

25 years of EU Economic and Monetary Union in Austria: a macroeconomic assessment

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This article reviews the macroeconomic developments of 25 years living with the euro. At the time Austria adopted the euro, it had one of the highest GDP per head ratios in the euro area. Since then, it was able to maintain its above average position. This comes as a result of both GDP and population growth development being above the euro area average. During the last 25 years, except for the last two years, the inflation rate in Austria stood at 1.8% on average. This is in line with the price stability target of the European Central Bank (ECB) for the euro area. In this paper, we look at key macro variables of the Austrian economy and provide a comprehensive overview on empirical studies trying to assess the GDP and inflation effects of the Single European Market and the introduction of the euro on Austria. Most of these studies find significant, positive growth effects in the short term.

JEL classification: E6, F4, N13

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In this article, we look at how the Austrian economy has developed since the introduction of the euro and whether the Austrian economy has benefited from the introduction of the euro. Austria has been a member of the European Union (EU) since January 1, 1995.² At the time of Austria's accession, the EU had already gone far beyond mere economic cooperation. Originally conceived as a peace and reconstruction project after the Second World War, it developed into an institution standing for stability and democracy.³ With the irrevocable fixing of exchange rates, the euro was introduced as book money in 11 countries on January 1, 1999, marking the third stage of Economic and Monetary Union (EMU)⁴. Since then, nine more countries have adopted the euro (table 1). Hence, the euro is the official currency in 20 out of 27 EU countries. On January 1, 2002, the euro was introduced as cash.

The Treaty on the Functioning of the European Union and the Treaty on European Union established, among other things, the “four freedoms”: (1) The free movement of goods enables free exchange of goods within the European Union, (2) the free movement of services enables EU citizens to provide services freely across borders within the EU, (3) the free movement of persons enables EU citizens

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² In the literature survey of this article, we present several studies that discuss the economic advantages of joining the EU.

³ We recommend the EU's website for a comprehensive overview of its principles, aims and values, and for further information on the topic. Membership brings with it several advantages but also disadvantages. Points of criticism include losing national sovereignty, EU citizens having too little influence on the democratic processes in the EU, EU-wide regulations that are perceived as too tight and a disbalance between net contributors and net recipients.

⁴ For a list of all three stages and the corresponding integration steps, see *Economic and Monetary Union (EMU)* (europa.eu).

to live and work in any EU country and (4) the free movement of capital liberalized capital movements within the union.

The four freedoms should have positive implications on economic growth in the EU (see, e.g., Beer et al., 2017). Essentially, the advantages lie in the following:

- economies of scale: larger economic area, no tariffs or other trade barriers, lower transport, information and transaction costs
- efficiency effects
- productivity gains: more competition, comparative cost advantages
- allocation effects: such as direct investment and labor mobility

Many of these arguments also apply to a single currency area. According to the theory of the optimal currency area⁵, the advantages of a currency union lie in reduced transaction costs, increased efficiency and competition (as, e.g., prices are easier to compare) and reduced exchange rate risks and exchange rate volatility.⁶ These primarily microeconomic effects can also lead to a macroeconomic increase in foreign trade intensity, a more efficient allocation of resources (capital and labor) and an increase in technological progress.⁷ Based on these arguments, when a member-state-to-be is integrated into the EU and adopts the euro as national currency, its GDP growth rate could initially rise in the short term. This rise would weaken again over time but would still lead to a permanently higher GDP level. Also, EU integration and euro introduction could permanently change the long-run economic growth rate of the to-be member if the enlargement of its economic area during the integration process increases returns to scale in production.⁸

In this article, we focus on answering the following questions:

1. How has the Austrian economy developed in absolute and in relative terms (compared with other peer countries) over the last 25 years based on key macro variables?
2. Does Austria stand out in specific areas?
3. Has Austria benefited from its integration into EMU, especially from the introduction of the euro?

This article is divided into two main sections: The first two questions are addressed in the next section, where we present an overview of the macroeconomic development of the Austrian economy over the last 25 years, also compared to peer countries and the euro area. To answer the last question, we analyze how EU integration and especially euro introduction have affected growth and inflation in Austria by surveying different estimates found in the literature. The article closes with a short summary.

⁵ *The theory of optimal currency areas has long been discussed in economic literature and is based on the work of Mundell (1961), McKinnon (1963) and Kenen (1969). We recommend De Grauwe (2022) for a comprehensive overview.*

⁶ *The main disadvantage of the single currency is that member states are no longer autonomous in their monetary and exchange rate policies and have thus less leeway in their economic policy responses to asymmetric shocks. Nevertheless, the member states still have fiscal, wage and structural policy at their disposal for intervention. This has been discussed extensively in the literature. For a discussion of the interdependencies between monetary, fiscal and structural policy at the time the euro was introduced as book money, see Duisenberg (2002).*

⁷ *See also Beer (2011) and Brans et al. (2021) for a more detailed discussion of the topic.*

⁸ *See, e.g., Lucas (1988) on the positive external effects of human capital accumulation or Romer (1990) on endogenous technology.*

Table 1

Selected important developments since 1994

	Integration steps excluding euro introduction	EMU stages and euro introduction	Negative shocks	Recovery ¹ /recession in AT
1994		Stage 2 of EMU ²		Recovery 1994–2000
1995	Austria, Finland and Sweden become members of the EU; Austria signs Schengen Agreement	European Council agreed on naming the EU currency “euro” and that it will be introduced at the start of stage 3 of EMU		
1997/98	Abolition of border controls; Stability and Growth Pact (1997/1998)			
1999		Stage 3 of EMU		
2001		Greece introduces the euro		
2002		Euro as legal tender in the euro area (11 founding members and Greece)	Dot-com bubble	
2004	Estonia, Latvia, Lithuania, Poland, Czechia, Slovakia, Hungary, Slovenia, Malta and Cyprus become members of the EU			Recovery 2004–2007
2007	Bulgaria and Romania become members of the EU	Slovenia introduces the euro		
2008		Malta and Cyprus introduce the euro	Global Financial Crisis (GFC)	
2009		Slovakia introduces the euro	GFC	Strong recession
2010			Start of European sovereign debt crisis	Recovery 2010–2011
2011		Estonia introduces the euro		
2013	Croatia becomes member of the EU			
2014		Latvia introduces the euro		
2015		Lithuania introduces the euro		
2016				Recovery 2016–2018
2020			COVID-19 pandemic, the UK leaves the EU	Strong recession
2021			COVID-19 pandemic, supply restrictions, energy price shock	Recovery 2021–2022
2022			War in Ukraine, inflation shock	
2023		Croatia introduces the euro		Mild recession

Source: Authors' compilation.

¹ Recovery: GDP growth rates in Austria above average (1995–2023: 1.7%).

² 1994: establishment of the European Monetary Institute (EMI); 1998: establishment of the European Central Bank (ECB) and the European System of Central Banks (ESCB).

1 25 years of Austrian EMU membership – an empirical overview

In the last 25 years of history, Austria had 4 federal presidents, 12 federal governments, 9 federal chancellors, 6 Nobel Prize winners, 5 Oscar winners, 1 song contest winner, hosted the 2008 European Football Championship but never qualified for the Football World Cup. Coming to economically relevant numbers, in 1999, just under 8 million people lived in Austria. 25 years later in 2023, the 9 million mark was exceeded. Taking the average of 1999 to 2022, the population aged by over 4 years from an average of 38.6 years to 42.7 years. While the number

of children fell by almost 7%, over 40% more people over the age of 66 lived in the country in 2022 compared to 1999. The number of people in the working age of 15 to 65 years rose by 11% to over 6 million. Within this group, more people are working – the participation rate increased by over 5 percentage points. This is also reflected in a significant increase in employment (+27%), but we also observe a strong trend toward part-time work (Fritzer et al., 2023) associated with a sharp decline in the number of hours worked per head (–15%). In table A1 in the annex, we listed population growth in age cohorts, employment per head and in hours worked as well as the participation and unemployment rates for Austria and some peer countries.

