

A Prototype Model of European Integration: The Case of Austria

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1 Introduction

As an EU member state since 1995, Austria has taken part in all subsequent European integration steps: the *deepening* of EU integration via the single market and Economic and Monetary Union (EMU) with the introduction of the euro, and the *enlargement* of the EU. Since the accession of Croatia in 2013, the EU encompasses 28 member states, 19 of which have introduced the euro.

Around the years 2014 and 2015, Austria has had and will have numerous anniversaries to celebrate in connection with European integration: 25 years since the fall of the Iron Curtain and hence the opening up of Eastern Europe in 1989; 20 years of EU membership (1995); 15 years of Austria's EMU membership (1999), and 10 years of EU enlargement (starting in 2004).

In this contribution, an integration model for Austria is developed to estimate empirically the integration effects since 1989. It is an econometrically estimated macro model, capturing the main features of European integration since the opening up of Eastern Europe in 1989, namely encompassing the effects of EU accession in 1995 and the participation in EMU since 1999, as well as the effects of EU enlargement since 2004. This small integration model for Austria could also serve as a prototype for other member states of the EU.

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2 Austria's Integration into Europe

At the beginning of each integration step, several studies were undertaken in the EU and also in Austria to estimate *ex ante* the possible integration effects (for an overview of such studies, see Breuss 2012, p. 43). In the Austrian studies by the Austrian Institute of Economic Research (WIFO), simulations were carried out by means of the—at the time—actual version of the WIFO macroeconomic model.¹ This study employs a macro integration model to evaluate *ex post* the integration effects Austria has realized since the opening up of Eastern Europe in 1989, and in particular the economic impact of EU accession in 1995.

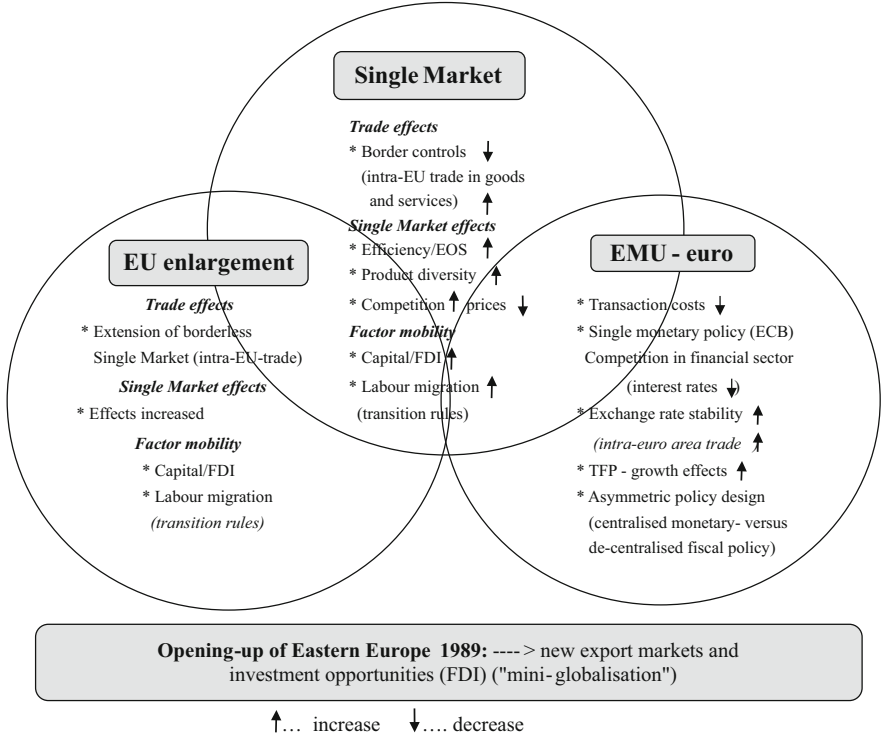
Over the last decades, European integration has systematically progressed from a customs union (completed in 1968) towards the single market, EMU, and major EU enlargements. Integration theory was either applied ahead of the actual implementation, as in the case of the EC's custom union (see Viner 1950), or had to catch up with European integration as it progressed towards the single market and the EMU projects (see Baldwin and Venables 1995; Breuss 2003a; or for a survey, see Jovanovic 2011).

Austria has taken part in all integration steps since the opening up of Eastern Europe in 1989, gaining EU membership in 1995 and EMU membership in 1999, and participating as an EU member in the EU enlargements since 2004. An overview of the possible theoretical integration effects² in the case of Austria's EU integration is illustrated in Fig. 1.

Economies of scale (EOS) played an important role at the stage of creating the single market, as did competition effects via the harmonization of competition rules concerning a common legal base. The liberalization of certain sectors and privatization were also part of the single market program. Other effects derived from the implementation of the Common Agricultural Policy (CAP), the common foreign trade policy (as a consequence of the customs union and the dismantling of border controls), and the harmonization of other policies, such as regional or structural policies. There is also the EU budget, which finances the different policy areas with a view to ensuring solidarity between member countries, implying a redistribution of funds from 'rich' EU members (net contributors) to 'poor' ones (net recipients). Overall, the single market is supposed to boost intra-EU trade and, via gains in efficiency and productivity, lead to stronger economic growth.

¹In a comprehensive *ex ante* study Breuss et al. (1994) estimated the potential macroeconomic and sectoral effects of Austria's EU accession with the WIFO macro cum input–output model. Keuschnigg and Kohler (1996) estimated, also *ex ante*, the possible Austrian integration effects of EU accession with a single-country dynamic general equilibrium model (sectoral and macroeconomic results).

²A detailed overview of integration theories applicable for the several steps of European integration can be found in Badinger and Breuss (2011) and in Breuss (2014).



EOS . . . economies of scale; FDI . . . foreign direct investments; TFP . . . total factor productivity.

