

Austria's Manufacturing Competitiveness

Christian Ragacs,
Beate Resch,
Klaus Vondra¹

This study discusses Austria's manufacturing competitiveness and its influence on changes in the export market shares of domestic manufacturers. We first analyze price competitiveness over time and then conduct a constant-market-shares analysis in order to attribute changes in the export market shares of domestic manufacturers to their competitiveness on the one hand and international demand patterns on the other.

Austria's manufacturing industry seized the opportunity to expand to the east when the markets in Central, Eastern and Southeastern Europe (CESEE) opened up. Against this backdrop, domestic manufacturers were able to improve their price competitiveness between 1995 and 2004. They also gained export market shares from 2000 onward but lost some ground in 2005 and 2006. Since then, market shares and price competitiveness have remained broadly unchanged, which means that Austria has in fact done better than most other euro area countries. By historical comparison, the impact of the financial and economic crisis on Austrian manufacturers' export market shares and their competitiveness remained limited.

JEL classification: F14, L6

Keywords: international competitiveness, Austrian manufacturing, CMSA

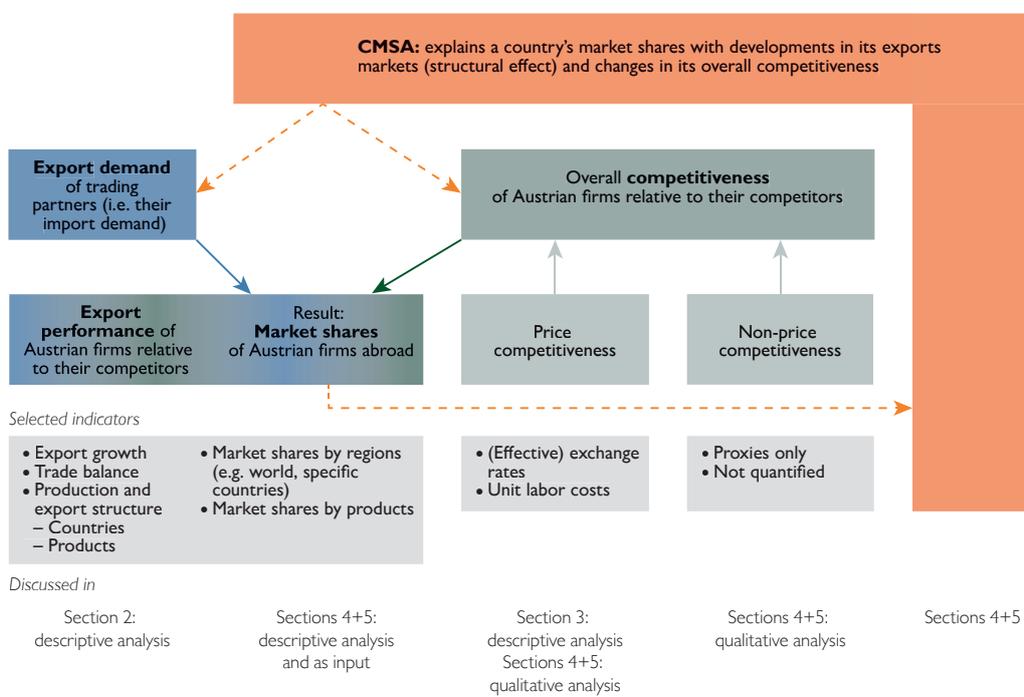
In the wake of the financial and economic crisis, Austria's manufacturing output shrank by almost 14% in 2009, while goods exports contracted by some 18% in real terms (quarterly national accounts data, seasonally and working day-adjusted; Q2 2011 flash estimate) as a result of an unprecedented slump in global trade. Prior to the crisis, the role of export demand had somewhat faded from the spotlight in the economic policy discourse, and the in part very high export growth rates of Austria had often been explained with its ability to sustain and enhance its international competitiveness. But export growth is driven by both competitiveness and international demand (chart 1), which is why an improvement in international competitiveness must go hand in hand with an increase in export market shares. This article discusses how Austria's manufacturing competitiveness has changed over time and what role it played for the gain or loss of export market shares.