The 25 years since the introduction of the euro have been characterized by various economic, political and pandemic shocks but also by positive events. Table 1 offers an overview of the most important developments. In the remainder of this section, we will focus on those events/crises that are related to the past 25 years since the introduction of the euro.

We will compare key macroeconomic indicators for Austria with those of five peer countries and the euro area aggregate. As one of the peer countries, we have chosen Germany because it is Austria's most important trading partner. Although the German economy is almost 10 times larger than the Austrian one, it is characterized by similar economic structures. Belgium and the Netherlands serve as peer countries as well, as those two euro area countries show a comparable population size and degree of economic openness. In this regard, we also look at two non-euro area countries, Sweden and Switzerland, due to similar population size and openness. All index charts shown are set to 100 in 1998 to show the development of the countries from the start of EMU in 1999 onwards.

In this chapter, we will focus on three key macroeconomic areas: (1) GDP (growth), labor productivity and sectoral structure, (2) inflation and (3) trade and competitiveness. In the next section, we look at what other authors have found on the effects of the EU and EMU on GDP and inflation.

1.1 GDP growth, labor productivity and sectoral change

After the introduction of the euro in 1999, the first years were characterized by constant and robust real GDP growth rates in the euro area, leading up to a boom phase in 2006–07 (chart 1). During this time, the Austrian economy benefited from the adoption of the euro, the increasing globalization and the integration of China in global value chains, the EU's Eastern enlargement in 2004 and 2007 and a phase of low interest rates after the dot-com bubble in early 2000. Except for Germany, all peer countries exhibited a similar growth story in the early 2000s. In 2007–08, the global financial crisis (GFC) hit banks in the USA and in Europe, spreading quickly to the entire financial markets all over the world. Although not involved in the US subprime market, the Austrian banks faced a confidence problem, which was intensified by their large engagement in countries in Central, Eastern and Southeastern Europe. In 2009, the GFC led to a recession in Austria and all peer countries. However, considerable fiscal and monetary policy interventions pushed the economies back on a growth path between 2010 and 2011 but led to the European sovereign debt crisis. Although not at the center of the crisis, Austria experienced a pronounced period of weakening growth between 2012 and 2015. While the Netherlands even faced a second recession, Belgium, Sweden, Switzerland

and, toward the end of this phase, also Germany recorded higher growth rates than Austria.

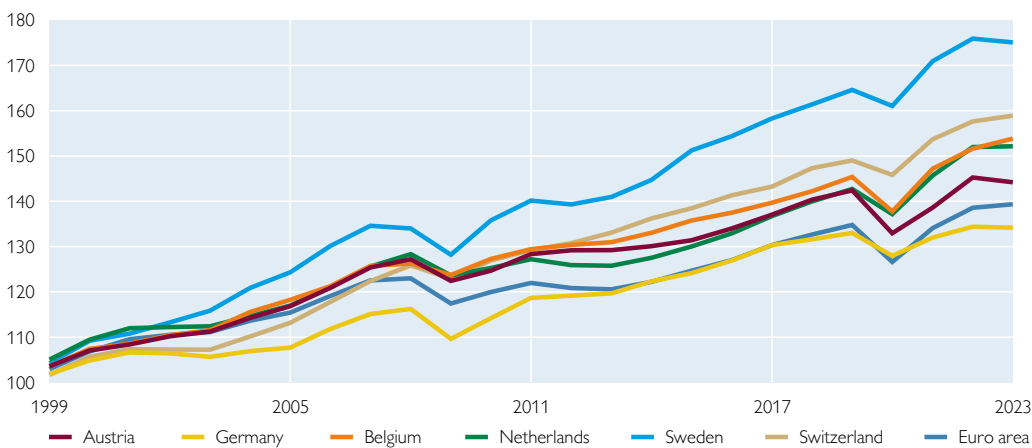
After 2015, the Austrian economy recorded a soft boom phase. However, already before the COVID-19 pandemic, growth slowed down in 2019 following the EU-US trade dispute, the Brexit and the German car industry crisis. In 2020, the COVID-19 pandemic induced a second deep recession, caused by several lockdowns and supply disruptions. Catch-up effects after the end of the pandemic led to extraordinary strong growth rates in 2021 and 2022. However, because of the energy price shock in the wake of the war in Ukraine, Austria recorded another recession in 2023.

In the period from 1999 to 2023, Austria recorded a cumulative real GDP increase of 44%, which is stronger than that of Germany (34%) and of the euro area average (38%). However, it was weaker compared to the increases in the

Chart 1

Real GDP

Index 1998 = 100

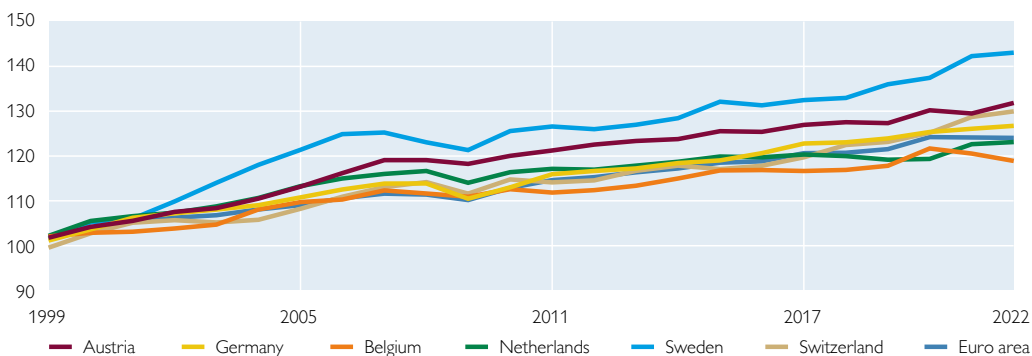


Source: Eurostat.

Chart 2

Productivity per hour

Index 1998 = 100



Source: OECD.

Netherlands (52%), in Belgium (53%), in Switzerland (59%) and in Sweden (75%) (chart 1). In terms of real GDP per head, the Austrian economy was the fifth richest country in the EU in 1999 (after Luxembourg, Ireland, Denmark and the Netherlands). For almost 25 years, Austria managed to maintain this position (chart A1 in the annex). By 2023, Sweden surpassed Austria making it now the sixth richest country in the EU.

As a second main economic indicator, we analyze the development of labor productivity, which is the relationship between production output and labor input. We present GDP as an index and measure labor input in hours, as the trend toward part-time work is particularly pronounced in Austria and distorts a per capita calculation.⁹ In chart 2, the two major recessions are barely visible because not only economic output declines in recession years but also the number of hours worked. Similar to the development of real GDP, productivity initially increased strongly but weakened considerably after the GFC in 2008–09. The decline in labor productivity growth is a widespread phenomenon and has already begun in the 1960s and 1970s (see, e.g., ECB, 2021 or Deutsche Bundesbank, 2021). A comparison with the peer countries shows that Austria, Sweden and Switzerland have developed more favorably than the EU average over the past 25 years. These fundamental developments are also emphasized by the Austrian Productivity Board (Productivity Report, 2023). The Productivity Board concluded that, since the GFC in 2008–09, labor and multifactor productivity have been growing more slowly than in the 1990s and 2000s. The decline has been caused by a slowdown in productivity growth within sectors and companies and not by shifting shares of value added between sectors/industries/companies, capital and technological progress.

In a next step, we focus in more detail on the supply side structure. Table 2 shows the sectoral decomposition of the Austrian economy and of the peer countries and its changes over the last 25 years. The Austrian economy has a broad-based production structure. The industrial sector is a key pillar and accounts for almost $\frac{1}{4}$ of Austrian value added. Only Germany (25.5%) and Switzerland (24.2%) have a similarly high share of industrial production. A special feature of the Austrian economy is its large share of the catering and accommodation sector. Although this sector has only a share of 4% of value added, its contribution is twice as large as it is in the peer countries. Both the industry and the tourism sector are strongly export-oriented, thereby leading to a high external exposure of the Austrian economy. Since slightly more than half of Austrian goods and around 60% of Austrian services are exported to euro area countries, the Austrian economy has benefited above average from the introduction of the euro and lower currency fluctuations compared to other euro area countries.