Fig. 1 Effects of Austria’s EU integration. (Overview of the theoretical integration effects)

Across the large number of existing integration studies, single market effects are estimated using different methods and approaches: macroeconomic models and/or microeconomic models, both for individual countries (country studies with single-country models) and/or for several countries (multi-country models). Among the model approaches there are macro models or general equilibrium models. Within the modern theory of endogenous growth, there are special derivations for the growth effects of integration (see Breuss 2003a).

A step that is more complicated is the assessment of the integration effects originating from the EU’s Economic and Monetary Union (EMU) and the introduction of the euro as a common currency. In this respect, theory is virtually entering uncharted waters. A relatively well-developed theory is that of ‘optimal currency areas’ (OCAs), exploring which countries would be in a sustainable position to share a common currency. Early studies arrived at the conclusion that in Europe only a small number of OCAs would be able to survive (see Breuss 2006). As the current euro-area crisis painfully demonstrates, the euro project was driven by political considerations rather than being founded on the basis of sound economic criteria.

Shortly before the fourth round of EU enlargement to include Austria, Finland, and Sweden in 1995, the EU—confronted with historical events such as the collapse of communism and the fall of the Iron Curtain—was virtually forced to integrate the former Soviet satellite countries of Eastern Europe. Those countries were then gradually integrated into the EU single market, first by Europe agreements and later by formal EU accessions, starting in 2004.

The effects of the three integration steps, the single market, the EMU, and EU enlargement, overlap, as illustrated in Fig. 1. Austria, then still a member of EFTA, was already benefiting from the opening up of Eastern Europe towards the West in 1989. This event suddenly facilitated access to Eastern markets that hitherto had been severely constrained by the ‘Iron Curtain,’ offering new opportunities for export and foreign direct investment (FDI). Since the opening up of Eastern Europe, Austria has to a greater extent than before taken part in globalization (‘mini-globalization’) as it has moved from a marginal position into the center of Europe. Austria’s accession to the EU in 1995 and to the EMU in 1999 augmented the benefits already obtained through the opening up of new markets via the 1989 revolution. These effects were reinforced again by the EU enlargement rounds of 2004 and 2007. Austria’s ever deeper integration into the EU has, via the operation of the manifold integration effects, in almost all cases led to higher economic growth and greater prosperity.

3 An Integration Model for Austria

To evaluate quantitatively ex post the integration effects Austria has realized in the past, an integration model has been designed. The integration effects derived in this way represent the deviations of actual economic developments in Austria from the hypothetical path that the economy would have followed had Austria remained apart from all integration moves since 1989. The integration model for Austria applied here is a small macro model econometrically estimated with EViews 7.0 for a dataset over the period 1960–2015. The detailed set of equations can be found in Appendix 1. This integration model for Austria could also be used as a prototype for other EU member states to evaluate their integration effects.³

³To estimate ex post the integration effects of Austria’s EU membership, on earlier occasions a similar small country macro model approach has been applied (Breuss 2010a, 2013c). In the case of a comparison of the integration performance of Austria, Finland, and Sweden in the EU (Breuss 2003b), and for the evaluation of the EU accession of Bulgaria and Romania (Breuss 2010b), small macro-integration models of a similar type as the present integration model were estimated to simulate the specific integration features of these countries.

Table 1 Model inputs for simulating integration effects for Austria

Scenarios		Integration effects	Model inputs
1	Opening up 1989	Trade and FDI Net migration	Regime change T+FDI Migration 1989–1993
2	EU member 1995	Increased price competition TFP-stimulating R&D Trade and FDI EU net budget position	Mark-up decreasing since 1995 Regime change R&D Regime change T+FDI Av. -0.25% GDP since 1995 Migration 1995–2015
3	EMU member 1999	More competitiveness trade and FDI TFP-stimulating R&D	No appreciation since 1999 Regime change T+FDI Regime change R&D
4	EU enlargement 2004/07	Trade and FDI Net migration	Regime change T+FDI Migration 2004–2015

‘Regime change T+FDI’ = regime change dummy variable for trade and FDI; ‘Regime change R&D’ = regime change dummy variable for research and development (R&D); TFP = total factor productivity. For detailed data inputs, see Appendix 2

3.1 Four Integration Steps Since 1989

We evaluate the integration effects of Austria’s European integration with reference to the major variables of the macro model, in particular to the impact on real GDP. Real GDP per capita is our final ‘welfare’ measure. The four steps of Austria’s deep integration into Europe since 1989 is evaluated in scenarios (see Table 1).

3.1.1 Opening Up of Eastern Europe in 1989

The opening up of Eastern Europe in 1989 increased the potential of Austria’s markets for direct trade and FDI, and implied a net inflow of migrants. Scenario 1 therefore takes into account two effects:

- *Trade and FDI effects:* To capture the trade and FDI effects, we introduce a ‘regime change’ variable⁴ (‘Regime change T+FDI’ or the dummy ‘D_1989_2015’ in the trade and FDI equations in the integration model of Appendix 1), which takes the value of 1 until 1988, then increases by 0.1 in each following integration step; thus, in 1989 it increases to 1.1, remains at this level until 1994, and jumps to 1.2 in 1995, in 1999 to 1.3, in 2004 to 1.4, and in 2007 to 1.5, remaining at this level until 2015. In the simulations of the

⁴The literature treats ‘regime changes’ in the context of ‘regime switching models’ using Markov chain econometrics (e.g., see Hamilton 2008). Generally, many economic time series occasionally exhibit dramatic breaks in their behaviour, associated with events such as financial or other crises. In our case, the breaks occurred due to four integration shocks (1989, 1995, 1999, and 2004/07) of European integration.

‘opening-up’ scenario, the regime change dummy was reduced to 1 from 1989 until EU enlargement began (see Appendix 2). This regime change dummy can be interpreted as a ‘smart dummy’ (capturing price and non-price effects of trade liberalization vis-à-vis the Central and Eastern European Countries, CEECs) and is included in the estimations of the equations for real exports and imports, for FDI exports and imports. In line with the insights of the ‘New’ New Trade Theory (see the application in the TTIP evaluation by Felbermayr et al. 2013), in our model more trade engagement translates indirectly via the R&D equation into an increase in total factor productivity (TFP) and hence has an accumulation or growth effect, leading to higher real GDP.