Firms can improve their overall competitiveness (chart 1) either by undercutting competitors' prices for the same good (*price competitiveness*) or by developing products for which there are no direct competitors (*non-price competitiveness*). This study focuses on two main issues: The first is a descriptive analysis of the *price competitiveness* of Austrian manufacturers over time. Unlike non-price competitiveness, price competitiveness can be measured with numerous indicators, such as bilateral and effective exchange rates (deflated by various price and cost indicators, e.g. unit labor costs).² Given that an improvement or deterioration in price competitiveness does not necessarily cause changes in export market shares – as the degree of non-price competitiveness may be changing at the same time – our second main issue is an analysis of the *role* the *overall competitiveness* of Austrian manufacturers (chart 1) has played in shaping their export performance, using constant-market-shares analysis (CMSA).

¹ Oesterreichische Nationalbank, Economic Analysis Division, christian.ragacs@oenb.at, beate.resch@oenb.at, klaus.vondra@oenb.at. The authors thank Gerhard Fenz, Martin Schneider and Walpurga Köhler-Töglhofer for valuable discussions.

² See Siggel (2010) for an overview of the literature on competitiveness measurement.

Competitiveness, Market Shares and CMSA



In CMSA, losses and gains of market shares can be traced back to changes in overall competitiveness, among other things, but CMSA does not distinguish between price and non-price competitiveness. If price competitiveness moves in the same direction as overall competitiveness, it can be assumed to either help or hinder goods exports. If they move in opposite directions, non-price competitiveness can be assumed to play the dominant role for the development of overall competitiveness. The CMSA in this article covers 95% of Austria's goods exports. We also provide CMSA results for Austria's position in the euro area and the EU.

This study is structured as follows (see also chart 1): Since there is no uniform definition of international competitiveness, section 1 provides a brief overview of different competitiveness concepts and highlights the differ-

ences with traditional international trade theory. Section 2 gives a descriptive overview of developments in Austria's manufacturing industry, exports and export structure. Section 3 presents and discusses Austria's price competitiveness in international and historical comparison, by looking at common price competitiveness indicators and unit labor costs. Section 4 uses CMSA to establish the determinants of Austria's export performance. Changes in market shares can be traced back to developments in Austria's overall competitiveness on the one hand, and to structural changes in export demand (import demand by Austria's trading partners) on the other hand. Section 5 features a qualitative discussion of the relative role of price and non-price competitiveness in our CMSA results, and section 6 summarizes the main results.

1 What Is Competitiveness?

Traditional international trade theory focuses on cross-border trade *between countries* and assumes that *both sides* benefit from welfare gains as they utilize comparative advantages.³ Yet *at the firm level* the situation is such that trading partners gain or lose market shares in line with changing competitiveness patterns *at the cost* of their competitors. The “race for competitiveness” may, nonetheless, indirectly cause international product trade to produce welfare gains for all economies involved by inducing a rise in productivity and product quality⁴ – but this is not necessarily the case. At any rate, competitiveness is a *relative concept*, and it can be measured only in relation to others.

One of the most convincing classifications of competitiveness as defined in the literature was drawn up by the German Council of Economic Experts (2004). Following this classification, competitiveness can, first, only be reasonably discussed at *firm level*, as only firms can be forced off the market. An alternative approach is to widen the firm-level (or industry-level) focus to include *selected macroeconomic indicators*, such as effective exchange rates and price and wage developments, as the success of a firm or industry is linked to such external factors. Essentially, this approach concentrates on the “*ability to sell*” products in a competitive international environment. Ultimately, competitiveness can also be seen as a coun-

try's ability to succeed in international competition, as the competitiveness of individual firms is influenced by a country's overall structure, including e.g. infrastructure and education levels. From this perspective, a country's competitiveness would be equivalent to its ability to achieve the highest income possible in the long run – or the ability to excel by the standards of a wide range of other indicators, as used for instance in competitive analyses of the World Economic Forum and the Bertelsmann Foundation.