On the other hand, Austria has a smaller private services sector compared to the peer countries. Its share of value added amounted to 19% in 2022 (sum of “information and communication”, “financial and insurance activities” and “scientific and technical activities” in table 2), while the average of the peer countries was 26%. The public services sector in Austria also contributes less to value added (17.2%; peers: 19.5%).

⁹ The per capita figure is also distorted in the years of recession, as policy-measures such as short-time working schemes were implemented to maintain employment in companies to prevent a large-scale increase in unemployment.

Table 2

Supply side structure of Austria and peer countries: sectoral shares in 2022 and sectoral real growth 1999–2022

	Austria		Germany		Belgium		Netherlands		Sweden		Switzerland	
	Share ¹	Growth ²	Share	Growth	Share	Growth	Share	Growth	Share	Growth	Share	Growth
	%											
Total		46.7		35.8		52.5		55.1		76.9		57.6
Agriculture, forestry and fishing	1.3	26.9	0.7	11.5	0.5	3.2	1.7	33.4	1.4	47.8	0.6	2.3
Industry (except construction)	24.2	71.7	25.5	45.0	15.4	22.6	15.7	37.3	18.7	58.7	24.2	83.2
Construction	5.6	-15.3	4.0	-22.4	4.9	67.2	4.9	35.8	6.0	66.3	4.6	14.2
Trade and transport	17.0	28.7	14.3	48.5	16.7	31.8	19.0	76.8	16.1	92.1	15.6	43.7
Accommodation and food service activities	3.8	5.9	1.3	-11.3	1.6	10.0	1.9	8.7	1.5	4.2	1.5	-21.5
Arts and recreation	2.6	17.2	3.5	-2.1	2.1	32.4	2.2	20.2	2.6	33.7	2.9	73.5
Real estate activities	9.4	43.8	10.6	38.0	9.7	86.6	6.5	61.2	8.4	45.0	6.6	9.3
Information and communication	4.2	120.3	5.9	198.4	5.1	226.4	5.6	218.7	10.0	426.3	4.7	99.0
Financial and insurance activities	4.7	104.7	4.3	-22.8	5.8	9.6	6.9	24.6	5.1	116.7	10.7	86.4
Scientific and technical activities	10.1	128.7	11.8	46.8	16.8	132.3	15.2	67.7	12.1	165.1	10.0	47.4
Public sector	17.2	30.0	18.3	30.2	21.5	40.3	20.1	48.4	18.6	14.4	19.0	63.0

Source: Eurostat.

¹ Sectoral share in total value added in 2022.

² Cumulative sectoral growth in value added 1999–2022.

Note: Trade and transport (NACE G–H): wholesale and retail trade; transport. Arts and recreation (NACE R–U): arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies. Scientific and technical activities (NACE M–N): professional, scientific and technical activities; administrative and support service activities. Public sector (NACE O–Q): public administration; defense; education, human health and social work activities.

In terms of cumulated growth, Austria has recorded broad-based and high growth in the private services sector (of over 100%) over the last 25 years, which exceeds growth in industry (72%). The highest growth rates of almost 150% were recorded for the catering and accommodation sector. Only the construction sector shrunk over the last 25 years. A similar trend can be seen in Germany but not in the other countries.

1.2 Inflation

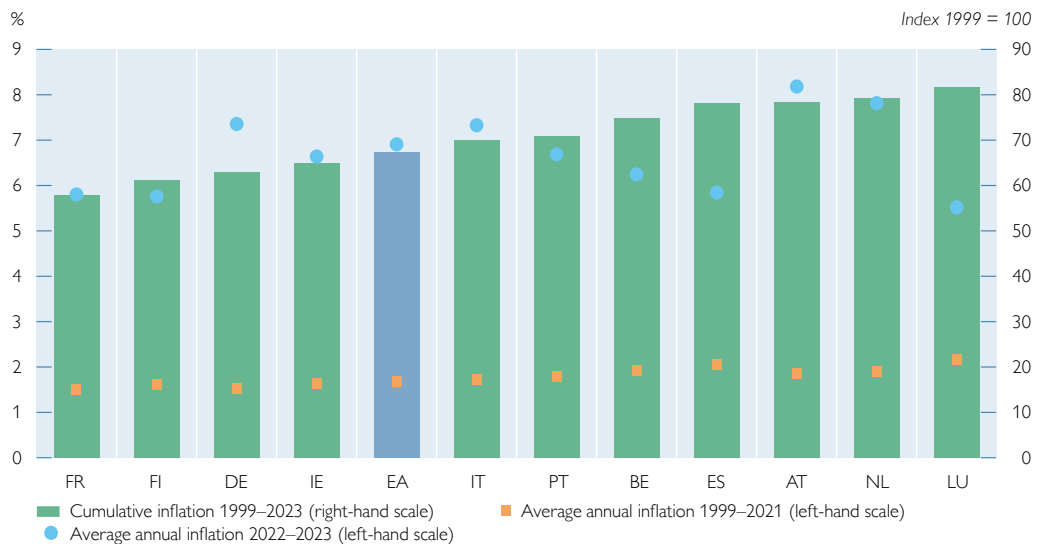
The primary objective of the Eurosystem is to maintain price stability, whose definition changed over time:

- 1999–2003: Price stability is defined as a year-on-year increase in the Harmonized Index of Consumer Prices (HICP) for the euro area in the medium run of below 2%.
- 2003–2021: ... below but close to 2%.
- 2021–now: ... 2%.

Did the Eurosystem accomplish its target? Looking at inflation in the euro area over the last 25 years, we can say yes – leaving aside its development around the GFC, the sovereign debt crisis and recent price increases. The European Central Bank (ECB) accomplished this target by using traditional monetary policy instruments as well as unconventional monetary policy when the key interest rates had faced the effective lower bound. Price stability in the euro area is mirrored by price stability in its member states. In the following, we present the inflation developments of the euro area in changing composition and of each of the 11 founding

Chart 3

Inflation 1999–2023



Source: Eurostat.

Note: EA = euro area.

member states of the euro area¹⁰. The euro area aggregate shows an average HICP inflation rate of 1.7% between 1999 and 2021. In the founding countries, HICP inflation lay between 1.5% and 2.0% (Austria: 1.8%). At this time, the only Western euro area country with an above average inflation (2.2%) was Luxembourg.

In the last two years, inflation rose worldwide as a result of two unexpected crises. First, the COVID-19 pandemic led to distortions in global supply chains and shifts in the demand structure causing increases in inflation already in 2021–22. Second, the energy price shock following the Russian war in Ukraine led to a massive rise in energy prices 2022–23 when inflation rates had already been high. All in all, these two events led to the biggest inflation shock since the oil crises of the 1970s.

At the beginning of the inflation shock in 2022, Austria recorded lower inflation rates than the euro area, but mid-2022, the Austrian HICP inflation rate surpassed the aggregated euro area rate and has stayed well above since. This differential can be traced back to three key factors in Austria: (1) the fiscal policy mix, meaning less direct price intervention and higher transfer payments, (2) the delayed transmission of global energy prices to end users and (3) higher inflation in the services sector due to stronger wage growth and the sharply increased prices in the tourism sector (Url and Vondra, 2023). This kept inflation rates in Austria high in 2023, placing it as the Western euro area country with the highest recorded inflation rate.

