

Literature Review on the Economic Effects of the Euro on Austria

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The possible impact of the euro on Austria has been widely discussed, as will be shown in this literature review, which focuses above all on the impact of the euro on inflation, foreign trade and economic growth. Not surprisingly, it has been quite difficult to quantify the (specific) impact of the euro, so that the academic literature contains only few hard-and-fast statements about the currency's impact on Austria. According to the findings of the literature, the purely economic impacts of the single currency appear not to have been very large – other European integration projects that partly relate to monetary union appear to have had a stronger influence on Austria's economy.

JEL classification: E31, E42, F40,

Keywords: Economic and Monetary Union, inflation, international trade

„Generally, it is easier to conduct *ex ante* studies on economic integration than to analyse the outcome *ex post*. This is also documented by the much larger number of *ex ante* studies” (Badinger and Breuss, 2011).

This contribution aims at presenting an overview of the academic literature on the economic impact of the euro on Austria, specifically on the effects on price stabilization and foreign trade as well as economic growth and employment. That is to say, any interactions between the single currency and the economic and fiscal policies of the euro area countries are left out of account. Although many consider the introduction of the euro a wider European policy project rather than an economic policy issue alone, this study does not cover the link between the single currency and European integration policy, either. Also, as ZEW (2008) contains a comprehensive analysis of the effect of the euro on business cycle synchronization, this topic is not covered in the present study. An additional qualification of this study is that – like the bulk of the academic papers it analyzes – it is limited to presenting the quantitative impact of monetary union without evaluating the pros and cons of

monetary union. Indeed, this would require a (normative) yardstick such as the assumption of a specific welfare function.

As a starting point, the theory of optimal currency areas, or OCA theory (Mundell, 1961; McKinnon, 1963; Kenen, 1969), may serve as a theoretical basis for analyzing the effects of a monetary union, or of the costs and benefits of joining a monetary union. OCA theory was used to analyze the impact of a single European currency prior to the start of Stage Three of Economic and Monetary Union (EMU; compare e.g. European Commission, 1990).

OCA theory² postulates that the direct advantages of a monetary union are primarily microeconomic, such as the elimination of transaction costs, the reduction of exchange rate risk and volatility, and enhanced competition on account of greater price transparency. These advantages can have indirect effects on foreign trade as well as growth and employment. Lower transaction costs and reduced uncertainty may cause the volume of foreign trade and cross-border investment to expand, making it possible to allocate capital and resources more efficiently.

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² For additional information on OCA theory, see also De Grauwe (2009a).

Moreover, the increase in aggregate economic factor productivity and the reduction of the risk-adjusted rate of return may generate additional positive effects for growth and employment.

Apart from benefits, monetary union also entails costs for participating countries – by relinquishing monetary and exchange rate policy autonomy, they also lose an instrument to stabilize macroeconomic shocks. According to OCA theory, (1) the more symmetric the shocks that hit countries in a monetary union are, (2) the greater wage and price flexibility is, and (3) the more mobile the factors labor and capital are, the lower the costs of participating in a monetary union are. Additionally, the estimate of the costs of participation in a monetary union must take into account the extent to which autonomous monetary policymaking would be possible outside of monetary union, and the degree of this policy's effectiveness. Participation in Stage Three of EMU did not mean that the euro area countries switched from complete monetary policy autonomy to a common monetary policy, as prior to joining monetary union, coordination of exchange rates in the European Union (for example through the European Monetary System) already entailed restrictions, as did the peg of some countries' currencies to the Deutsche mark. Once EMU had been established, researchers focused more on the endogeneity of optimal currency areas (Frankel and Rose, 1998). The endogeneity theory postulates that the establishment of a monetary union in itself contributes to fulfillment of the OCA criteria, for instance because of its very effects on foreign trade.

To assess the economic impact of the euro, analysts must be aware that the developments in the euro area can be put down to more than just mone-

tary union; much rather, they are the result of a range of factors partly inter-related with the consequences of monetary union. In addition to, and partly before, EMU, Europe underwent a number of other integration steps, such as the deepening of the Single Market and the integration of product markets. Economic developments in euro area countries were also influenced by diverse, partly asymmetrical external shocks and the countries' respective economic and fiscal policies, which for the most part are still under the responsibility of the EU Member States.

