EU decreases economic growth as measured by GDP in the new Member States. At the end of the analysis period cumulative GDP in the low-migration scenario is around two per cent lower than in scenario 3. The corresponding variations for scenarios 5 and 6 are four and seven per cent. In the maximum migration case the GDP-depressing effect of the outflow of labour is approximately equivalent to the boost received to GDP from increasing investments.

However, the outflow of labour raises the wage level and per capita incomes, which is seen in the form of significant growth in private consumption in all the migration scenarios vis-à-vis a situation with no labour outflow. In the maximum migration scenario, per capita private consumption grows almost twice as much vis-à-vis a situation with no labour outflow.

4.2. Effect of eastern enlargement on the EU's current Member States

The economic effects of the EU's eastern enlargement are an order of magnitude smaller on the current Member States. Figure 5 shows that initially the GDP effects of scenarios 1-3 are almost non-existent and even at the end of the analysis period are only around 0.25 compared to the basic growth path. In all the scenarios labour force mobility turns GDP growth positive. In the case of maximum migration overall production is 1.5 per cent above the trend growth path.

In comparing national product and national income it is noticeable that in scenario 2 national income initially declines more than GDP. This is because the current EU countries are the net payers of the income transfers received by the new Member States. In terms of national income, however, the costs are only around 0.2 per cent compared to incomes in the basic growth path. This ratio remains reasonably stable throughout the analysis period. Taking into account the possible growth in capital movements, the GDP effects are greater than the national income effects. This is because some of the investments directed at the current EU area are targeted at the new Member States. Increasing capital incomes from these countries compensate effects resulting from slowing GDP growth. As a result of the growth in capital incomes, the costs of enlargement in the calculations presented here are in fact somewhat smaller than without growing capital movements.

Migration has a distinct effect on changes in per capita consumption. In the lowest migration scenario per capita consumption falls around twice as much as without migration. However, the decline is only 0.3 per cent compared to the basic growth path. In the maximum migration scenario the change in consumption is just short of one per cent, whilst the growth in population is 2.5 per cent.

Figure 5: Deviation of GDP from baseline in the current EU

Figure 6: GDP and GNI - deviations from baseline in the current EU

Figure 7: Consumption per capita - Deviations from baseline in the current EU

5. Discussion of the results

EU enlargement will have a significant impact on economic development in the new Member States. The countries of central and eastern Europe will gain substantially from EU membership. For the EU's current Member States, on the other hand, the economic effects of enlargement – both the benefits and the costs – will be small. This difference results naturally from the difference in size between the current and the new Member States. The total population of the new Member States is only around a quarter of the population of the current EU, and their economies are very small compared to the economy of the old Member States.

The actual effects of the EU's eastern enlargement will depend on when and in what order enlargement takes place and what transition periods are applied. The present study assumes that the new Member States will gain immediate access to the EU's Common Agricultural Policy and structural policy. If this happens, the principal effects of eastern enlargement will be the liberalisation of trade - extending also to agriculture, large agricultural and structural policy income transfers to the new Member States, growth in direct investments directed at

the new Member States, and migration from new to old Member States as a result of the free movement of labour.

The effect of enlargement on private consumption in the new Member States is greater than the change in the rate of growth in GDP. This is because the calculations assume that with the EU's agricultural policy the costs of agricultural policy will also be paid to the new Member States from the Community budget. The resulting income to the candidate countries is greater than their contributions to common expenditure. In other words the new Member States become net beneficiaries and the old Member States on average net payers. This change increases disposable incomes in the new Member States. Another aspect that is important in this connection is the improvement in eastern Europe's terms of trade as a result of the liberalisation of trade. This increases disposable incomes but not fixed-price GDP.

It turns out that that conventional trade policy effects of enlargement - formation of custom union and implementation of common agricultural policies to new member states - are of minor importance compared to the effects of factor mobility. Factor mobility is induced by institutional changes that on the one hand boosts business confidence and on the other hand removes obstacles to labour mobility.