The distinction between price and non-price competitiveness (as outlined in the introduction) is entirely consistent with the first two types of definitions outlined above and partly consistent with the third. This article concentrates mainly on the second definition (“ability to sell”). We look at trade in goods only; cross-border production processes, foreign direct investment and the relocation of production processes are not explicitly considered.

The perspectives for analysis and the implications for economic policy vary depending on the competitiveness definition used. The third definition, for instance, would require us to examine the effects of competitiveness on domestic welfare, as an improvement in international competitiveness could well imply negative tradeoffs for a country's macroeconomic development. In this contribution, macroeconomic effects are addressed only indirectly in section 3 and box 1.

³ In theory, a convergence of productivity levels could eliminate comparative advantages and thus make international trade obsolete (Samuelson, 2004). This argument is controversial, though.

⁴ Remember, for instance, the discussion on the effects of a slightly overvalued Austrian schilling, which necessitated and promoted structural reforms.

Competitiveness and Macroeconomic Developments

Low wages and rising exports: Model theory suggests that a country can only achieve a long-run external equilibrium if its international competitiveness – and thus its share of global exports – remains unchanged and if this equilibrium is accompanied by an internal equilibrium. A long-run decline in competitiveness would lead to a negative goods balance and is therefore unsustainable. This fact is especially salient for open economies, and thus affects small countries like Austria more than it does others. This is why small open economies need to take extra care to prevent their competitive position from deteriorating in the long run. However, a steady rise in the current account surplus is unsustainable, too, as it is incompatible with a long-run external equilibrium. Still, in the short to medium term, competitiveness gains can contribute significantly to raising the domestic income level.¹ These favorable effects are not bound to occur, though: If price competitiveness gains are achieved not by raising productivity but only by cutting relative domestic factor costs – above all wages – the positive export-driven growth effects may be all but offset by the negative impact on domestic demand.

High wages and rising exports: In the short term, wage levels that are considered too high can also lead to an increase in export activity as industrial enterprises relocate labor-intensive production processes abroad to avoid the high labor costs (“bazaar economy effect” in Germany; Sinn, 2001). As a result of the increasing internationalization of production processes, export levels rise while the domestic share of value added declines. Therefore, an increase in export figures does not necessarily go hand in hand with a rise in domestic value added and employment, given the tradeoff between income levels and export performance. Sinn even coined the term “pathological export boom” to describe a situation in which Germany’s high export performance was achieved not despite but because of the country’s high wage level (Sinn, 2006). While Sinn’s hypotheses are controversial in the academic discussion, they highlight the fact that rising export growth is not necessarily indicative of higher competitiveness, and that the export (or import) of finished goods has lost ground to intra-industry trade across borders as the international division of labor expanded.

¹ However, recently another argument has also gained popularity, namely that members of a monetary union gain competitiveness at the expense of other, less competitive member countries.

2 Production and Export Structure of the Austrian Manufacturing Industry

Austria’s economic structure changed considerably in the wake of the major political changes of the past two decades – the fall of the Iron Curtain, Austria’s accession to the EU, the EU enlargement by CESEE countries, and the introduction of the single European currency. Located in a small open economy at the center of Europe, Austrian manufacturers were forced to constantly improve their competitiveness so as to remain competitive domestically and be able to expand

to neighboring markets that were opening up.⁵

These circumstances are reflected in a rising (goods and services) *export share in GDP*, which jumped from just under 34% in 1995 to almost 60% in 2007 (chart 2). In absolute terms, exports outpaced imports for the first time in 1997; Austria has posted a current account surplus since 2001. Exports have become a major driver of growth. At the same time, the country has become more dependent on developments in the world economy. The contraction in Austria’s GDP owing to the global financial and economic

⁵ See Ragacs and Vondra (2009) for an analysis of the development of Austrian exports to CESEE countries.