Another problem that must be considered in econometric studies on the impact of the euro is what time to define as the starting point of effects of the euro. On the one hand, convergence was a prerequisite for monetary union, so that effects of the euro may already have occurred even before Stage Three of EMU. On the other hand, the overall effects of the euro are an amalgamation of the effects of transition to the third stage of EMU (1999) and those of the introduction of euro cash (2002). When moving to Stage Three of EMU, the national central banks transferred monetary policy sovereignty to the European System of Central Banks and irrevocably fixed the rate of conversion of their national currencies into the euro. This eliminated exchange rate volatility and all uncertainties linked to exchange rate developments. However, exchange rate-related transaction costs were not eliminated in full until euro cash was introduced in 2002. As Baldwin et al. (2008) established in connection with studies on the impact of the euro on foreign trade, the use of a single binary variable set to 1 from 1999 can, thus, distort the results of econometric studies. In the case of Austria, the adoption of Stage Three of EMU in 1999 and the

introduction of euro banknotes and coins in 2002, moreover, occurred just a few years after the opening up of Eastern Europe in 1989 and EU accession in 1995. It may be assumed that all of these events had an impact on Austria's economy, so that it is difficult to isolate the impact of the euro.

Moreover, to assess the impact of the euro, an appropriate alternative scenario must be defined, and the economic development that would have taken place under this alternative scenario must be determined. To analyze the effect of the euro on Austria, the alternative scenario might be that under which Stage Three of EMU is assumed not to have occurred. Another scenario is the move to Stage Three by all current euro area countries except Austria. For both of these scenarios, the question arises what monetary and exchange rate policy Austria would have pursued, and what effect the other countries' monetary policy would have had on Austria. A large portion of the empirical work in this field calculates the impact of the euro by taking non-euro area EU Member States as a control group. However, it is questionable whether this approach can in fact resolve all the econometric problems that crop up in this connection.³

Given the usual time lag of scientific publications, hardly any studies have become available so far that take into account the possible effects of the financial and economic crisis on the assessment of the impact of the euro. The bulk of the academic publications analyzed in this contribution assesses the first 10 years of EMU's operation and thus looks at a period characterized by unusual macroeconomic stability ("the Great Moderation").

The remainder of this contribution is structured as follows: Price stability is examined in section 1, foreign trade in section 2, and economic growth and employment in section 3. Each section begins with a discussion of the theoretically expected impacts of a common currency. Finally, empirical studies are cited to show the actual impacts that occurred in Austria. Section 4 concludes. The annex summarizes the main results of the studies reviewed in this contribution in a table. Unless explicitly stated otherwise, "the impact of the euro" is understood to mean the combined impact of reaching Stage Three of EMU and introducing euro banknotes and coins.

1 Price Stability

Like most other euro area countries (Mongelli and Wyplosz, 2008), Austria has experienced low inflation rates since the introduction of the euro. From 1980 to 1989, the average rate of inflation came to 3.8% in Austria, from 1990 to 1998 to 2.3%, and from 1999 to 2010 to 1.7%; despite numerous shocks to inflation which occurred in the past ten years (such as animal diseases, crop failures, skyrocketing oil and other commodity prices). Even if inflation was mostly stable since the introduction of the euro, even slightly declining until 2007 to 2008, this development cannot be ascribed solely to EMU. In fact, inflation rates dropped worldwide, which may be ascribable to globalization and the higher competitive pressure it entails (Breuss, 2009), a global strengthening of central bank independence, greater competition in international trade, financial market deregulation, high current account surpluses in Eastern Asia and in the OPEC

³ On this problem and on the issue of counterfactual scenarios, see also Boltho and Eichengreen (2008).

countries (Boltho and Eichengreen, 2008). However, in assessing the development of inflation in the euro area, it must be taken into account that some euro area countries regularly posted high rates of price increase before joining EMU, and that it is an extraordinary achievement for the newly established ECB to have gained a reputation as a central bank that successfully maintains price stability (De Grauwe, 2009b).