The calculation that takes account of structural fund income transfers to the new Member States increases GDP only slightly at first, but increasingly so over time. This is partly because of the assumed growth profile in structural fund income transfers, but partly because the cumulative effect of investments increases the capacity of productive capital. This is because the model calculations assume that structural subsidies increase the investment rate in the new Member States. Initially, structural fund income transfers increase disposable incomes more than GDP, but the cumulation of investments means that GDP growth accelerates more than the growth in incomes.

Increased investor confidence as a result of EU membership is of major significance for growth in overall production in the new Member States. The growth in foreign investments is seen in the form of strong growth in overall production, but the effect on the incomes of the factors of production in the region is substantially smaller. This is because part of the profits are ploughed back to the foreign investors.

The free movement of labour is the issue that has raised the most discussion and concern in the EU's eastern enlargement. Big differences in wages and incomes will encourage people to move, and the gap in living standards between eastern Europe and the current EU countries is large. Measured by exchange rates, the income differences between Poland, for instance, and the current EU countries are significant – around eightfold. However, income differences adjusted for purchasing power are considerably smaller, which will also reduce the willingness to move.

EU membership for transition economies entails integration and convergence. It is thought that EU membership will boost economic development in the new Member States so that eventually they will close the gap in production and productivity with the existing Member States. If convergence takes place (as it has already taken place in Poland and Hungary for five years), the income level in the new Member States will gradually approach that in the current Member States. The progressively narrowing income difference between countries will also gradually reduce migration pressures.

The model's calculations quantify the economic effects of different scales of migration. The migration of labour from the new Member States to the current EU area reduces economic growth as measured by GDP in the new Member States. A contracting labour force reduces their growth potential. However, the effect of migration is not only negative. The outflow of labour increases the salary level and per capita incomes in the new Member States, which is seen in the form of significant growth in private consumption under all the migration scenarios compared to a situation with no migration.

The economic effects of the eastern enlargement of the EU on the existing Member States will be smaller by an order of magnitude. A comparison of the trends in national product and national income shows that initially national income declines more than GDP as compared to the basic trend path. This is because the current EU countries are net payers of the income transfers received by the new Member States. In terms of national income, however, the costs are very small - only around 0.2 per cent compared to incomes in the basic growth path.

Following enlargement, the increasing capital incomes from the new Member States produced by direct investments will compensate for the effects arising from the slowing in GDP growth. As a result of the growth in capital incomes, the calculations presented in this study actually show the costs of enlargement to be somewhat smaller than they would be without increasing capital movements.

In the current Member States, too, inward migration will affect changes in per capita consumption. Even in the lowest migration scenario, per capita consumption declines around twice as much as without migration. However, the decline is only 0.3 per cent compared to the basic growth path. In the maximum migration scenario the change in consumption is just short of one per cent, whilst the growth in population and GDP is 2.5 per cent.

Theoretical analyses of labour force mobility show that improved migration opportunities generally improve total incomes in the target country. However, the benefits of immigration are not distributed equally, and the incomes and welfare of certain groups can even deteriorate. The distribution of benefits depends on the configuration of skills of the newcomers compared to the configuration of skills of the original population. But the configuration of newcomers' skills is not coincidental, but rather depends on the economic incentives both in the country of departure and the target country and in particular on the distribution of incomes and salaries. Although EU enlargement may cause welfare losses to certain groups in the current Member States, the overall benefit of enlargement is sufficient to make up for these losses.