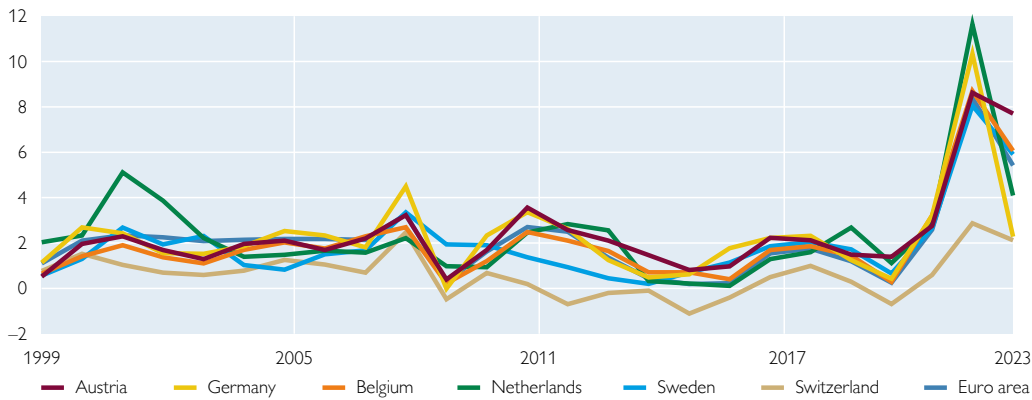
Chart 4 shows the annual inflation rates of Austria and its peer countries for the period 1999 to 2023. Their HICP rates developed rather similar with the remarkable exception of Switzerland. Chart 5 depicts the cumulative inflation rates calculated vis-à-vis the cumulative euro area inflation. If a country's line runs below

¹⁰ Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain.

Chart 4

Inflation

Change to previous year in %

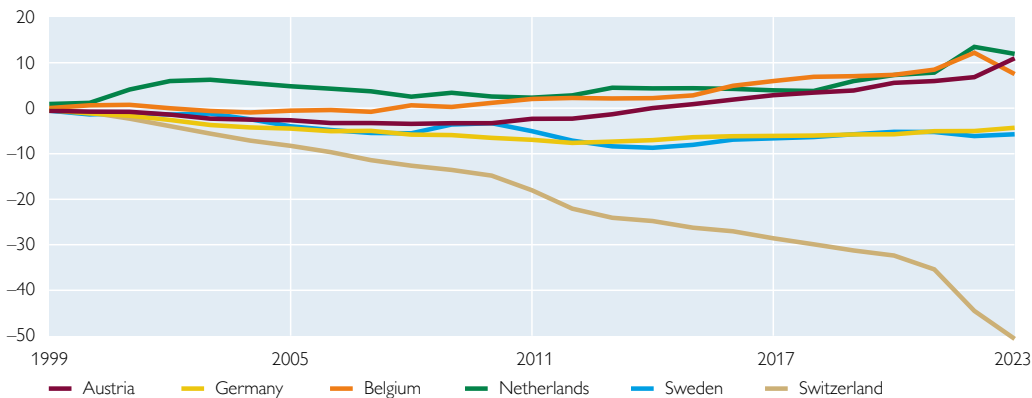


Source: Eurostat; Switzerland: Swiss Federal Statistical Office.

Chart 5

Inflation

Cumulative difference to cumulative euro area inflation in percentage points



Source: Eurostat; Switzerland: Swiss Federal Statistical Office.

the zero-line (vertical axis), its cumulative inflation since 1999 was below the euro area in the corresponding year (horizontal axis). For Austria, we observe that until the global financial crisis, inflation was below the euro area average. After that, inflation rose. This trend – as explained above – intensified in the last two years. Chart 5 also shows the substantially lower inflation rate in Switzerland over the whole horizon, going hand in hand with a steep appreciation of the Swiss Franc. While in 1999 CHF 1 was worth EUR 0.62, in 2023, it was worth EUR 1.03 – a nominal appreciation of 66%.¹¹

1.3 Trade and competitiveness

To finish this descriptive section, we will look at four key measures regarding foreign trade and competitiveness. Chart 6 shows the sum of exports and imports

¹¹ As shown in chart 7, the real effective exchange rate for Switzerland also appreciated but “only” by 10%.

as a share of GDP, indicating how interconnected an economy is with the rest of the world. Over the past 25 years, this “openness indicator” increased from 75% to 125% for Austria. This increase was driven by the general trend in globalization, the EU’s Eastern enlargement in 2004 and 2007 and Austria’s integration process into the EU, as shown in the next section. After the GFC, this globalization trend came to an end. The spike in 2022 seen in chart 6 is a consequence of the energy import shock.

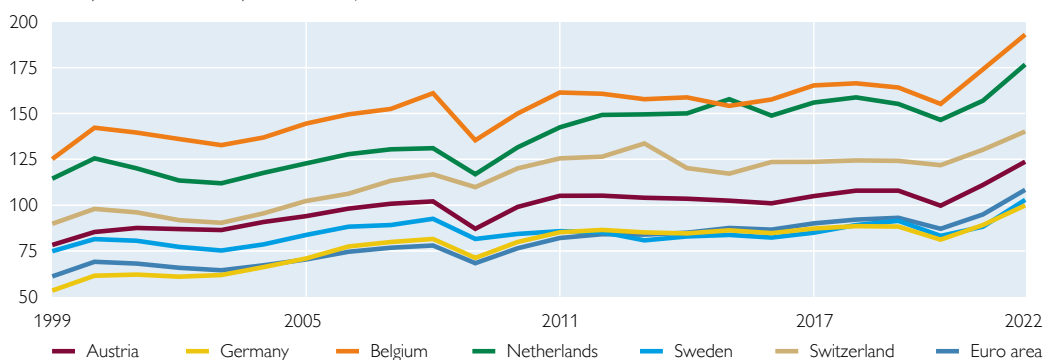
In a monetary policy union, nominal exchange rates are fixed. This implies that inflation differentials among member states trigger changes in the real exchange rate and in price competitiveness. Therefore, it is important to avoid such differentials within a monetary union. Measures of price competitiveness for Austria show a remarkably stable development. The real effective exchange rate, depreciated by the consumer price index (CPI), has remained almost constant over 25 years of EMU membership (chart 7).

Consequently, the current account – an indicator reflecting changes in price and nonprice competitiveness – shows a favorable development for the Austrian economy (chart 8). Starting with a small deficit, the balance turned positive in

Chart 6

Openness indicator

Nominal exports and nominal imports as share of nominal GDP in %

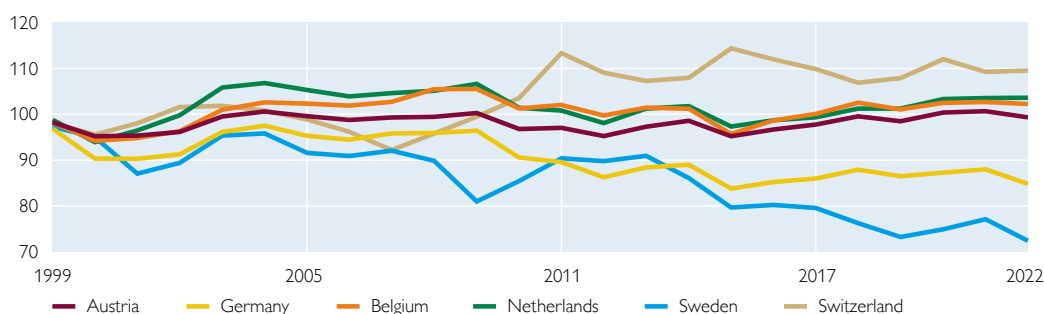


Source: Eurostat.

Chart 7

Real effective exchange rate

Index 1998 = 100



Source: World Bank.