A quantitative study on the effects of EMU on the development of inflation in Austria can be found in Windberger and Zeileis (2011). The authors use statistical procedures to show that Austria experienced a structural break in inflation developments in fall 1994. In their study, Windberger and Zeileis (2011) distinguish between two time periods, namely from February 1990 to September 1994 and from October 1994 to December 2010. During the first period, the average monthly rate of inflation in Austria came to 0.255%, during the second period to 0.135%; the variance of the inflation rate was higher during the second period (0.037 compared to 0.015). Windberger and Zeileis interpret this result as follows: It is the preparations for EMU that led to lower rates of inflation rather than participation in EMU per se, which did not have a structural impact on price developments. The authors saw a euro-linked structural break in the countries that had followed the Deutsche Bundesbank's monetary policy line prior to joining EMU only in the case of Luxembourg.

The results of Windberger and Zeileis (2011) indicate that Austria and other countries with low inflation before Stage Three of EMU benefited less

from the successful stabilization of price levels by the ECB than the erstwhile high-inflation countries did. As the OeNB was already widely independent before Stage Three of EMU⁴ – the central bank legislation provided for independence early on – participation in monetary union entailed only few additional credibility gains.

2 Foreign Trade

Traditional theoretical assumptions about the impact of a monetary union on foreign trade are that the volume of foreign trade will expand because transaction costs⁵ (exchange costs) decline and because uncertainty about the development of exchange rates is eliminated. Because relative prices change as a consequence of the cut in transaction costs within the euro area, trade between euro area countries should theoretically expand at the expense of trade with non-euro area countries.

Flam and Nordström (2006) point out that even a fairly small reduction of transaction costs can have a powerful effect on foreign trade. Based on Yi (2003), they argue that transaction costs have to be paid every time export goods cross borders, and because foreign trade is internationally fragmented, several borders have to be crossed. The effects of a reduction in transaction costs may be nonlinear, as lower trade costs may lead to a further fragmentation of foreign trade.

The “new goods” hypothesis first presented in Baldwin and Taglioni (2004) offers an alternative explanation of the foreign trade effects of a monetary union. The rise in foreign trade is not primarily explained as a rise in the

⁴ For information about the effects of EMU on the OeNB's independence, see Gnan et al. (2005).

⁵ The European Commission (1990) estimates the transaction costs at roughly half a percentage point of EU GDP as a whole.

trade of already traded goods (intensive margin), but rather by the expansion of foreign trade to new, previously locally traded products (extensive margin). The new goods hypothesis is based on the “new new trade” literature (Melitz, 2003), which allows heterogeneity of potential exporters and in which corporate productivity is an important determinant of foreign trade performance, so that only the most productive enterprises export.⁶

Baldwin and Taglioni (2004) use a theoretical model with market entry costs for exporters (compare Baldwin, 1998) and productivity differences between potential exporters to show that the less volatile exchange rates are and the lower trade barriers are, the higher the foreign trade volume is. As this model only provides for exports from companies above a certain threshold size, and the cut-off size varies with exchange rate volatility, a reduction of this volatility results not merely in higher exports per exporting company, but also causes more companies to export in the first place. Moreover, the effects of exchange rate volatility are not linear. Furthermore, lower transaction costs should entail a rise in foreign trade with all countries, though the effect is more pronounced for euro area countries.⁷ Consequently, the new goods hypothesis can also explain the rapid onset of euro effects on foreign trade, because no changes in production structures are needed to export existing products. The hypothesis is also compatible with the observation that euro effects materialized even be-

fore the introduction of euro notes and coins and the related reduction in transaction costs.

Numerous studies examine the effect of the euro on foreign trade, most of which rely on gravity models. This contribution discusses only a few representative studies and studies that explicitly present results for Austria. Rose (2000) is one of the first empirical studies about the trade effects of a monetary union. The result of this study is well known and has been cited widely, namely that a monetary union can result in an increase of up to 200% in trade flows. Rose (2000) provided the impetus for a sharp increase in research about the impact of a monetary union on foreign trade. Baldwin (2006a, 2006b) critically reviews Rose (2000) and other studies, citing the following reasons why only limited conclusions about the impact of the euro can be drawn from these studies: The monetary unions analyzed by Rose (2000) cannot be seen as representative of euro area countries. Baldwin (2006a, 2006b) in turn cautions that the analysis suffers from numerous econometric shortcomings, such as distortions due to the omission of variables, reverse causality (strong trade flows lead to a monetary union), and incorrect model specifications. Based on the literature he reviews, Baldwin (2006a) assumes a foreign trade effect of the euro of between 5% and 15%, citing 9% as the best estimate. Rose and Stanley (2005) conduct a meta-analysis of the impact of monetary union on foreign trade and, depending on the method used,