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Table 1: Regional trend growth paths and their components

Percentage changes in growth				
	GDP	Capital stock	Labour force	Population
European Union	2.4	2.7	0.5	0.2
Central and eastern Europe	3.2	3.5	0.2	-0.2
Rest of the world	2.6	2.8	0.6	1.7
Sector-specific total factor productivity				
	Overall productivity growth %	Agriculture	Industry	Services
European Union	1.0	2.4	1.8	0.8
Central and eastern Europe	1.8	3.6	2.3	1.2
Rest of the world	1.0	2.5	1.7	0.7

BOX 1: EU's enlargement simulation scenarios*Scenario 1*

Changes in trade policy

- Formation of customs union between the EU and its new members and removal of remaining barriers to trade,
- 10% reduction in bilateral trade transaction costs,
- Extension of Common Agricultural Policy and related subsidy mechanisms to the new Member States.

Scenario 2

Trade policy and structural funds

- Structural Fund expenditure measured as defined in the appropriations in the EU's budget framework for Community enlargement. In the simulations, the appropriations are deferred until 2005, being initially 3750 million euros and rising to 12,080 million euros over a five-year period.

Scenario 3

Trade policy, structural funds and growth in investments into eastern Europe

- and in addition to (2) it is assumed that with the institutional credibility brought by EU membership the expected capital yield requirement in eastern Europe will fall 15 per cent from the pre-membership level.

Scenario 4

Same as scenario (3) but including a moderate estimate of labour force mobility (employment 1).

- Mobility declines in stages; initially 70,000 persons annually and later 60,000. Effect on the work force over 10 years around 0.7 million and over 20 years around 1.3 million.

Scenario 5

Same as scenario (3) but including 'consensus estimate' of labour force mobility (employment 2).

- Mobility initially 140,000 persons annually and later 115,000 persons. Effect on the work force over 10 years around 1.4 million and over 20 years around 2.6 million.

Scenario 6

Same as scenario (3) but labour force mobility assumed to be double to the 'consensus estimate' (employment 3).

- Mobility initially 280,000 persons annually and later 215,000. Effect on the work force over 10 years around 2.7 million and over 20 years around 5 million

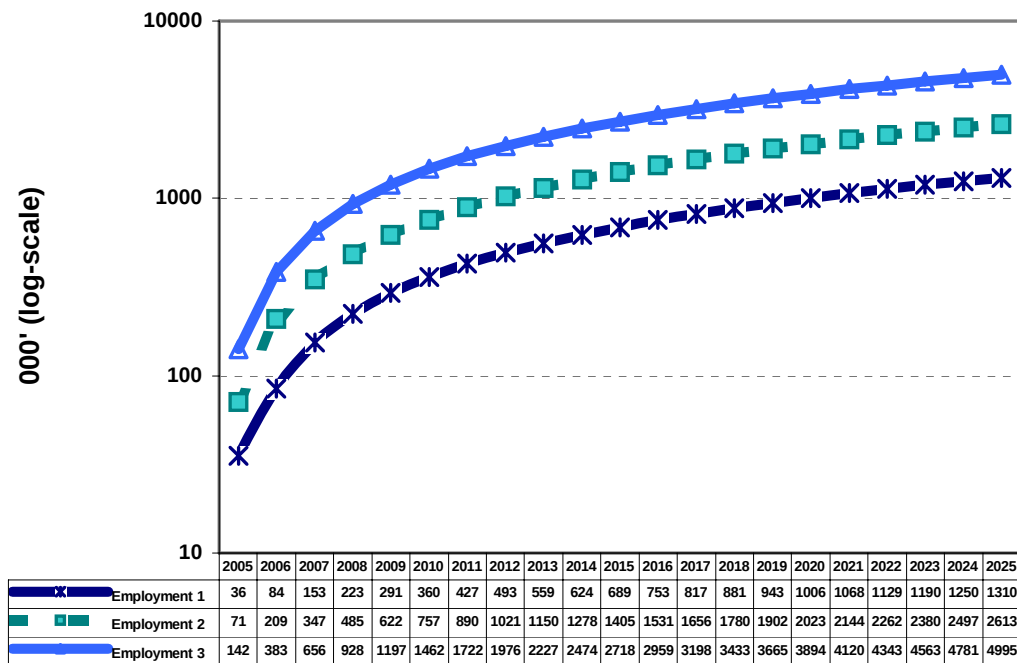


Figure 1: Changes in employment at current member countries in alternative migration scenarios