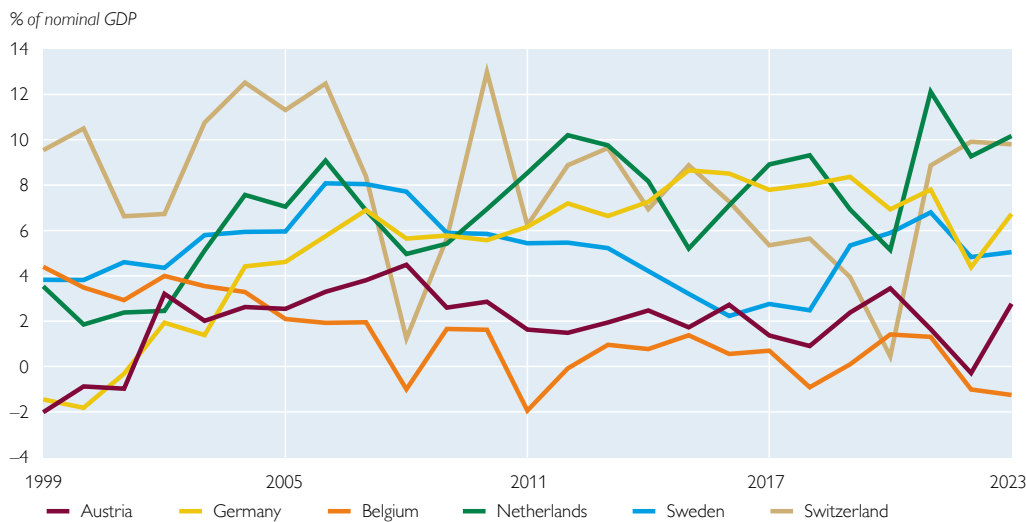
2002 and improved further until 2008. Since then, the balance slightly declined but stayed positive, fluctuating around 2% of GDP. Only in 2022, Austria recorded a small current account deficit, as the COVID-19 pandemic had severely dampened winter tourism and energy import prices had surged. Over the whole period under review, the constant surplus was mainly driven by strong contributions from services exports (mainly tourism), while the goods balance was broadly balanced.

Persistent current account surpluses contributed to a positive turn of the net international investment position in 2013; by the end of 2022, it stood at almost EUR 80 billion. Compared to most of the peer countries, the current account surplus of the Austrian economy is less pronounced but sustainable, as recorded by the European Commission (2022).

The development of the current account went hand in hand with only very modest losses in export market shares over the past 25 years (chart 9). These losses

Chart 8

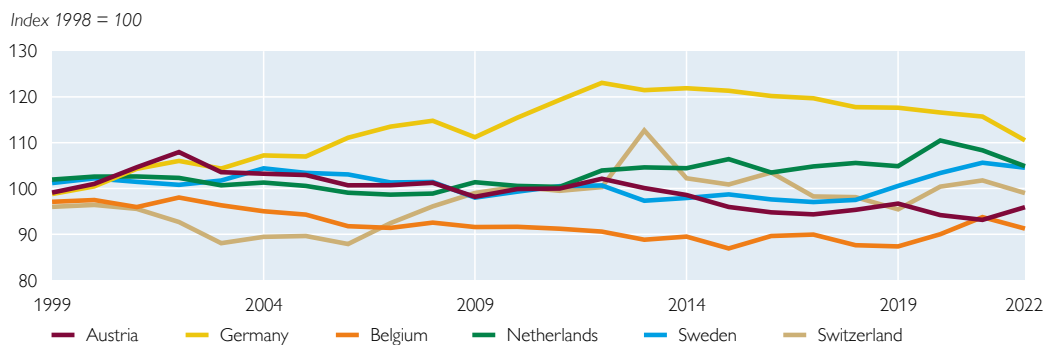
Current account balance



Source: OECD.

Chart 9

Market shares



Source: AMECO.

in market shares do not come as a surprise, since the Eastern European countries as well as Asian economies were catching up and became increasingly integrated into European and global value chains. Such catching-up processes naturally led to losses in market shares in the industrialized countries. All in all, the Austrian economy, and the external sector in particular, have developed successfully since being part of the EU, despite some very challenging years.

2 How did Austria's EU accession impact its economy – a literature overview¹²

2.1 Capturing macroeconomic effects of EU integration econometrically

Economic theory suggests that the individual steps toward European integration have had a positive impact on economic growth in Austria (see the introduction of this article and Breuss, 2023 for the latest discussion of the topic). As mentioned in section 1, when a country goes through the various integration steps, and thus introduces the euro, a) its GDP growth rates could initially rise in the short term, then weaken again over time but still lead to a permanently higher GDP level, or b) its economic growth rate could even change permanently in the long term. Also, some integration steps could make a country more robust against exogenous shocks, in particular against currency speculation. If Austria was not part of the euro area, an independent Austrian monetary policy would have to take into account the effects of Austrian monetary policy decisions on the Austrian exchange rate. In this case, keeping the exchange rate constant could, under certain circumstances, lead to high increases in interest rates, resulting in a slump in economic growth in Austria.

When analyzing the impact of Austria's integration into the EU on economic growth, one is confronted with two problems: First, the economic development in Austria was not only influenced by the integration steps but also by many other factors – above all by the strong exogenous shocks, such as the pandemic and the War in Ukraine, that hit Austria and the euro area as a whole in the last 25 years (table 1). Moreover, some of the shocks overlapped in time, making it especially difficult to clearly separate the effects of the European integration steps from those of exogenous shocks. An additional, complicating factor is the fall of the Iron Curtain in 1989. Though it had occurred before the period under review, its macroeconomic effects were felt years later. The second, even more fundamental problem is that analyzing the economic impact of the European integration steps on Austria can only be carried out in comparison with a hypothetical, alternative scenario, in which Austria did not go through the integration steps. For example, empirically observing GDP development after the implementation of an integration step does not lead to sound results of its effect, as GDP growth is also determined by a variety of other factors and shocks.

Possible alternative scenarios are, for example, that Austria did not become a member of the EU or EMU or that other EU member states did not undergo certain integration steps. However, the development that might have occurred in an alternative scenario cannot be observed in real terms and can thus only be

¹² Part of this section is a revised and thoroughly updated version of Beer et al. (2017), section 1.3. We recommend Beer (2011) and Badinger and Breuss (2011) for an overview of the results of older studies on this topic.

assumed. Studies that use different alternative scenarios therefore yield different results when estimating the integration effects. In addition, anticipation effects caused by the economic agents must be taken into account, as some integration steps can have effects on the economy already before their implementation (e.g., preparations for joining EMU). The studies presented below take many of these problems into account, albeit in different ways. The various approaches can be roughly divided into three groups sorted by the method adopted:

1. The synthetic control method, where a “control development”, i.e., an alternative scenario, is compared with the actual development.
2. Estimating equations with differently defined dummy variables to capture the effects of the various integration steps.
3. Synthetic time series depicting the integration intensity¹³ as explanatory variables that are intended to represent the integration steps.

How complex the econometric instruments used are also differs considerably, from very simple econometric models and standard macro models to new quantitative trade models and dynamic stochastic general equilibrium (DSGE) models. This article focuses on empirical studies from the last ten years; thus, their number is comparatively small. In addition, these studies are often limited to the period before the GFC.

2.2 The effects of all EU integration steps excluding euro introduction

In this section, we focus on the effects of the integration steps on economic growth and, in some cases, inflation in Austria. Table 3 provides an overview of the most important results of the studies that have been conducted on this topic over the last ten years. With the exception of one study (Oberhofer and Winner, 2015), which only analyzes the effects on foreign trade, the results of a total of 15 studies on GDP growth have been available since 2014, some of which analyze detailed results on the effects of various integration steps. Only five of these studies also show the effects on the inflation rate in addition to the effects on the GDP growth rate. The specific effects of the introduction of the euro are discussed in the next section.

In general, and this is the most important qualitative result of this literature review, all studies find positive effects of European integration on GDP growth. However, quantitative results vary greatly. For example, the overall effects of all integration steps range from cumulative +28.6% (Breuss, 2016) to +7.9% (Felbermayer et al., 2018). Different results arise, in part, from the fact that some studies also take into account the effects of integration steps from before 1995, while others do not. In addition, the strength of the effects also differ because many of the studies only examine partial aspects of the integration steps (e.g., only trade effects). However, there are also significant differences in the results for trade on GDP, for example, which vary between cumulative +15.6% (Oberhofer, 2019) and +3.9% (Mion and Ponattu, 2019). Here, the results vary because different methods and time periods have been used. Table 3 therefore shows not only the main results but also briefly the methods used, the integration steps and the periods analyzed. In the following, brief summaries of the studies are presented in chronological order.