- *Net migration*: Besides the trade and FDI effects, the opening up of Eastern Europe in 1989 also had net migration effects. As can be seen from Appendix 2, the biggest net inflow of migrants occurred shortly after the collapse of the former Yugoslavia in the early 1990s. In the integration model, net migration inflows enter exogenously via the unemployment equation into labor supply. Migration also affects the definition of GDP per capita via the variable population (see Appendix 1).

3.1.2 EU Membership in 1995

A new EU member must take over the *acquis communautaire* (Community *acquis*) of the single market project. This implies communitization, i.e., the transfer of competencies, from former national responsibility to EU competence in many economic policy areas: the CAP, the Common Commercial Policy (CCP) by entering into the EU customs union, the common competition policy, and a common regional/structural policy, and many other areas in which economic policy is harmonized at the EU level.

In scenario 2, Austria’s EU membership is captured by five inputs:

- *Greater price competition*: Entering into the single market increases price competitiveness, which is captured by reducing the mark-up on unit labor costs.⁵ We assume that the mark-up in the case of Austria’s EU membership increased strongly in the beginning and tapered off later. In the simulations, the dummy variable for price mark-up was reduced in value from 1.3 pre-accession to 1.2 in 1995, to 1.1 in 1996, and to 1.0 in 1997 (see Appendix 2). The main result is that consumer prices decline, but the real GDP effects are negligible.
- *TFP-stimulating R&D expenditures*: EU membership has improved the opportunities for Austrian research institutions (universities and non-university institutions and firms) to participate fully in EU research programs (Framework

⁵Badinger and Breuss (2005) analyzed the sectoral change of mark-up pricing after EU accession in Austria. The results were mixed. Some sectors had pronounced mark-up reductions (mining and quarrying, wholesale and retail trade, financial services and real estate), whereas in other sectors no notable mark-up change was found.

Programmes). This resulted in a break in the trend of R&D expenditures in % of GDP. After EU accession, the R&D trend was much steeper than in the pre-EU period. These additional R&D opportunities are captured by another ‘smart dummy,’ namely the variable ‘Regime change of R&D’ (or the dummy ‘D_1995_2015’ in the R&D equation in the integration model; see Appendix 1). Due to participation in the EU’s research programs, the R&D dummy jumps in 1995 from 1 to 1.1 (see Appendix 2). In our model context, more R&D stimulates TFP and hence real GDP growth.

- *Trade and FDI:* A country entering the EU and hence the single market must also enter into the EU customs union with its common external tariff (CET). In the case of Austria, this implied a reduction in the average tariff rate from 10.5 % to the CET level of 5.7 % before the cut in the context of the Uruguay Round in 1995. Besides the minor reduction in import tariffs, the major reduction concerned the abolition of border controls, resulting in cost savings for firms engaged in foreign trade. All price and non-price (NTBs) changes in connection with EU accession should be captured with our ‘smart dummy’ variable ‘Regime change T+FDI.’ In the simulations, the T+FDI dummy was increased from 1.1 to 1.2 in 1995 (see Appendix 2). Participation in the EU’s single market of course improves the opportunities to expand foreign trade. But this is not a one-sided affair. The opening up of borders (abolition of border controls) drives competitive importers into the market of the newcomer. On balance, Austria gained from full participation in the CAP, but overall the trade balance vis-a-vis the EU deteriorated following 1995. In addition to trade, bilateral FDI flows also increased after EU accession. After a phase of adjustment to the fiercer competition in the single market, Austria’s current account position improved.
- *EU net budget position:* Austria, as the second richest country in the EU (measured by GDP per capita in PPS), is of course a net payer into the EU budget. On average, over the period 1995–2015, it contributed 0.25 % GDP more to the EU budget than it received in transfers out of the EU budget (see Appendix 2).
- *Net migration:* This effect was rather modest vis-a-vis the EU. After German unification, an increasing number of workers from Germany entered the Austrian labor market. In our simulation, we considered (exogenously) the amount of net migration above the normal trend and interpreted this development to have been caused by EU accession (see Appendix 2).

3.1.3 EMU Membership in 1999

Participating in the EMU and thus introducing the euro further deepened economic integration. Prior to EMU membership, the hard currency countries Germany and Austria suffered from international competitiveness insofar as the soft currency countries (in the periphery of the EU) depreciated their currencies against the DM

bloc in every case of current account deterioration. Of course, a devaluation race was a permanent menace for the single market. After the introduction of the euro, this was no longer possible and hence the international competitiveness was reversed within the euro area. Germany and Austria gained in the form of real depreciation, whereas the others revaluated and lost competitiveness. In addition to this advantage in the competitiveness of the formerly hard currency countries, a single currency eliminates exchange rate uncertainties, thus stimulating trade and FDI. Above all, the deeper financial integration offered new growth-enhancing stimuli via TFP-stimulating R&D growth. In scenario 3, therefore, the following three effects are considered:

- *Greater competitiveness:* The improvement of competitiveness of Austria as described above is captured by the assumption that the 1999 EMU membership led to a cessation of real appreciation (see Appendix 2).
- *Trade and FDI:* The euro's pro-trade effect—described in the theoretical part above—is captured by the 'smart dummy' variable 'Regime change T+FDI.' In the simulations, the dummy variable was increased from 1.2 to 1.3 in 1999.
- *TFP-stimulating R&D expenditures:* In addition to and on top of the growth effect of the participation in the EU's single market, the participation in the EMU is also assumed to have stimulated TFP and hence real GDP growth via an additional increase in R&D because of the stronger participation in EU research programs. In the simulations, the R&D dummy was increased from 1.1. to 1.2 in 1999.