⁶ *These results are confirmed by microdata collected and evaluated within the framework of the EFIGE project (Navaretti et al., 2011). Within the scope of the EFIGE project, a total of 14,162 firms were surveyed, 492 of which were in Austria. The questions largely refer to 2008 figures. The results show that exporting firms in all countries surveyed are larger, more productive and more innovative and have higher-skilled labor than nonexporting firms.*

⁷ *An extension of the theoretical model to multiproduct firms can be found in Bernard et al. (2011); Bernard et al. (2007) contains a literature survey.*

they estimate the rise to come to between 8% and 23%. Another meta-analysis (Havránek, 2010) does not rule out that the euro has hardly any effects, and that the positive results in the literature are the result of a publication bias.

Micco et al. (2003) and Faruquee (2004) contain results for Austria, but these scientific studies only cover the first years of EMU's operation. Micco et al. (2003) use IMF data from 1992 to 2002 and examine the impact of monetary union on foreign trade as a whole, i.e. exports and imports. For Austria, they calculate an intra-EU trade effect resulting from the introduction of the euro of 13.7%; the EU average is 12.6%. The strongest effect is in Spain (21.7%), the weakest in Greece (−2.4%). Micco et al. (2003) estimate the rise in Austrian trade with non-EU countries to expand by 8.8%. Hence, the euro effect in Austria is slightly above the EU average of 8.6%. Micco et al. (2003) calculate the highest rise in trade with non-EU countries for the Netherlands (21.7%) and the sharpest decline for Portugal (−3%). Faruquee (2004) comes to similar conclusions: He calculates a rise in intra-EU trade of 14.8% for Austria (EU average 14.4%), with the bandwidth ranging from 5.1% for Portugal to 20.9% for Spain. In extra-EU trade, Austria, with trade gains of 6%, is below the EU average of 8%. As in the study of Micco et al., Faruquee (2004) measured the strongest effects for the Netherlands (19.3%) and the smallest trade gains for Finland (2.1%).

Baldwin and Di Nino (2006) empirically examined the new goods hypothesis established in Baldwin and

Taglioni (2004). In their empirical strategy, Baldwin and Di Nino (2006) take into account that the export and import data are censored, as only firms with a sufficiently low marginal cost find it profitable to export. The authors do not have access to the data required by the theory (bilateral trade data at the product level for individual firms),⁸ so they use trade data from the Comtrade database (six-digit export data) for the period from 1994 to 2003. Tobit estimations quantify the overall impact of the euro on Austrian foreign trade at roughly 6%; the euro area average comes to about 4%, and the highest value was found for Spain (11%). Baldwin and Di Nino (2006) do not see any significant impact of the euro on external trade in the case of about half of the euro area countries. The rise in Austrian foreign trade according to Baldwin and Di Nino's results is the consequence both of a higher trade volume of firms that were active in foreign trade even before EMU, and of additional foreign trade in new product groups.

Based on a theoretical model drawn up by Casella (1996), Badinger and Breuss (2009) examine whether country size is relevant for the impact of the euro on foreign trade. They assume that the size of a country's own market is a key determinant of competitiveness. The decline in transaction costs and in exchange rate risk resulting from monetary union is tantamount to an increase in the "home market," which was relatively more pronounced for small countries. Moreover, it must be assumed that the euro area is not a fully integrated market (there are e.g. legal differences as well as cultural and language barriers between countries), oth-

⁸ Only few studies use firm-level microdata (e.g. Berthou and Fontagné, 2008; De Nardis et al., 2008; Esteve-Pérez et al., 2011), and these studies limited themselves to individual euro area countries. No such study is available for Austria.