¹³ Integration intensity is measured by an index which captures, e.g., different aspects of the Single Market freedoms, the adoption of EU legislation and to which extent the economic performance of a member state is different from the EU average.

Campos et al. (2014) use the synthetic control method to calculate how GDP per capita and labor productivity would have developed if a country had not joined the EU. EU accession had a positive impact on all countries under consideration with the exception of Greece. Austria's GDP was 7.2% higher in 2008 (end of the period under review) than it would have been without EU accession; this corresponds to an average increase in annual economic growth of 0.8 percentage points.

Table 3

Selected studies of the last 10 years about the economic impact of European integration on Austria excluding euro introduction

Study	Method applied	Integration measures	Time horizon	Real GDP ¹		Inflation	
				Growth differential (p.a.)	cumulative	p.a.	cumulative
				percentage points	%	percentage points	
Campos et al. (2014)	Synthetic control	EU accession of Austria	1995–2008	0.8	7.2	x	x
Berger et al. (2014)	Macro model	EU accession of Austria	1995–2013	0.6	13.0	x	x
Bertelsmann Stiftung (2014)	Abolition of border controls	Integration measured by change in index	1992–2012	x	24.9	x	x
Boockmann et al. (2015)	Synthetic control	EU accession of Austria	1995–2008	x	4.6	x	x
Oberhofer and Winner (2015)	Macro model	Different integration steps	1999–2014	Positive effect on net exports	x	x	x
Breuss (2016)	Macro model; comparison with hypothetical development	Fall of Iron Curtain	1989–2015	0.2	4.7	0.02	0.4
		EU accession of Austria	1995–2015	0.6	12.7	-0.25	-5.1
		EU enlargement 2004 and 2007	2004–2015	0.2	2.4	0	0.1
		Total	1989–2015	0.9	28.6	-0.17	-4.5
London Economics (2017)	Econometric model	Effect of EU integration measured by Single Market indicator	1990–2015	0.1	1.7	x	x
Felbermayr et al. (2018) ²	IFO trade/sectoral gravity model, "breakdown of agreements"	Single Market	"long run"	x	6.2	x	x
		Customs Union	"long run"	x	0.1	x	x
		Schengen Agreement	"long run"	x	1.2	x	x
		All	"long run"	x	7.9	x	x
Mayer et al. (2018)	Structural gravity model	Trade effects	"long run"	x	7.7–8.2	x	x
Mion and Ponattu (2019)	Gravity model, regions	European Single Market	2010–2016	x	3.9	x	x
in 't Veld (2019) ²	Quest DSGE model, counterfactual scenarios	European Single Market	"long run"	x	11.8	x	x

Source: Authors' compilation.

¹ Real GDP or real per capita GDP.

² The authors calculate the effects of undoing the various integration steps. To make the results in the table more comparable, the signs of the results are reversed.

Note: Concerning studies presenting total effects, the total effect does, in many cases, not equal the sum of the individual effects, since the individual integration effects overlap.

Table 3 continued

Selected studies of the last 10 years about the economic impact of European integration on Austria excluding euro introduction

Study	Method applied	Integration measures	Time horizon	Real GDP ¹		Inflation	
				Growth differential (p.a.)	cumulative	p.a.	cumulative
				percentage points	%	percentage points	
Oberhofer (2019)	Gravity model	Trade effects	1995–2014	0.7	15.6	–0.1	–2.4
Breuss (2019)	Synthetic control	EU and euro	1995–2020	1.0			
Breuss (2020a)	Macro integration model	Fall of Iron Curtain	1989–2020	0.1	2.4	0.01	0.2
		Euro area membership	1995–2020	0.4	10.9	0.01	0.2
		EU Enlargement	2004–2020	0.3	5.3	0.02	0.3
		Total integration effects	1995–2020	0.8	20.4	–0.07	–1.8
Breuss (2020b)	DSGE model	Trade barriers and markups	“long run”	0.4	10.3	–0.04	–1.0
		Trade barriers, markups and R&D	“long run”	0.7	17.8	–0.06	–1.6
Breuss (2022)	Small macro model	EU accession 1995	1995–2022	0.1	2.9	x	x
		EU enlargement 2004	2004–2022	0.3	4.8	x	x
		Trade effect	1995–2022	0.4	12.3	x	x
		Total	1995–2022	0.5	13.3	x	x

Source: Authors' compilation.

¹ Real GDP or real per capita GDP.

² The authors calculate the effects of undoing the various integration steps. To make the results in the table more comparable, the signs of the results are reversed.

Note: Concerning studies presenting total effects, the total effect does, in many cases, not equal the sum of the individual effects, since the individual integration effects overlap.

In a macroeconomic model, Berger et al. (2014) interpret the stronger increase in total factor productivity in Austria compared to Switzerland as an accession dividend. The estimate also includes the increased labor supply, which helped to overcome problems with the supply of skilled workers in the time horizon under consideration. Higher productivity and a larger labor supply led to additional investment incentives for companies, which in turn increased productivity. As a result of EU accession, annual real GDP growth rose by additionally 0.6 percentage points between 1995 and 2013.

The Bertelsmann Stiftung (2014) examines whether the EU member states have benefited from greater integration since the introduction of the Single Market in 1993. For this purpose, an index was formed that reflects the degree of integration of the member states. In the alternative scenario, European integration came to a standstill in 1992. The growth effects of European integration are estimated based on the correlation between the integration index and economic growth as well as the country-specific development of the integration index. The authors find that GDP per inhabitant has been higher in almost all countries considered than it would have been if European integration had not continued after 1992. Like in Campos et al. (2014), Greece was an exception. Austria benefited greatly from European integration in 2012, as its GDP level was 25% higher than it was in 1992, making Austria the fourth-highest growth country in the EU at that time.

Boockmann et al. (2015) use the ifo trade model and compare the actual economic development in Austria with hypothetical developments that would have resulted in the following three scenarios: a) Austria would have been like Switzerland (own currency, partial participation in the Single Market, no customs barriers); b) Austria would have been like the USA (EU trade agreements with third countries); and c) Austria would not have had any trade agreements. The results show that Austria's foreign trade would be worse off in any of these scenarios compared to the actual situation: Swiss scenario: exports -9% ; US scenario: exports -43% ; scenario without any trade agreements: -45% . The same applies to per capita income: Swiss scenario: -1.7% ; US scenario: -4.4% ; scenario without any trade agreements: -7.6% . Boockmann et al. (2015) point out that the losses in the scenarios represent a lower limit, as they only analyze the static effects of a better sectoral allocation. Dynamic effects (e.g., increase in factor productivity through innovations) are not taken into account. To shed light not only on static but also on dynamic effects, the authors also carry out an analysis using the synthetic control method. The results show that between 1995 and 2007, GDP per capita in Austria rose by an average of cumulatively 4.6% as a result of EU integration.

Oberhofer and Winner (2015) examine the effects of EU accession on Austrian trade in goods but not on economic growth. They consider both new trade relations, as a result of removing market entry barriers, and intensified existing trade relations (that, e.g., led to lower production costs and prices). The integration steps (EU accession, introduction of the euro, EU's Eastern enlargement) are taken into account by using dummy variables. The authors carry out a difference-in-differences estimation for 1988 to 2014. They show that EU accession increased exports to existing markets by around 10% , while exports to new markets did not increase significantly. The greatest export growth followed the Eastern enlargement beginning in 2004. The authors also show considerable positive effects on imports. Overall, the integration steps led to welfare gains for both consumers and producers in Austria.

Breuss (2016) uses a macro model to compare the actual economic development in Austria with a hypothetical development in which Austria has not taken any of the integration steps since 1989. According to the model, GDP growth in Austria increased annually due to the opening of Eastern Europe (1989) by 0.2 percentage points on average and due to EU accession (1995) by 0.6 percentage points. The EU enlargements of 2004 and 2007 added another 0.2 percentage points of annual economic growth. The integration steps overlap in time, which is why the individual effects cannot simply be added together. If all integration steps (including the implementation of monetary union) are considered, Austria's average annual increase in real economic growth amounted to 0.9 percentage points; the inflation rate was reduced by an average of 0.2 percentage points over the years. Breuss (2016) points out that the positive effects of integration for Austria have diminished over time. The positive effects of EU enlargement, on the other hand, were more stable. Even if increased integration did not lead to permanently higher GDP growth rates, the positive effects on the level of GDP remained. Overall, Austria's economic output has been around 29% higher since 1989 as a result of European integration than it would have been without integration.