3.1.4 EU Enlargement in 2004/2007

As a member of the EU, Austria also benefited from the major enlargement moves in 2004 and 2007, primarily because this involved mainly former Central and Eastern European countries (CEECs) in Austria's neighborhood. Two main effects were encountered: with the abolition of border controls, Austria was able to increase its trade potential in addition to the effects already happening as a result of the opening up of Eastern Europe in 1989.⁶ Integration of low-income countries into the group of high-income countries in the old EU naturally induced factor movements in both directions: FDI from the West to the East, and labor migration the other way round. To mitigate the negative effects on the labor markets, many old EU member states, including Austria, applied exemption rules from freedom of labor in the form of 7-year transitional arrangements. These transition periods were phased out in the

⁶Prior to EU accession, candidate countries of the 2004 and 2007 enlargements had already abolished trade tariffs with the old EU member states in the context of the asymmetric liberalization process of the Europe agreements (EAs): The EU eliminated tariffs and NTBs on imports from the CEECs in 1997, and the CEECs did so by 2002. After EU accession, the new member states entered the customs union of the EU and participated in the EU's single market program. That meant, on the one hand, adjustments of the national external tariff to EU's CET and the abolition of border controls. Hence, the remaining trade costs were eliminated.

first round of enlargement in 2011 and in 2014 for the second round (Bulgaria, Romania).

In scenario 4, we consider only two integration effects: trade and FDI, and net migration:

- *Trade and FDI*: These effects are captured in the ‘smart dummy’ variable ‘Regime change T+FDI.’ Starting in 2004, this dummy variable was increased in the simulations from the former EMU membership value of 1.3 to 1.4; in 2007, due to the next round of EU enlargement, it was increased to 1.5.
- *Net migration*: In spite of the 7-year transitional exemptions, Austria was already attracting many specialized workers at the start of the fifth EU enlargement in 2004. Therefore, in the simulations we implemented (exogenously) positive net migration inflows above the normal trend from 2004 (see Appendix 2).

3.2 Model Results

The econometrically estimated integration model for Austria (Appendix 1) was implemented using EViews 7.0 for the period 1960–2015. The main data source is the AMECO database by the European Commission, including the latest forecast to 2015. The net migration data are provided by Statistik Austria.

3.2.1 Opening Up of Eastern Europe in 1989

The fall of the Iron Curtain was a windfall gift for the Austrian economy. This historic event provoked the already existing Habsburg or ‘k.u.k Monarchy’ effect. Austria quickly used these new opportunities for trade and FDI. In the model simulations (Fig. 2 and Table 2), the opening up resulted in an increase in real GDP of 0.2 percentage points per year. This created additional jobs and reduced unemployment. The current account position improved.

3.2.2 EU Membership in 1995

The main step in EU integration was when Austria became an EU member. The full exploitation of the integration effects of participation in the single market resulted in an increase in real GDP of 0.6 percentage points per year. Due to fiercer competition, inflation went down. Furthermore, 12,000 jobs could be created per year and thus unemployment decreased considerably. However, due to the confrontation with strong competitors from the old EU member states, the current account deteriorated.

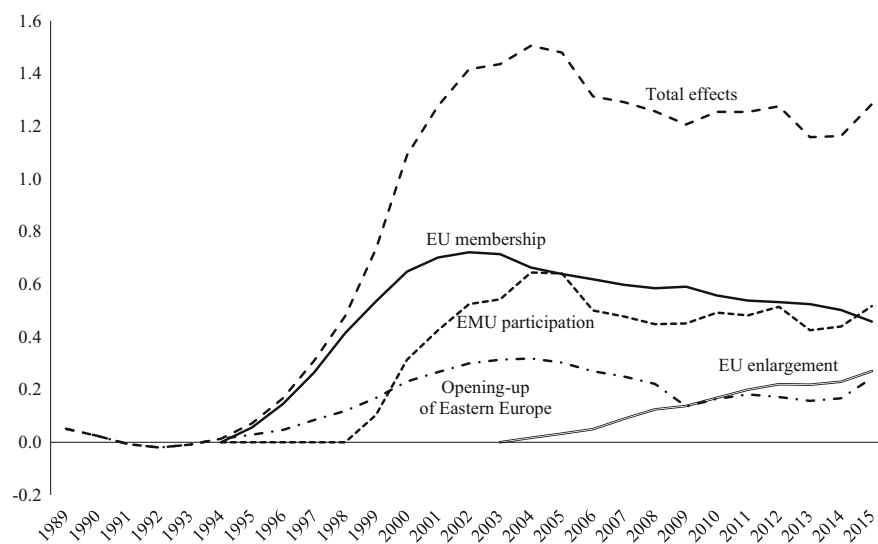


Fig. 2 Effects of Austria's participation in all steps of EU integration from 1989 (GDP, volume, percentage changes per annum)

3.2.3 EMU Membership in 1999

In addition to EU membership, the participation in the EMU and adoption of the euro added a further 0.5 percentage points per year to real GDP. Our results are similar but somewhat below those of McKinsey Germany (2012). Accordingly, Austria benefited the most from the euro (7.8 % more real GDP growth over a 10-year period, or 0.8 % per year), followed by Finland (6.7 %), Germany (6.4 %), and the Netherlands (6.2 %). The eurozone has gained 3.6 % in 10 years. The McKinsey study evaluates four categories of euro effects: (1) reduction in transaction costs (low effects on GDP); (2) intra-euro area trade effects; (3) competitiveness (this effect is high for Germany and also (as in our model) in Austria; it is negative for the soft-currency countries, such as Italy), and (4) the interest rate effect (this effect is low for Germany and Austria because the common interest rate of the euro area was based on that of Germany; it was high for the countries with high pre-EMU interest rates, such as Italy, and other countries in the euro area periphery).