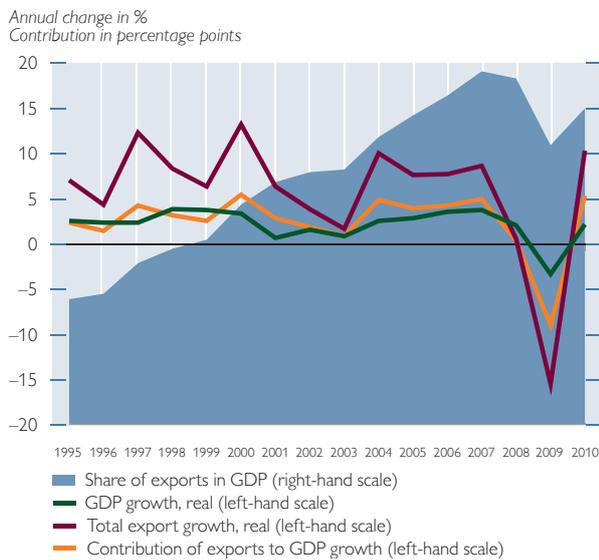
crisis in 2009 was above all caused by the slump in global trade and its effects on domestic exports. These export losses have since been offset almost completely, though; by the second quarter of 2011, real goods exports had rebounded to just around 4% be-

low the peak value recorded in early 2008.

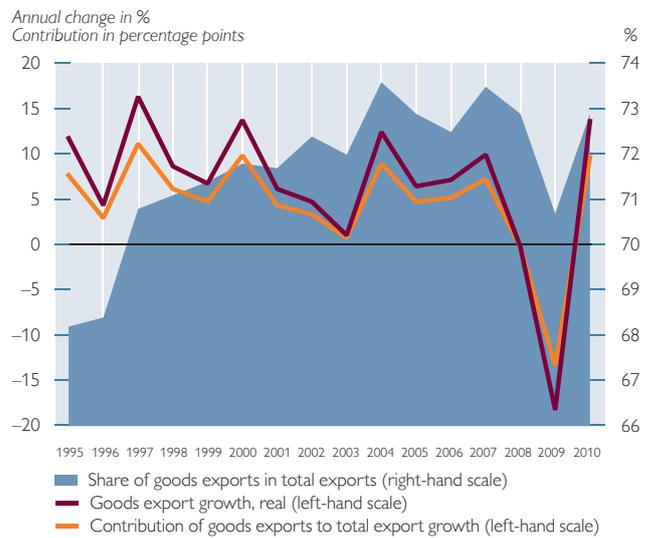
With a share of more than 70% in total exports, *goods exports* still play the dominant role. In recent years, however, the balance of services showed a surplus of some 5% of nominal GDP,