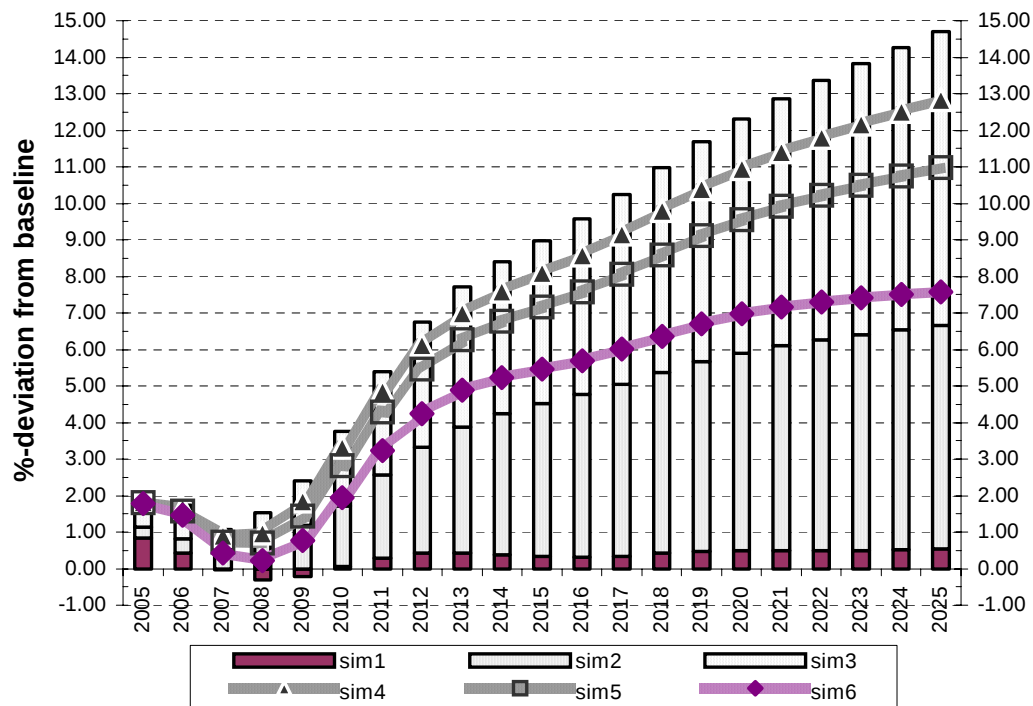


Figure 2: Deviation of GDP from baseline in CEA's

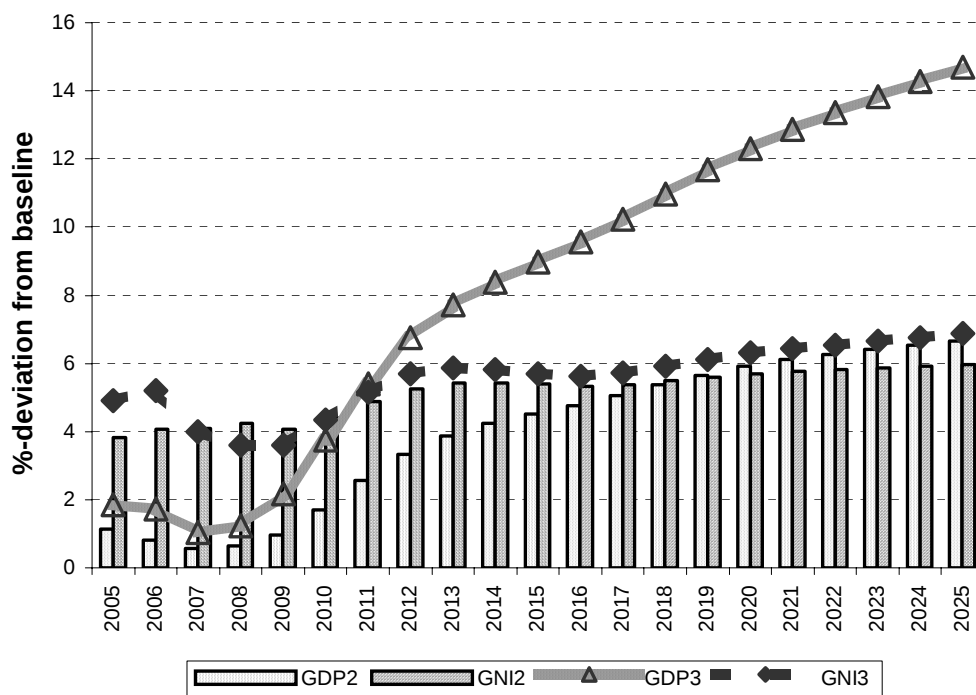