3.2.4 EU Enlargement in 2004/2007

EU enlargement complemented the already ongoing advantages from the opening up of Eastern Europe for Austria. Real GDP could be increased additionally by 0.2

Table 2 Effects of Austria's participation in all steps of EU integration from 1989. Selected macroeconomic indicators

	Real GDP		CPI (inflation)	Employment total	Unemployment		Current account balance	Budget balance	
	Percent	Bn EUR 2005 prices			Percent	Percent in 1000			Rate
Opening-up of Eastern Europe 1989—25 years									
1989–2015									
Cumulated	4.72	12.73	0.40	2.02	84.91	–0.52	–20.11	2.10	0.25
p.a.	0.18	0.49	0.02	0.08	3.27	–0.02	–0.77	0.08	0.01
EU Membership 1995—20 years									
1995–2015									
Cumulated	12.72	31.84	–5.07	6.06	244.7	–1.36	–49.41	–10.5	0.56
p.a.	0.58	1.59	–0.25	0.30	12.23	–0.07	–2.47	–0.53	0.03
EMU Membership 1999—15 years									
1999–2015									
Cumulated	9.30	24.00	0.80	3.86	159.18	–1.00	–38.05	–4.06	0.55
p.a.	0.53	1.50	0.05	0.24	9.95	–0.06	–2.38	–0.25	0.03
EU enlargement 2004 and 2007—10 years									
2004–2015									
Cumulated	2.44	6.71	–0.02	1.07	45.49	–0.17	–5.53	0.02	0.31
p.a.	0.20	0.61	0.00	0.10	4.14	–0.02	–0.50	0.00	0.03
Overall integration effects since 1989—25 years									
1989–2015									
Cumulated	28.55	62.65	–4.45	12.64	480.43	–2.70	–92.70	–10.23	1.44
p.a.	0.94	2.41	–0.17	0.49	18.48	–0.10	–3.57	–0.39	0.06

percentage points per year. Most studies on EU enlargement find a 1:10 rule. This means that the welfare gains of the newcomers are 10 times higher than those of the incumbent EU member states (see Breuss 2002; similarly, Levchenko and Zhang 2012⁷).

3.3 Overall Effects of Austria's EU Integration Since 1989

Due to the processes of the opening up of Eastern Europe, EU accession, EMU membership, and EU enlargement running in parallel, the integration effects of the different stages partly overlap. Hence, the various integration effects do not simply add up. All in all (see Table 2), the integration stages considered here accelerated the growth in real GDP (and only marginally less real GDP per capita) in Austria by 0.9 percentage points per year (equivalent to €2.4 billion at 2005 prices), and created around 18,000 jobs each year.⁸ The unemployment rate shifted downwards by 0.1 percentage points per year and the rate of inflation by 0.2 percentage points. The ratio of imports to GDP increased altogether more than the export ratio. The entire integration process led to a weaker current account balance, mainly brought about by EU membership and EMU participation, but partly offset by the opening up of Eastern Europe. The latter factor and EU enlargement improved Austria's opportunities to participate actively in the process of globalization (or in 'mini-globalization' with regard to Eastern Europe).

The trend of the simulated effects of Austria's integration into the EU shows that for each major integration step (EU membership in 1995 and EMU participation in 1999), the growth effects are high in the beginning and subside thereafter (see Fig. 2). Only in the case of the opening up of Eastern Europe is there a rather stable positive impulse on Austria's economic growth, and the integration effects of EU enlargement in 2004 and 2007 have not yet diminished. The growth effects of Austria's EU membership and EMU participation have abated, particularly in the wake of the Great Recession of 2009 and the euro area crisis.

The effects presented in Table 2 (cumulated and annual averages) blur to some extent the 'true' profile of the integration effects by suggesting that the average growth effects cited would last permanently at that level. In reality, economic

⁷Levchenko and Zhang (2012) estimate welfare gains due to European trade integration since 2000 in the West (average +0.14 %; Austria, with +0.39 %, is the biggest winner) and in the East (+7.94 %). The biggest winners are Estonia (+17.25 %), Latvia (+11.93 %), and Bulgaria (+10.57); the welfare gains of the other CEES are below 10 %.

⁸The detailed results for the four scenarios, and also the overall results, are quite similar to those of the earlier study, which covered the period 1989–2011 (see Breuss 2012, 2013c).

integration, i.e., the accession of a country to an integrated community (EU), gives rise to initial positive growth incentives (mainly due to a necessary adjustment and productivity shock), which gradually fade. We therefore observe, as a rule, ‘falling marginal returns’ for integration. Even after the growth effects have faded away, the level of income (real GDP) has been raised cumulatively by 29 % (or by €63 billion at 2005 prices) as a result of participation in all integration steps over the 25 years since the opening up of Eastern Europe. At the same time, real GDP per capita (welfare) increased cumulatively by 28 % or by €7000. However, the welfare gain brought about by participation in European integration is defined not only by the level and growth of GDP per capita: it also includes the increase in the variety of goods and services supplied and options for individual action (free movement and the Schengen Agreement facilitate labor mobility and travel, the latter also benefiting from the common currency), as well as the modernization of the political system by introducing the European dimension. Moreover, full participation in the EU single market implies permanent downward pressure on prices and raises private household purchasing power. This effect is prolonged, and is reinforced by each round of EU enlargement and the accompanying extension of the single market. In contrast to the suggestion by some authors of the new growth theory of foreign trade, integration is found to have no permanent effects on growth rates, but provides one-off incentives for economic growth, which raise the level of GDP initially but ebb thereafter.

According to the calculations in this study, Austria has benefited economically from all stages of integration (opening up of Eastern Europe, EU membership, EMU participation, and EU enlargement). The integration effects derived from model simulations for Austria’s participation in all EU integration moves are in the order of $\frac{1}{2}$ to 1 percentage point of additional GDP growth per year. However, not all parts of the Austrian economy have profited equally from EU integration. The primary winners are those companies heavily engaged in the new EU member states. An indication is the decline in the wage share since the 1980s. The ‘mini-globalization’ has clearly exerted pressure on wages (see Breuss 2010c).

The plausibility of these model results is confirmed when Austria’s economic performance is compared to that of other countries inside or outside the EU: Austria’s growth advantage vis-à-vis Germany and Switzerland roughly corresponds to the above-cited integration effects. This ‘growth dividend’ is difficult to explain—if it can be explained at all—when abstracted from the integration effects of Austria’s participation in all EU policy moves.