Chart 2

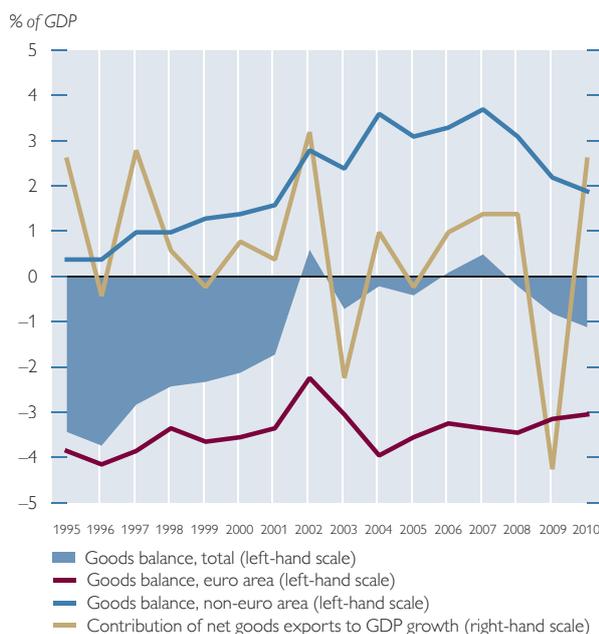
Total Exports



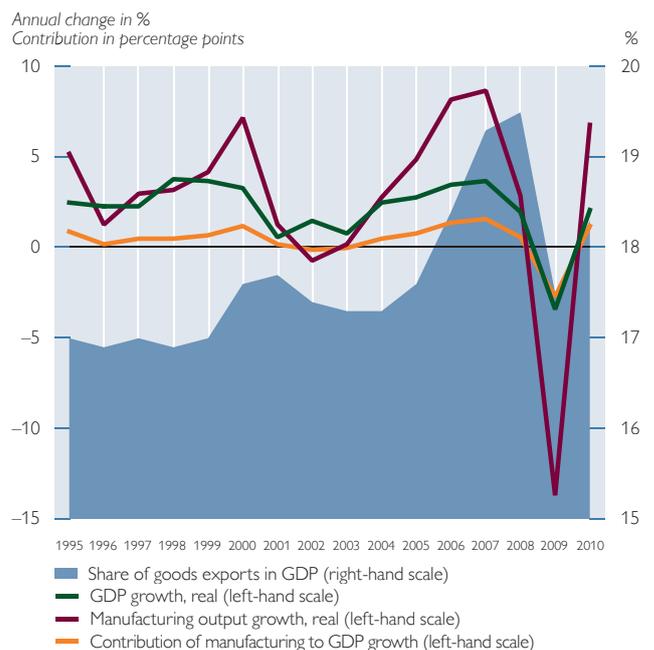
Goods Exports



Goods Balance and Net Goods Exports



Manufacturing Industry Output



Source: Statistics Austria, Austrian Institute of Economic Research; quarterly national accounts data (flash estimate Q2 2011), authors' calculations.

while Austria's *balance of goods* was slightly negative except in 2006 and 2007. This deficit on the goods balance was attributable to developments in the euro area, as the goods balance with countries outside the euro area registered a surplus.

The share of *manufacturing* in GDP is below 20%, and its average contribution to GDP growth was around 30% in the period from 1995 to 2010. The crisis-related slump in exports translated into a marked decline in manufacturing output, which contracted by almost 14% in 2009 (Q2 2011 flash estimate). The export orientation of Austria's man-

ufacturing industry is also shown by the large share of export firms. In the period from 1997 to 2006, exporting firms accounted for around 56.5% of Austrian firms (Pöschl et al., 2009).

Tables 1 and 2 show the structure and development of the Austrian export goods industry broken down by industries and destination countries. The *breakdown by industries* reveals some structural shifts over time. "Machinery and transport equipment," "Manufactured goods," "Chemicals and related products," and "Miscellaneous manufactured articles" account for the lion's share of Austria's goods exports. This

Table 1

Austria's Goods Exports by Industries over Time

	1995	2000	2005	2010	1995–2000	2000–2005	2005–2010	2008	2009	2010
	Share in total exports in %				Average annual growth in %			Year-on-year growth in %		
Total exports FOB	100.0	100.0	100.0	100.0	11.0	7.8	3.3	2.5	–20.2	16.7
Food (SITC 0)	3.3	3.6	4.2	5.2	14.7	9.5	8.1	15.4	–9.3	8.6
Beverages and tobacco (SITC 1)	0.7	1.1	1.9	1.5	20.3	18.4	0.2	–11.2	–11.3	6.5
Crude materials (SITC 2)	4.1	3.4	3.0	3.4	7.0	5.1	4.2	–3.5	–19.4	24.6
Fuels and electricity (SITC 3)	1.0	1.3	4.6	3.2	11.1	37.1	3.2	28.7	–26.3	17.7
Oils, fats and waxes (SITC 4)	0.1	0.1	0.1	0.2	13.5	6.2	14.2	66.5	–25.4	33.6
Chemicals and related products (SITC 5)	9.2	9.2	9.8	13.0	11.2	8.7	9.6	6.3	–6.1	16.9
Medicinal and pharmaceutical products (SITC 54)	2.3	2.8	3.8	5.7	14.7	13.8	13.7	9.9	10.6	11.9
Manufactured goods (SITC 6)	29.1	23.5	22.3	23.0	7.3	6.6	4.5	4.4	–26.3	19.3
Paper (SITC 64)	6.3	4.6	3.7	3.4	7.1	3.4	0.5	2.8	–14.0	9.2
Iron and steel (SITC 67)	5.7	4.2	5.7	5.6	7.1	13.3	6.6	13.6	–38.9	23.1
Manufactures of metals (SITC 69)	5.0	4.4	4.4	5.0	7.6	6.2	6.1	4.7	–26.5	19.1
Machinery and transport equipment (SITC 7)	39.0	43.9	41.6	37.8	13.2	7.2	0.4	–2.1	–24.3	17.2
Power-generating machinery and equipment (SITC 71)	5.8	5.2	4.9	5.5	8.1	5.5	6.0	–3.8	–9.8	19.8
Machinery specialized for particular industries (SITC 72)	5.7	5.4	5.3	5.2	9.3	7.5	3.1	5.4	–32.3	14.3
General industrial machinery and equipment (SITC 74)	6.4	5.6	5.9	6.1	9.3	7.4	4.5	5.6	–23.0	9.0
Electrical machinery (SITC 77)	7.5	8.8	7.3	7.3	13.5	6.0	2.4	1.8	–21.9	27.6
Road vehicles (SITC 78)	7.3	9.9	11.8	8.0	19.4	10.9	–3.6	–11.1	–35.8	20.3
Miscellaneous manufactured articles (SITC 8)	13.3	13.0	11.9	11.8	10.1	5.2	3.2	3.7	–11.4	9.0
Miscellaneous manufactured articles, n.e.s. (SITC 89)	5.3	5.8	5.2	5.4	10.8	4.4	4.4	4.7	–8.5	10.9
Commodities and transactions not classified elsewhere (SITC 9)	0.1	0.8	0.5	1.0	71.8	43.9	20.5	2.9	–5.0	89.4