Figure 3: GDP and GNI - deviations from baseline in CEA's

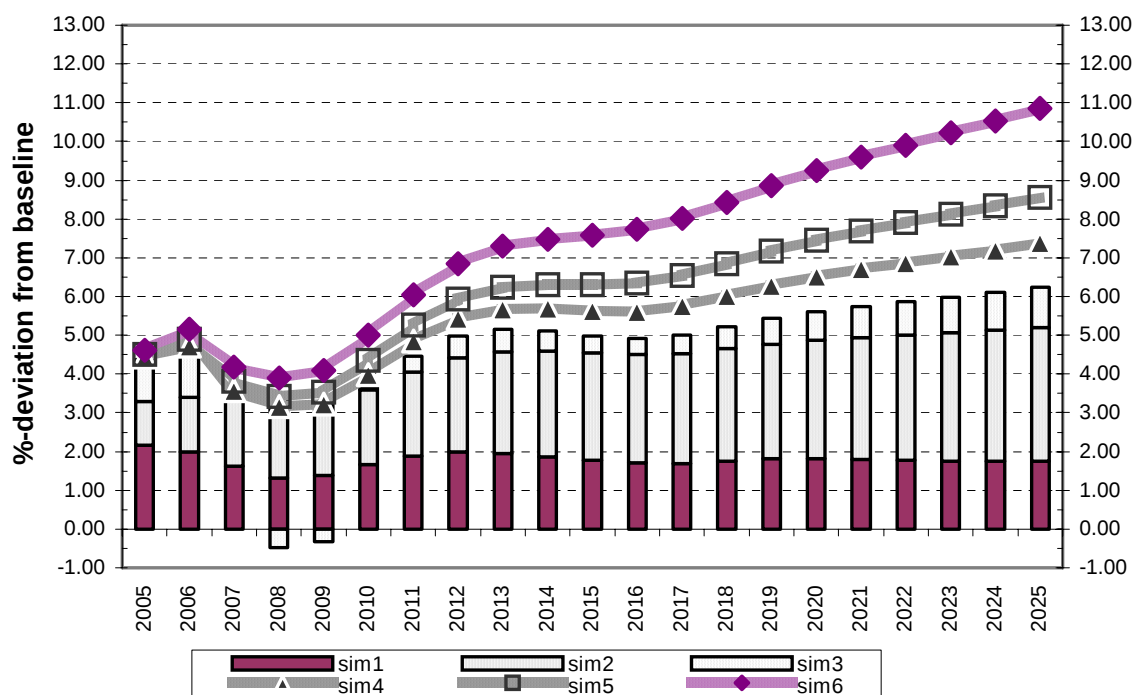


Figure 4: Consumption per capita - Deviations from baseline in CEA's