4 Conclusions

The euro area crisis has confronted the EU with new challenges. The previous governance architecture of the EMU did not withstand the test of the crisis. To prevent the euro area from breaking up, the governance of the EMU has been readjusted to make it more resilient to future shocks. High on the agenda are the

convergence of competitiveness among euro countries (monitored and steered by the new procedure for ‘excessive macroeconomic imbalances’ within the framework of the Six-Pack and Two-Pack reforms—ideally heading towards a homogeneous European business cycle), and in particular the longer-term reduction of the (in some periphery countries) unsustainably high government debt, coupled with the containment of the debt dynamics through the instruments of the Six Pack (reform of the Stability and Growth Pact) and accompanying measures provided for by the Fiscal Compact (e.g., debt brakes at the national level). Beyond the tools for the closer coordination and centralization of fiscal policy, the EU—and notably the euro area—have the European Stability Mechanism (ESM) at their disposal and are ready to embark on ‘banking union’ (see Breuss et al. 2015), with common bank supervision, resolution, and deposit guarantee at the EU level. Whether the EU will move even further (as suggested in the plans to reform the EMU by Barroso and Van Rompuy) in the direction of centralization (‘political union’ or the ‘United States of Europe’) is still open (for more, see Breuss 2013a, b). For some member countries, such development may go too far and would provoke their early withdrawal (e.g., the UK), or deepen the rifts within the EU and the euro area that have emerged since the crisis.

In any case, historical studies on the reduction of public debt do not bode well for Europe from a medium- and longer-term perspective. All measures to slash government debt by means of fiscal austerity (expenditure cuts and tax increases, as foreseen by the Six-Pack reforms and the Fiscal Compact) may dampen medium- and long-term economic growth (see the extremely negative results in Greece).

Due to these negative perspectives, the ‘growth dividend’ that Austria has enjoyed in the past, benefiting from its strong involvement in Eastern European ‘emerging markets,’ may gradually wane. As already signaled by current medium-term projections, the new member countries in Eastern Europe may also move onto a slower growth path, as they will be affected indirectly by the euro area crisis and the negative side effects of its resolution (notably the collective de-leveraging), and the ad hoc break-out of political crises, such as that in the Ukraine, and the ensuing tensions between the EU and Russia.

Appendix 1: The Estimated Integration Model for Austria

Real GDP (Cobb–Douglas production function; bn. EUR, 2005 prices)

$$\text{GDPR} = (\text{TFP}) * ((K^{0.26}) * (\text{EE}^{0.74}))$$

Total factor productivity (TFP)

$$\text{DLOG}(\text{TFP}) = -0.0117597194657 + 0.975350400527 *$$

$$\text{DLOG}(\text{AP}) + 0.00368866066045 * \text{RAD} + 0.000364739422324 * \text{D}(\text{XQUOTA})$$

Research & development: R&D in % of GDP

$$\text{RAD} = -0.771758304314 + 0.0900123360683 *$$

$$\text{LOG}(\text{GDPR}) + 0.918022689413 * \text{RAD}(-1) + 0.450963636885 * \text{D_1995_2015}$$

Private consumption deflator

$$\text{DLOG}(\text{PCN}) = 0.974494644295 * \text{DLOG}(\text{CPI}) - 0.0100090054202 * \text{D_2002}$$

Private consumption index: National definition

$$\text{DLOG}(\text{CPI}) = 0.00685148354097 + 0.210308218697 * \text{MARKUP} *$$

$$\text{DLOG}(\text{ULC}) + 0.232379177613 * \text{MARKUP} * \text{DLOG}(\text{PM}) + 0.407094518941$$

$$* \text{DLOG}(\text{CPI}(-1)) + 0.014977340126 * \text{D_1984}$$

Harmonized index of consumer prices: HICP

$$\text{DLOG}(\text{HICP}) = 0.974397164556 * \text{DLOG}(\text{CPI})$$

GDP deflator

$$\text{DLOG}(\text{PGDP}) = 0.883285761406 * \text{DLOG}(\text{CPI}) + 0.432199804412 *$$

$$\text{DLOG}(\text{PX}) - 0.275658593485 * \text{DLOG}(\text{PM})$$

Wage per employee (Phillips curve)

$$\text{DLOG}(\text{WE}) = -0.00688732197519 + 0.658922532489 *$$

$$\text{DLOG}(\text{CPI}) + 0.439378457835 * \text{DLOG}(\text{AP}(-1)) + 0.0643927893279 * 1 /$$

$$\text{U} - 0.059812308921 * \text{D_1980}$$

Wages

$$\text{WN} = (\text{WE} * \text{E}) / 1000$$

Taylor rule for the euro area

$$\text{RSH_EA18} = 2 + \text{DLOG}(\text{HICP_EA18}) * 100 + 0.5 * (\text{DLOG}(\text{HICP_EA18}) * 100 - 2.0) + 0.5 * (\text{DLOG}(\text{GDPR_EA18}) * 100 - 1.5)$$

Interest rate, short-term

$$\text{RSH} = -5.5262147236 + 0.667905535844 * \text{RSH_EA18} + 0.0136803208004 *$$

$$\text{LOG}(\text{CPI}) * 100 - 2.35378845633 * \text{D_1983}$$

Interest rate, long-term

$$\text{RLH} = 0.400105575997 + 0.23428902887 * \text{RSH} + 0.152448613707 *$$

$$\text{DLOG}(\text{CPI}) * 100 + 0.674036427571 * \text{RLH}(-1)$$

Capital demand

$$\text{DLOG}(\text{K}) = 0.000347597990373 + 0.000690816072569 *$$

$$\text{D}(\text{BUD}) - 0.000555726084856 * \text{PRDEF} + 0.10749650936 *$$

$$\text{DLOG}(\text{GDPR}) + 0.000211122052822 * \text{D}(\text{DLOG}(\text{WE}) *$$

$$100 - (\text{RLH} - \text{DLOG}(\text{PGDP}) * 100)) + 0.879984556303 * \text{DLOG}(\text{K}(-1))$$