erwise there would not be a difference between large and small countries in the degree of market expansion. As Badinger and Breuss (2009) consider the euro effects a result of the reduction of transaction costs, they espouse the traditional view and do not aspire to conduct a comprehensive analysis of the impact of EMU on foreign trade. Badinger and Breuss (2009) use a gravity model and compare a time period prior to the beginning of Stage Three of EMU (1994 to 1998) with a later period (2001 to 2005). Moreover, to take into account the importance of rising economies of scale in the model of Casella (1996) and to mitigate possible endogeneity problems, they also perform an analysis with sectoral data. The authors show that EMU raised small countries' foreign trade by 3% to 9% more than that of large countries, with the difference also depending on how large the size discrepancy between the countries is. This result is fairly robust over all estimates. The findings of Badinger and Breuss (2009) do not relate to Austria as such; much rather, the authors examine Austria by comparison to other countries, viewing Austria as small compared to Germany, Spain, France, Italy and the Netherlands and as large only by comparison to Ireland.

Its growing international importance has increasingly made the euro an invoicing currency even outside the euro area, which, according to Breuss (2009), greatly helped to facilitate trade with countries outside the euro area. Breuss (2009) sees a positive impact for Austrian foreign trade also in the elimination of the soft currency countries' option to devalue their currencies.

The euro could also have an impact on tourism through the same transmission channels as in the case of foreign trade. Gil-Pareja et al. (2007) analyzes

this proposition using a panel data set of 20 OECD member countries for the period from 1995 to 2002. The authors conclude that the euro has led to an increase in tourism flows within the euro area and estimate the increase to come to about 6% for the euro area as a whole, with Greece posting the strongest expansion (around 25%) and the Austrian rise (6%) corresponding to the euro area average.

To sum it up, the calculated quantitative effects of the euro on foreign trade diverge strongly among the different studies. Apart from the problems discussed in Baldwin (2006a, 2006b), economic theory suggests that the impact of the euro on foreign trade differs by sector and even between different individual firms. Therefore, it would be desirable to use to a greater extent appropriately disaggregated microdata in studies on the impact of the euro on foreign trade (Baldwin et al., 2008).

All studies of this type are faced with the problem that the time series are quite short. Therefore, it cannot be ruled out that the effects of the euro on foreign trade have not fully unfolded yet, as suggested in Glick and Rose (2002). The authors use data from 1948 to 1997 to show that it can take more than 30 years for the impact of a monetary union on foreign trade to take full effect. Baldwin et al. (2008) point out that the effects of the euro on foreign trade may still increase if euro-related projects such as the Single Euro Payments Area are fully implemented, thus facilitating cross-border payments.

3 Economic Growth and Employment

A common currency may have a positive influence on economic growth and employment through other channels, apart from its indirect effects of greater price stability and stepped-up foreign

trade (European Commission, 1990; Barrell et al., 2008; Boltho and Eichengreen, 2008). A decline in real interest rates and in capital costs resulting from the elimination of exchange rate fluctuations and the decrease in uncertainty may lead to a rise in investment and stronger inflows of foreign direct investment. Enhanced price transparency through the use of a single means of payment may reinforce competition and in its wake the efficiency and effects of the Single Market. Additionally, a monetary union may strengthen financial market integration and thus contribute to more efficient international allocation of capital.

While numerous academic studies examine the effects of the single currency on foreign trade, only very few studies look into the impact of EMU on economic growth. One reason for this may be that growth effects are harder to estimate on the basis of the short time series available than trade effects.

Compared to the U.S.A. or to non-euro area EU countries, euro area economic growth has been low since the start of Stage Three of EMU. However, this development cannot be ascribed to monetary union. Much rather, it results from a wide variety of other factors, such as a combination of external shocks (e.g. commodity price developments) and tepid domestic demand during the first five years of EMU's existence (European Commission, 2004), positive country-specific developments outside the euro area (Wyplosz, 2006), and weak labor productivity growth (OECD, 2007).