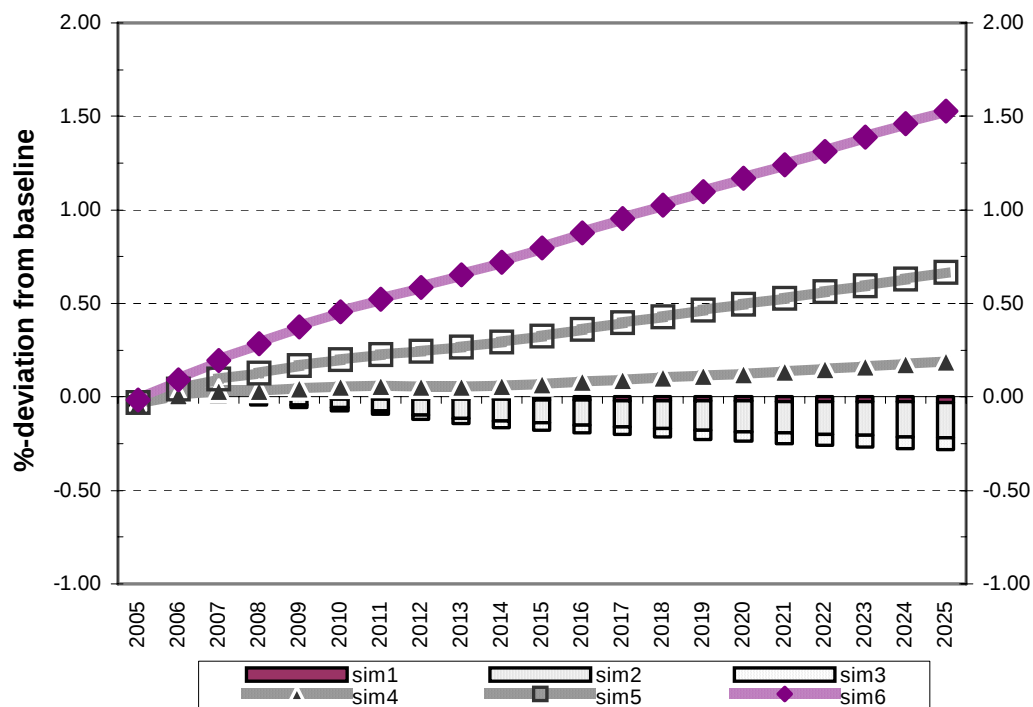


Figure 5: Deviation of GDP from baseline in the current EU

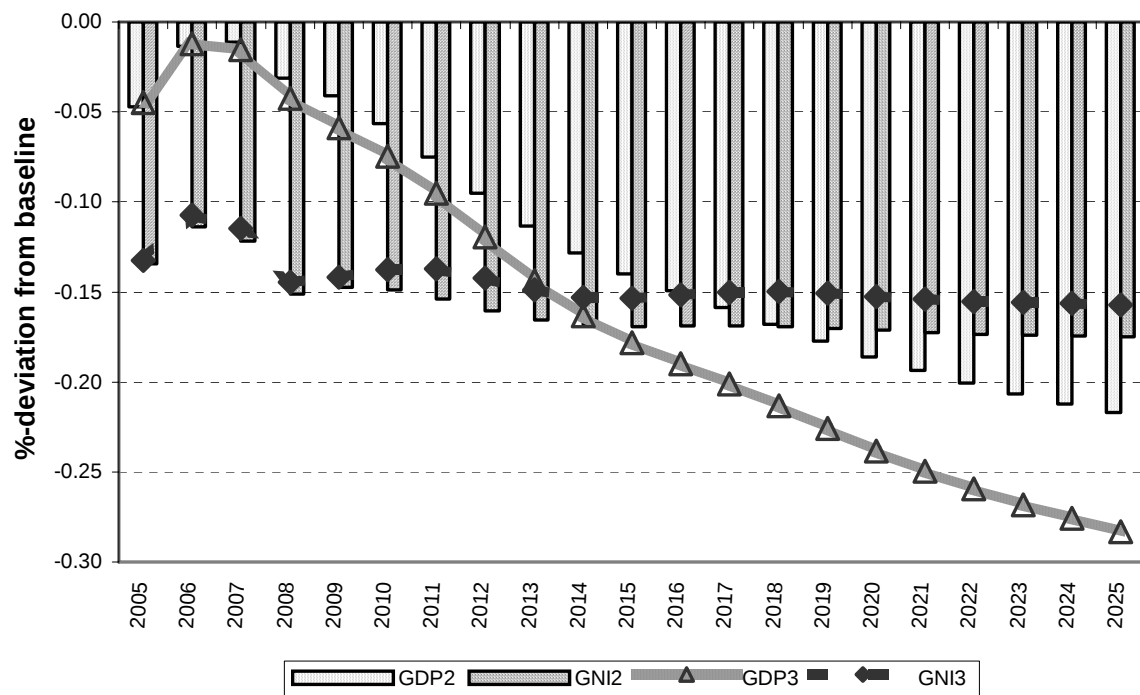


Figure 6: GDP and GNI - deviations from baseline in the current EU

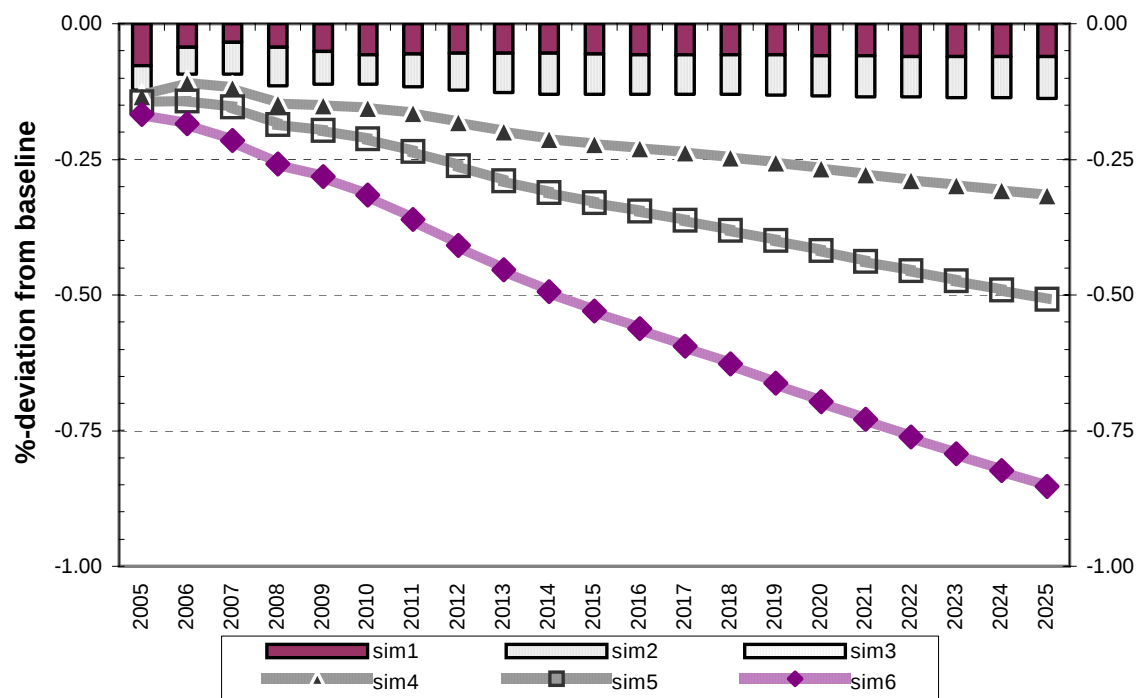


Figure 7: Consumption per capita - Deviations from baseline in the current EU