(continued)

Capital coefficient: K/Y

$$KY = (K / \text{GDPR})$$

Labor demand (total employment)

$$\text{DLOG}(\text{EE}) = 0.174447800692 * \text{DLOG}(\text{GDPR}) - 0.0646686954094 *$$

$$\text{DLOG}(\text{WE}) + 0.00183780684966 * \text{D}(\text{BUD}) + 0.688076954685 *$$

$$\text{DLOG}(\text{EE}(-1))$$

Labor demand (employees)

$$\text{DLOG}(\text{E}) = -0.0020926578709 + 0.787853784774 *$$

$$\text{DLOG}(\text{EE}) + 0.174748348465 * \text{DLOG}(\text{GDPR}) + 0.262099988497 *$$

$$\text{DLOG}(\text{E}(-1))$$

Labor supply: Labor force

$$\text{LS} = \text{EE} + \text{US}$$

Labor productivity (total economy)

$$\text{AP} = (\text{GDPR} / \text{EE})$$

Unit labor costs

$$\text{ULC} = (\text{WN} / \text{GDPR})$$

Unemployment rate (Okun's law)

$$\text{D}(\text{U}) = 0.0856028080042 - 7.48943374025 *$$

$$\text{DLOG}(\text{GDPR}) + 0.00304288354196 *$$

$$\text{D}(\text{POP} - \text{MIGR_OST89} - \text{MIGR_EU95} - \text{MIGR_EUEW04}) + 0.804600244209$$

$$* \text{D_1982} - 0.0362182637141 * \text{BUD}$$

Unemployment, total in 1000 persons

$$\text{US} = ((\text{U} * \text{LS}) / 100)$$

Exports of goods and services, total, real

$$\text{DLOG}(\text{XGSR}) = -0.0436572302437 + 2.22907387142 *$$

$$\text{DLOG}(\text{GDPR_EU28}) - 0.555430829575 *$$

$$\text{DLOG}(\text{REER_IC37}) + 0.0393558155438 * \text{D_1989_2015}$$

Exports of goods and services, total, nominal bn. EUR

$$\text{XGSN} = \text{XGSR} * (\text{PX} / 100)$$

Export quota: Exports goods and services in % of GDP

$$\text{XQUOTA} = (\text{XGSN} / \text{GDPN}) * 100$$

Imports of goods and services, total, real

$$\text{LOG}(\text{MGSN}) = -5.3567516112 + 1.77756769413 *$$

$$\text{LOG}(\text{GDPR}) + 0.228751889216 * \text{D_1989_2015}$$

Imports of goods and services, total, nominal bn. EUR

$$\text{MGSN} = \text{MGSN} * (\text{PM} / 100)$$

Import quota: Imports goods and services in % of GDP

$$\text{MQUOTA} = (\text{MGSN} / \text{GDPN}) * 100$$

Current account in nominal bn. EUR (AMECO)

$$\text{CA} = \text{XGSN} - \text{MGSN}$$

Current account in % of GDP (AMECO)

$$\text{CAGDPN} = ((\text{XGSN} - \text{MGSN}) / \text{GDPN}) * 100$$

(continued)

Current account in nominal bn. EUR (OeNB)

$$CA_OeNB = CA - CA_Diff_to_OeNB$$

Current account in % of GDP (OeNB)

$$CA_OeNBGDPN = ((CA_OeNB) / GDPN) * 100$$

FDI outflows in % of GDP

$$FDIEX = 0.375640070717 + 1.02837425753 * D(FDISOUT)$$

FDI outward stocks in % of GDP

$$FDISOUT = -23.7147058544 + 0.883784157118 *$$

$$FDISOUT(-1) + 23.3682906272 * D_1989_2015$$

FDI inflows in % of GDP

$$FDIIN = 0.671986218682 + 0.84990945751 * D(FDISIN)$$

FDI inwards stocks in % of GDP

$$FDISIN = -28.0471754242 + 0.810412880324 * FDISIN(-1) + 28.0293244537 * D_1989_2015$$

Net household disposable income, nominal (bn. EUR; OECD Economic Outlook; Macrobond)

$$YDN = 2.18851454149 + 0.11686303161 * GDPN + 0.817157924902 *$$

$$YDN(-1)$$

Net household disposable income, real (bn. EUR)

$$YDR = (YDN / (PCN / 100))$$

GDP, nominal (bn. EUR)

$$GDPN = (GDPR * (PGDP / 100))$$

Real GDP per capita (in 1000 EUR) – WELFARE measure 1

$$GDPRPC = ((GDPR * 1000) / (POP - MIGR_OST89 - MIGR_EU95 - MIGR_EUEW04))$$

GDP per capita in PPS (EU-28 = 100) – WELFARE measure 2

$$LOG(GDPPC_PPSEU28) = 0.43328354923 + 0.00346210004573 *$$

$$DLOG(GDPRPC) + 0.911257550549 *$$

$$LOG(GDPPC_PPSEU28(-1)) - 0.0461887756332 * D_2001$$

Budget position: Budget balance in % of GDP

$$BUD = -1.28851868518 + 0.354920098741 * DLOG(GDPR) *$$

$$100 - 0.594239170511 * ELEC + 0.700806989349 * BUD(-1) - 2.70112458588 * D_2004$$

Budget position: Budget balance in % of GDP incl. Net contribution to EU budget

$$BUDNET = BUD + NETEU$$

Austria–EU Budget position absolute values in bn. EUR

$$NETEUABS = (NETEU * GDPN) / 100$$

Public debt dynamics: Gross public debt in % of GDP

$$(DEBT = DEBT(-1) - PD - (r - g) * DEBT(-1) + SF \text{ (Stock flow)})$$

$$DEBT = DEBT(-1) - PRDEF + SNOW + SF$$

Primary budget balance in % GDP

$$PRDEF = BUD - INTEREST$$

(continued)