Barrell et al. (2008) provides an analysis of the impact of the single currency on economic growth and em-

ployment covering the entire euro area. The authors use panel econometric methods as well as cointegration analysis in their study, and they examine not only the euro area, but also use Denmark, Sweden, the U.K. and the U.S.A. as a control group. Barrell et al. (2008) use hourly labor input adjusted by the skill level to analyze the direct impacts of monetary union on the development of employment. However, their research covers only the period up to 2004, as they use the EU KLEMS Database⁹ for data on skill levels. Barrell et al. (2008) find EMU to have had positive effects on economic growth, most pronouncedly in the core countries (Belgium, France, Germany and the Netherlands). In the long term, according to Barrell et al. (2008), euro area membership can entail a GDP increase of around 2%. However, the authors find no statistically significant influence of EMU on economic growth in the euro area countries outside the core group cited above – such as Austria.

Barrell et al. (2008) also deal with the question of whether EMU had indirect effects on economic developments in euro area countries. In this connection, they analyzed the volatility of output and of real exchange rates and examined whether a reduction of volatility leads to higher growth by a rise in capital stock and hence on output. Using econometric estimates for the period from 1984 to 2006, Barrell et al. (2008) establish that EMU has led to a reduction of the volatility of output and of the real exchange rate in most euro area countries. However, apart from the Netherlands, Austria is the only country in which Barrell et al.

⁹ The aim of the EU KLEMS project was to establish a database with information on economic growth, productivity, job creation, capital formation and technological change for all EU Member States. O'Mahony and Timmer (2009) provide an overview.

(2008) find output volatility to have risen. But the decline in exchange rate volatility was also relatively small in Austria, coming to about half of the euro area average. This may be linked to the fact that before EMU, the Austrian schilling was pegged to the Deutsche mark so that its exchange rate against the Deutsche mark fluctuated very little. As a result, the output effects of EMU on Austria through this channel were low. Barrell et al. (2008) comes to the conclusion that it is not possible to unequivocally determine whether EMU had positive effects for small countries such as Austria or Finland.

Breuss (2009) finds that almost all economic indicators in Austria performed better than the euro area and the EU-15 averages in the period from 1999 through 2008. Real wages per employee and employment growth posted below-average growth. Breuss (2009) and Breuss (2010) perform model simulations of overall economic impacts to estimate the effects of the euro. Whereas Breuss (2009) uses the Oxford Economic Forecasting world macro model to estimate the impact of EMU during the period from 1999 to 2008, Breuss (2010) develops an integration model that allows for separation of the impacts of EMU from the effects of other integration steps, such as EU membership, and that calculates the effect of EMU on Austria from 1999 to 2010.

Both studies arrive at similar conclusions. Fiscal consolidation (reduced crowding-out of private investment, positive contributions to capital formation), fixed exchange rates and a rise in productivity had positive impacts on economic growth. Overall, the simulations showed that EMU led to an average increase in economic growth of 0.3 percentage points (Breuss, 2009) or

of 0.4 percentage points (Breuss, 2010) a year. Roughly $\frac{1}{10}$ percentage points resulted from fiscal consolidation. Having fixed its exchange rate, Austria could no longer revalue its currency, which had a positive impact on Austrian competitiveness, but, according to both studies of Breuss only little impact on GDP. In Breuss (2010), the integration model shows that EMU entailed a rise in R&D spending, indirectly exerting an influence on total factor productivity. Breuss (2010) sees the effect on economic growth at 0.4 percentage points a year. In Breuss (2009), stronger growth of total factor productivity in the wake of EMU results in an average GDP boost of 0.27 percentage points a year. Thus, monetary union takes effect on economic growth mainly through its impact on productivity. Breuss (2010) also finds that participation in EMU and the introduction of the euro created some 10,000 new jobs every year. Calculations using the integration model signal that EMU pared an average of 0.3 percentage points from the unemployment rate. Breuss (2009) and Breuss (2010) cite the ECB's monetary policy as being at the heart of the dampening effect of EMU: It may have been too restrictive for Austria, as it was conceived for the euro area as a whole. Evidence of this conclusion is that the average real interest rate in Austria has been 0.4 percentage points higher than the euro area average since EMU's foundation. However, Breuss (2009) also notes that the development of long-term interest rates is consistent with a strengthening of economic growth and the dampening of inflation in Austria.