London Economics (2017) bases its analysis on a self-generated integration index that takes into account a) various aspects of the Single Market freedoms, b) how the adoption of EU legislation impacted new member states and c) how much the

economic performance (e.g., relative productivity, relative level of per capita GDP) of individual member states differed from that of the EU. This index serves as an additional explanatory variable in a macro-economic model, and the author analyzes all European countries; the aggregate impact of the integration process on Austrian GDP amounted to 1.7% for the period from 1999 to 2015 or an average of 0.1 percentage points per year.

In contrast to other studies, Felbermayr et al. (2018) do not analyze the positive effects of each integration step but the negative effects in the event that the integration steps (customs union, Single European Market, euro, Schengen Area etc.) would have been reversed in the sense of “undoing Europe”. For this purpose, the authors use a sectoral gravity model with a disaggregated data set of 50 goods and services sectors.¹⁴ The results show that the impact on GDP growth has been greater for smaller countries and also for countries that have joined later. For Austria, GDP growth would have been 7.9% lower (base year 2014). The biggest part of this decline can be attributed to leaving the Single Market (6.2%).

Mayer et al. (2018) estimate trade stimulating effects stemming from different stages of European integration using a gravity model. The different integration steps analyzed are the free trade agreements, the Single Market, the Schengen Area and the introduction of the euro. Then they discuss the effects of counterfactual exercises (EU reaches regional trade agreements or reverts to WTO rules). The effects on Austria would also have been strong – real GDP growth would have been reduced by 7.7% to 8.2%.

Mion and Ponattu (2019) use a modern quantitative trade model of the global economy using trade data from the UN Comtrade database. They calculate counterfactual economic scenarios stemming from changes in trade costs related to the Single Market. Results show that the Single Market provided higher welfare to all its members, but countries and regions in the geographic center of the European continent gained more than some peripheral regions. This is also the case for Austria, where the Single Market led to a cumulative increase of GDP per head by 3.9%.

In’t Veld (2019) examines the impact of the Single Market in goods and services by simulating a counterfactual scenario in which tariffs and non-tariff barriers are reintroduced using a DSGE model. Similar to Felbermayr et al. (2018), he also analyzes an “undoing Europe” scenario.¹⁵ In this scenario, the intra-EU trade flows are significantly reduced, as are the market size and competition in the EU. The effects on Austria would have been strong – real GDP growth would have been reduced by 11.8%.

Oberhofer (2019) analyzes the impact of trade effects on Austria due to EU accession using a gravity model and data from the World Input-Output Database. The effects on Austrian GDP growth in the period 1995 to 2014 was strong. Cumulated GDP additionally grew by 15.6% in the period under review (0.7 percentage points per year). The effects on inflation (–2.4 percentage points) were also substantial.

In four different studies, Breuss (2019, 2020a, 2020b and 2022) comes up with qualitatively and quantitatively very similar results. This is remarkable because the

¹⁴ For a better comparison in table 3, we reversed the signs of the results there.

¹⁵ For a better comparison in table 3, we reversed the signs of the results there.

methods used differ greatly (“large” macro model, DSGE model, “small” macro model). Breuss (2019) uses the synthetic control method. According to him, EU membership led to an overall increase in GDP growth per capita of around 1 percentage point on average per year between 1995 and 2020. Of this, around 0.7 percentage points were attributable to EU membership and around 0.3 percentage points to the introduction of the euro. Breuss (2020a) uses a medium-sized macro-integration model to analyze the effects of many different integration steps on Austria for the period 1995 to 2020. He analyzes the effects of EU membership, of EMU, of the EU enlargement of 2004 and of 2007 and of the fall of the Iron Curtain in 1989. In total, the sum of all integration effects amounted to a cumulated increase of GDP growth of 20.4% between 1995 and 2020 or of 0.8 percentage points per year. EU membership led to an increase in GDP of 10.9% (0.4 percentage points per year). Even the EU enlargement of 2004 and of 2007 yielded a cumulated GDP effect of 5.3% (0.3 percentage points per year).

Breuss (2020b) uses a two-country DSGE model where – following Romer (1990) – total factor productivity is endogenized to capture developments of trend factor productivity (TFP) via research and development (R&D) investments and the productivity effects of globalization (exports and foreign direct investments). Additionally, the real exchange rate is derived from a risk sharing equation. Three different time periods are analyzed: (1) the Single Market, EMU and the EU enlargement since 2004. The author examines the effects of lifting trade barriers, of increased competition (“mark-up shock”) and of the investment-promoting effect caused by increased TFP. The lifting of trade barriers together with the increase in competition led to a cumulative increase in GDP of 10.3% or 0.4 percentage points per year between 1995 and 2020. If the effects of TFP (calculated via R&D investments) are also taken into account, the cumulative positive effects increased to 17.8% of GDP or 0.7 percentage points per year. Despite the endogenization of the TFP, the positive effects of the integration steps also slowly lessened over the course of time in this model.

Breuss (2022) uses a 10-equation EU model with dummy variables proxying for the different integration steps for the time period 1995 to 2022. Overall, the integration steps led to a cumulative increase in GDP of 13.3% or 0.5 percentage points per year. Here too, the trade effects were by far the strongest (cumulative: 12.3%, per year: 0.4 percentage points).

2.3 The effects of euro introduction

In contrast to the effects of Austria’s accession to the EU, most studies on the effects of the introduction of the euro in Austria find either only small positive or almost negligible growth effects on its economy. Additionally, with only seven studies, the number of studies analyzing the effects of EMU is quite small (table 4). For the analysis of the effects of the integration steps, the respective alternative scenarios are crucial to the results, as we have seen in the last subsection. This is also the case when analyzing the effects of euro introduction. Thus, the results of the individual studies cannot be compared directly with each other. For example, in the alternative scenario in Fernández and García Perea (2015), EMU would not have come about at all, while in Breuss (2016), EMU would have existed, but Austria would not have participated. Unless otherwise stated, the general methodical

Table 4

Selected studies of the last 10 years about the economic impact of euro introduction on Austria

Study	Method applied	Time horizon	Real GDP ¹		Inflation	
			Growth differential (p.a.)	cumulative	p.a.	cumulative
			percentage points	%	percentage points	
Fernández and García Perea (2015)	Synthetic control	Different time periods	No significant impact	No significant impact	x	x
Oberhofer and Winner (2015)	Macro model	1999–2014	Very small positive effect on net exports	x	x	x
Breuss (2016)	Macro model; comparison with hypothetical development	1999–2015	0.5	9.3	0.05	0.8
Felbermayr et al. (2018) ²	IFO trade/sectoral gravity model, “breakdown of agreements”	“long run”	x	0.7	x	x
Akhmadieva and Smith (2019)	Single equations, VAR, structural break	1999–2016	x	Difficult to draw strong conclusions	x	x
Breuss (2020a)	Macro integration model	1999–2020	0.1	2.3	0.0	0.2
Breuss (2022)	Small macro model	1999–2022	0.2	4.6	x	x

Source: Authors’ compilation.

¹ Real GDP or real per capita GDP.

² The authors calculate the effects of undoing the various integration steps. To make the results in the table more comparable, the signs of the results are reversed.

approaches of the studies did not differ from the respective methods used for the analysis of all other integration steps (see subsection 2.2 for details).