Source: Statistics Austria, authors' calculations.

Note: The FOB (free on board) value refers to the value of (customs-cleared) goods at the point of exit from the exporting country, i.e. the ex works price inclusive of transportation, insurance and loading costs up to the frontier of the exporting country's customs territory. N.e.s. means "not elsewhere specified."

share declined from 91% in 1995 to 86% in 2010, which means that the range of export goods has increased in that period.

The share of “Machinery and transport equipment” was more or less as high in 2010 as in 1995, namely 38%, but had already been well above 40% at the turn of the millennium. The importance of “Manufactured goods” declined by 6.1 percentage points, whereas that of “Chemicals” increased by 3.2 percentage points between 2005 and 2010. This rise can be mostly attributed to the above-average growth in exports of “Medicinal and pharmaceutical products” over the entire period under review, which was the only large industry that continued to expand even during the crisis year 2009. The sectors hit hardest

by the crisis were “Manufactured goods” (primarily “Iron and steel” and “Manufactures of metals”) as well as “Machinery and transport equipment” (above all “Machinery specialized for particular industries” and “Road vehicles.”) When world trade recovered in 2010, these sectors quickly made up for the ground they had lost – in May 2011, “Machinery and transport equipment” and “Manufactured goods” again reached the levels recorded in September 2008.

A look at *exports by destination* shows considerable shifts in the structure of export markets. Between 1995 and 2010, Austrian exports to the CESEE region (country sample comprising 29 countries) rose from 14% to 21%, those to the EU-10 increased from 11% to 16%.⁶ By contrast, the share of exports to