Interest payments in % of GDP

$$\text{INTEREST} = 0.187508058025 + 7.27693766331 * (\text{RLH} / 100) * ((\text{DEBT}(-1)) / \text{GDPN}(-1)) + 0.893137557651 * \text{INTEREST}(-1)$$

Snow-ball effect

$$\text{SNOW} = 0.276597903339 + 0.00796005959488 * (\text{RLH} - \text{DLOG}(\text{GDPN}) * 100) * \text{DEBT}(-1)$$

Wage share: Wages in % of GDP ('Globalization' reduces LQ)

$$\begin{aligned} \text{LQ} = & 15.1699479237 - 0.0316886728056 * \\ & (\text{XQUOTA} + \text{MQUOTA}) - 0.00942994300939 * \\ & \text{D}(\text{FDISOUT} + \text{FDISIN}) + 0.791815264509 * \text{LQ}(-1) + 3.87639625065 * \\ & \text{D_1975} \end{aligned}$$

DLOG(Variable) = percentage change operator. Estimation with EViews 7.0 for the period 1960–2015. Data source AMECO database of the European Commission; PX (PM) = deflators of exports (imports) of goods and services; D_1989_2015 = 'smart' dummy 'Regime change T+FDI'; D_1995_2015 = 'smart' dummy for 'Regime change R&D'; FDI = foreign direct investment; OeNB = Austrian National Bank

Appendix 2: Quantitative Model Inputs of Four Integration Scenarios (Additional Effects Compared to the Baseline Scenario Without EU Integration)

	Scenario 1			Scenario 2			Scenario 3			Scenario 4		
	Open-1989			EU-1995			EMU-1999			EU-Enlarg-2004/07		
	T+FDI	MIGR	Mark-up	R&D	T+FDI	EU-Budg	MIGR	REER	T+FDI	R&D	T+FDI	MIGR
1989	1.1	40	1.3	1.0	1.1	0	0	103.91	1.1	1.0	1.1	0
1990	1.1	55	1.3	1.0	1.1	0	0	103.07	1.1	1.0	1.1	0
1991	1.1	73	1.3	1.0	1.1	0	0	102.55	1.1	1.0	1.1	0
1992	1.1	67	1.3	1.0	1.1	0	0	103.77	1.1	1.0	1.1	0
1993	1.1	30	1.3	1.0	1.1	0	0	110.06	1.1	1.0	1.1	0
1994	1.1	0	1.3	1.0	1.1	0	0	112.70	1.1	1.0	1.1	0
1995	1.1	0	1.2	1.1	1.2	-0.44	-2	114.80	1.2	1.1	1.2	0
1996	1.1	0	1.1	1.1	1.2	-0.15	0	113.43	1.2	1.1	1.2	0
1997	1.1	0	1.0	1.1	1.2	-0.43	-2	108.09	1.2	1.1	1.2	0
1998	1.1	0	1.0	1.1	1.2	-0.34	4	106.82	1.2	1.1	1.2	0
1999	1.1	0	1.0	1.1	1.2	-0.32	15	107.00	1.3	1.2	1.3	0
2000	1.1	0	1.0	1.1	1.2	-0.21	13	107.00	1.3	1.2	1.3	0
2001	1.1	0	1.0	1.1	1.2	-0.26	33	107.00	1.3	1.2	1.3	0
2002	1.1	0	1.0	1.1	1.2	-0.10	29	107.00	1.3	1.2	1.3	0
2003	1.1	0	1.0	1.1	1.2	-0.15	36	107.00	1.3	1.2	1.3	0
2004	1.1	0	1.0	1.1	1.2	-0.16	14	107.00	1.3	1.2	1.4	33
2005	1.1	0	1.0	1.1	1.2	-0.11	14	107.00	1.3	1.2	1.4	26
2006	1.1	0	1.0	1.1	1.2	-0.12	14	107.00	1.3	1.2	1.4	6
2007	1.1	0	1.0	1.1	1.2	-0.21	14	107.00	1.3	1.2	1.5	7
2008	1.1	0	1.0	1.1	1.2	-0.13	14	107.00	1.3	1.2	1.5	7
2009	1.1	0	1.0	1.1	1.2	-0.15	14	107.00	1.3	1.2	1.5	0

(continued)

	Scenario 1		Scenario 2				Scenario 3				Scenario 4	
	Open-1989		EU-1995				EMU-1999				EU-Enlarg-2004/07	
	T+FDI	MIGR	Mark-up	R&D	T+FDI	EU-Budg	MIGR	REER	T+FDI	R&D	T+FDI	MIGR
2010	1.1	0	1.0	1.1	1.2	-0.24	14	107.00	1.3	1.2	1.5	3
2011	1.1	0	1.0	1.1	1.2	-0.27	14	107.00	1.3	1.2	1.5	13
2012	1.1	0	1.0	1.1	1.2	-0.35	14	107.00	1.3	1.2	1.5	26
2013	1.1	0	1.0	1.1	1.2	-0.35	14	107.00	1.3	1.2	1.5	20
2014	1.1	0	1.0	1.1	1.2	-0.35	14	107.00	1.3	1.2	1.5	30
2015	1.1	0	1.0	1.1	1.2	-0.35	14	107.00	1.3	1.2	1.5	30

Scenarios: 1 = opening up of Eastern Europe 1989; 2 = EU membership 1995; 3 = EMU membership 1999; 4 = EU enlargement 2004/2007; T+FDI = dummy for 'regime change' in trade and FDI (original values: 1 until 1988; starting with 1989, 0.1 points higher with each integration step: 1989 = 1.1; 1995 = 1.2; 1999 = 1.3; 2004 = 1.4; 2007 = 1.5; MIGR = net migration (in 1000 persons) due to respective integration step; Mark-up = dummy for mark-up pricing, decreasing due to fiercer competition when participating in the EU's single market; R&D = dummy for 'regime change' in research & development (R&D) policy due to EU/EMU membership; EU-Budg = net payer position (in % of GDP); REER = real effective exchange rate (entering EMU has stopped the previous trend of appreciation; i.e., the increase in REER)

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