The results of Fernández and García Perea (2015), Oberhofer and Winner (2015) and Akhmadieva and Smith (2019) show that the introduction of the euro had impacted GDP growth, exports and/or inflation only weakly. Fernández and García Perea (2015) come to the conclusion that EMU’s impact on Austrian economic growth has been insignificant. In this context, they point out that EMU came about the time when China’s importance in trade began to increase sharply. This development further fragmented international trade and caused trade between the euro area countries to not grow significantly despite the introduction of the euro. In addition, the increasing importance of international production chains resulted in a complete reorganization of international trade. Oberhofer and Winner (2015) come to the conclusion that the introduction of the euro had hardly any additional trade effects on Austria. According to them, one possible reason might be that Austria benefited less from the single currency, as the Austrian schilling had already been pegged to the Deutsche mark for many years.

Akhmadieva and Smith (2019) use single equations and structural vector auto regressions with exogenous variables to test whether a structural break occurred due to the introduction of the euro. They compare countries that have adopted the euro with countries that have not and come to the conclusion that it is difficult to draw statistically significant conclusions.

Breuss (2016, 2020a and 2022) and Felbermayer et al. (2018) conclude that the introduction of the euro in Austria has influenced GDP growth positively. According to Felbermayer et al. (2018), the introduction of the euro affected Austrian GDP growth relatively weakly (cumulatively by +0.7%) compared to other integration steps (see the previous subsection). All three studies of Breuss show that EMU had positive effects on economic growth. Although these effects were smaller than the trade effects (see also the previous subsection), they still were significantly high compared to the results of the other studies under review: GDP growth amounted cumulatively to +9.3%, +2.3% and +4.6%, depending on the study and the period under review (table 4). Breuss (2016 and 2020a) also find slightly positive effects on inflation (cumulatively by +0.8 and +0.2 percentage points, respectively). According to Breuss (2020 and 2022), each individual integration step temporarily led to growth effects of varying strength, but these effects decreased and phased out over time.¹⁶

3 Summary and conclusion

Austria joined the EU in 1995 and adopted the euro as official currency in 1999. In the following years up to the global financial crisis in 2008, global trade integration had been deepening; Austria particularly benefited from the EU's Eastern enlargement in 2004 and 2007. However, the GFC, the COVID-19 pandemic and the Russian war against Ukraine led to (deep) recessions; the sovereign debt crisis and the Brexit were felt in the economic world as well. For a small open economy like the Austrian one, the euro as a common European currency served as a protective shield against these exogenous shocks and the uncertainty. For example, the euro contributed to reducing volatility in economic developments that can be triggered by strong currency fluctuations.

Since the introduction of the euro in 1999, the Austrian economy has managed to maintain its above-average GDP per capita position within the EU. Average labor productivity growth in the past 25 years was higher than in most peer countries but has fallen back slightly in recent years. The Austrian economy owes this robust development to a strong industrial sector, an above-average share of the tourism sector and a growing services sector. However, the energy price shock led to a strong rise in inflation in 2022 and 2023, which was well above the euro area average at the end of the period under review. In the 25 years since joining the EU, Austria's external sector has successfully maintained its international competitiveness. This is reflected in an increased degree of openness, a sustained positive current account balance, nearly constant market shares and remarkable stable price competitiveness. Economic output in Austria increased by 44% from 1999 to 2023.

We have summarized the results of a large number of studies that have estimated the additional growth effects due to the European integration steps for the Austrian economy. The vast majority of the studies under review paints a clearly positive picture. Many studies find that later integration steps had smaller positive effects on GDP growth, which is not surprising since these have been smaller in magnitude than earlier integration steps. Specific, quantitative assessments of the positive effects vary, however. The results of GDP growth in Austria range between 28.6%

¹⁶ We highly recommend Breuss (2020, p. 36 and 2022, pp. 115 and 116) for graphic representations of his results.

and 0% (high result: Breuss (2016), who includes the fall of the Iron Curtain; low result: Fernández and García Perea (2015), who examine the effects of the introduction of the euro). The effects of the introduction of the euro are considered to be weaker compared to other integration steps, but many studies still find significant positive growth effects for Austria ranging from 0.7% to 9.3%. The reason that results vary so greatly lies in the fact that different observation periods, integration definitions and methods to estimate growth effects have been used. According to the studies considered, the various integration steps initially had led to rising GDP growth rates, which weakened over time but still caused permanently higher GDP levels. Positive effects on the long-term growth rate of an economy were not found. Other potentially positive effects of the introduction of the euro, such as protection against currency speculation, are not analyzed in the cited studies.

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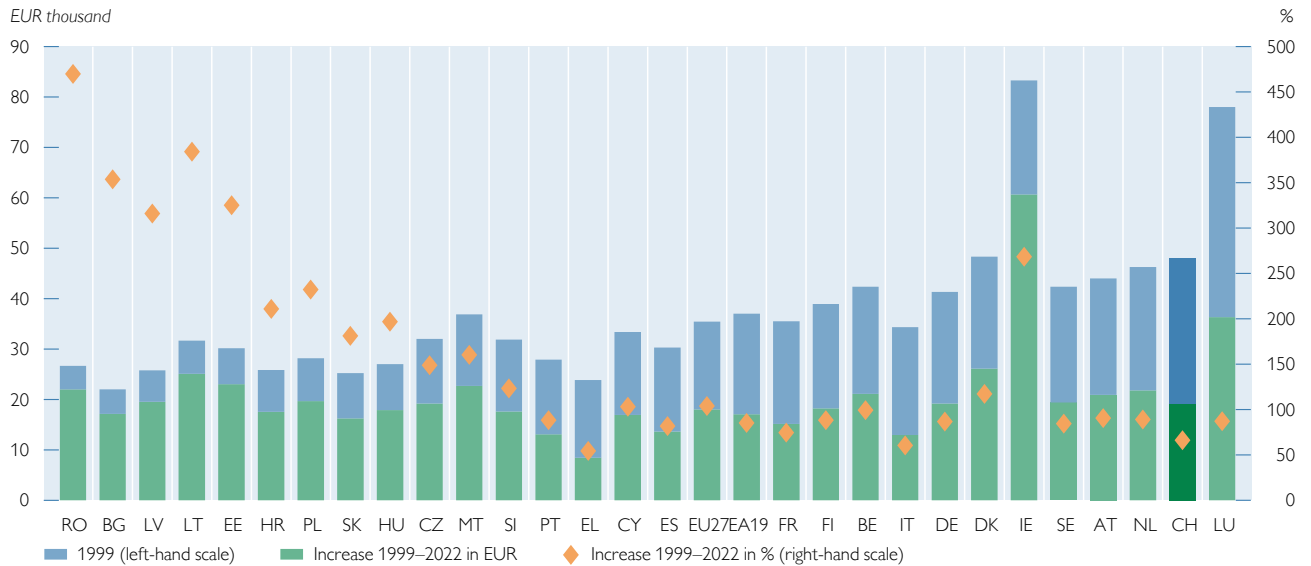
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Annex

Chart A1

GDP per head



Source: Eurostat.

Note: Switzerland: increase until 2020; GDP in purchasing power parities.

Table A1

Population and labor markets

	Austria	Germany	Belgium	Netherlands	Sweden	Switzerland	Euro area
2022 compared to 1999 in %							
Population							
0–14 years	–6.6	–10.6	7.0	–7.0	11.6	5.8	–4.8
15–65 years	11.2	–4.4	10.8	6.7	15.0	20.4	2.0
Older than 66 years	41.0	41.3	33.8	65.6	37.3	54.1	44.9
Total	12.5	1.5	13.7	11.6	18.0	22.7	7.3
Employment in heads	26.9	17.5	27.5	28.0	26.8	33.2	–
Hours per head	–15.3	–8.3	–0.2	–4.5	–4.3	–9.5	–
Employment in hours	2.9	9.4	27.4	20.9	22.0	13.3	–
2022 compared to 1999 in percentage points							
Participation rate	5.3	7.8	5.4	7.3	4.6	1.5	–
Unemployment rate (1999–2022) %							
Min	3.8	3.0	5.5	2.8	5.0	2.5	6.7
Max	6.5	10.5	8.7	8.4	8.8	5.1	12.1
Mean	5.3	6.2	7.5	5.5	7.3	4.2	9.2

Source: Eurostat, OECD.