Participation in EMU has also changed the Austrian economy's reaction to shocks. Breuss and Rabitsch (2009) as well as Breuss and Fornero (2009) examine this conclusion. The

first of these studies finds that Austria reacts more strongly to demand shocks and shocks to total factor productivity than other euro area countries. Additionally, EMU reinforces the impact of economic developments in other countries on Austria's economy. Based on these results, Breuss and Fornero (2009) develop a dynamic stochastic general equilibrium (DSGE) model and use data for the period from 1984 to 2007 to perform an estimation using Bayesian methods on this model. The model assumes three countries with characteristics like Austria (a small, open economy), the euro area (a large economy, Austria's major trading partner), and the rest of the world, proxied by the U.S.A., to examine how nominal and real shocks are propagated and to study the welfare costs (measured as lost steady state consumption) of nominal rigidities. The findings of Breuss and Fornero (2009) show that EMU increases the efficiency of allocation in the euro area and that welfare losses caused by nominal rigidities have declined. However, Austria is the only country in which EMU causes welfare costs to go up.

4 Conclusions

Even though Breuss (2009) comes to the overall conclusion that the expected growth bonus of the euro has failed to materialize, EMU has proved its advantage in acting as a shield, as it were, against the drawbacks of globalization. The euro has contributed at least to dampening the price increase of commodities invoiced in U.S. dollars and has provided for more stability during periods of international financial crises.

Reviewing developments since the start of Stage Three of Economic and Monetary Union, nearly all macroeconomic indicators show that Austria's economy has performed better than the

euro area average (Breuss, 2009). The introduction of the euro has brought additional economic growth on the order of 0.4 percentage points a year for Austria (Breuss, 2010). EMU has had a positive impact on Austrian exports, and, as Badinger and Breuss (2009) show, EMU has enabled small countries (e.g. Austria) to achieve particularly high foreign trade gains. During the first years of EMU's operation, Austria posted low inflation rates. Austria did, however, feature a high degree of price stability even before the introduction of the euro, so that it benefited less from the positive effects of EMU on price level stability than the former high-inflation countries did.

The advantages for Austria of participating in a larger currency area were probably most pronounced in the spring of 2009 and in the summer of 2011: In spring 2009, Austria is likely to have benefited from the elimination of depreciation risk. It may be assumed that the perception of higher risk related to Austrian companies doing business in Central, Eastern and Southeastern Europe would have put the national currency under heavy devaluation pressure if it had not been for EMU. In the summer of 2011, Austria might have found itself in a position similar to that of Switzerland, had it not been for EMU, and massive appreciation would then have had a negative effect on the real economy.

An issue this contribution does not examine directly is the integration of financial markets as a result of the euro. EMU is likely to have contributed importantly to the integration of euro area financial markets (Lane, 2009). Stepped-up integration of financial markets may improve capital allocation efficiency and can broaden risk-sharing among euro area countries, thus mitigating the negative impact of heteroge-

neity in the euro area. However, in the light of the most recent crisis, the effects of capital market integration (such as the convergence of interest rates and lower financing costs for enterprises and sovereigns) are not to be seen as positive without qualifications.

The noneconomic impacts of the euro, such as the contribution of EMU

to greater European integration, were not part of this study, either, but may well be more important than the economic impacts. To secure the potential noneconomic and economic advantages of EMU and of the euro, it would appear to make eminent sense to learn the right lessons from the crisis for the architecture of the euro area.

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Annex

Overview of the Discussed Effects of EMU on Austria

	Rise in %		
Foreign trade	M 03	F 04	
Intra-EU	13.7	14.8	
Extra-EU	8.8	6.0	
Overall effect	B 06	G 07	
	5–6	6.0	
Economic growth and employment	B 08	B 09	B 10
Economic growth (percentage points p. a.)	0.0	0.3	0.4
Employment (persons p. a.)			9,800
Unemployment rate (percentage points)			–0.3

Source and notes: M 03: Micco et al. (2003), F 04: Faruquee (2004), B 06: Baldwin and Di Nino (2006), B 08: Barrell et al. (2008), G 07: Gil-Pareja et al. (2007), B 09: Breuss (2009), B 10: Breuss (2010). G 07 refers to tourism.