Table 2

Austria's Goods Exports by Destinations over Time

	1995	2000	2005	2010	1995–2000	2000–2005	2005–2010	2008	2009	2010
	Share in total exports in %				Average annual growth in %			Year-on-year growth in %		
Total exports	100.0	100.0	100.0	100.0	11.0	7.8	3.3	2.5	–20.2	16.7
Europe	87.0	85.5	83.8	82.1	11.0	7.3	2.9	2.6	–21.1	16.0
Asia	6.6	5.9	6.6	8.8	7.9	10.7	8.9	9.4	–10.9	19.3
America	4.6	6.8	7.4	7.0	16.2	11.0	2.0	–3.7	–22.0	25.8
Africa	1.2	1.2	1.2	1.3	6.0	10.8	5.6	–6.2	–9.2	3.8
EU-27	77.2	74.7	73.2	70.5	10.8	7.1	2.6	2.0	–21.5	16.0
Euro area (EA-17)	63.0	57.8	56.3	54.1	9.7	6.9	2.5	1.3	–19.5	16.1
EU-10 (NMS)	11.2	13.5	14.5	15.8	15.3	9.4	4.9	8.9	–26.3	14.5
CIS (12)	1.8	1.5	2.6	3.5	7.4	24.0	11.5	17.4	–30.7	20.3
CESEE (29)	14.2	16.5	19.3	21.3	14.7	11.3	5.4	10.0	–26.7	14.1
Germany	38.4	33.4	31.8	31.6	8.6	6.1	3.0	1.6	–16.7	18.3
Italy	8.8	8.7	8.6	7.8	12.3	8.3	1.8	–1.4	–24.8	13.0
Switzerland	5.8	6.8	4.9	5.1	12.2	3.0	4.0		–4.1	18.5
U.S.A.	3.0	5.0	5.6	4.5	18.0	11.7	–1.1	–9.9	–22.4	22.9
France	4.4	4.4	4.2	4.2	10.4	7.0	3.1	7.0	–16.2	22.9
Czech Republic	2.7	2.9	3.1	3.8	12.7	9.5	7.1	7.7	–22.1	20.8
Hungary	3.6	5.0	3.4	3.1	15.5	1.4	0.0	5.2	–30.8	14.7
United Kingdom	3.3	4.4	4.1	3.0	17.1	6.4	–2.1	–9.0	–22.1	15.6
China	0.8	0.7	1.3	2.6	10.4	20.9	16.6	14.4	7.5	39.2
Poland	1.4	1.6	2.0	2.5	16.8	12.1	9.1	8.6	–25.2	12.1

Source: Statistics Austria, authors' calculations.

Note: Export countries are ranked by their share in Austrian exports in 2010.

⁶ See Francois and Wörz (2011) for an analysis of structural changes in CESEE countries between 1995 and 2007.

Europe (the EU) declined from 87% to 82% (77% to 71%) in the same period. In a 2010 ranking of Austria's top ten export markets, Germany – which accounts for 30% of the country's exports – is still number one by a large margin, followed by Italy and Switzerland. Still, in recent years, Austria managed to expand its exports to large emerging economies like China, Turkey, Brazil, India or South Africa. In 2010, China was already one of Austria's ten most important export markets. This means that the Austrian export industry was able to diversify both in terms of export goods and export markets. Given the strong export orientation of the Austrian economy, both aspects are essential to limiting the country's vulnerability to sectoral or regional external shocks.⁷

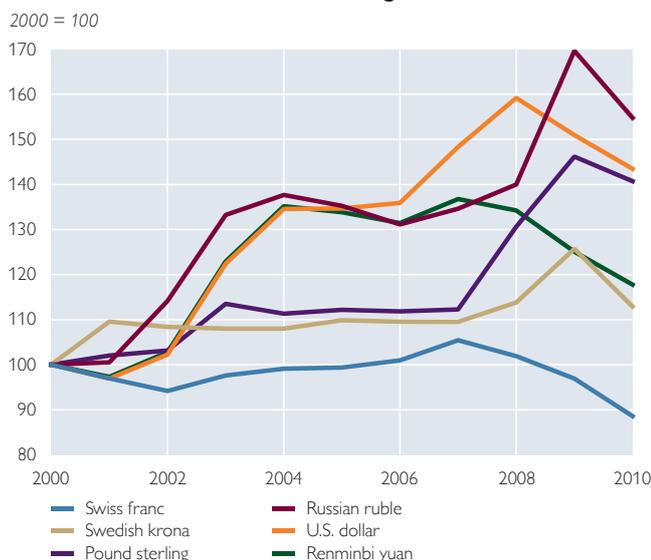
3 Price Competitiveness of the Austrian Manufacturing Industry

In addition to distinguishing between price and non-price competitiveness, the literature also breaks down price competitiveness into price competitiveness in the narrow sense of the word and cost competitiveness. While the first category focuses on the pricing of finished goods, the second focuses on production costs. Naturally, the two are by no means independent of each other, as low production costs make it possible to sell at a low retail price – cost competitiveness has an influence on price competitiveness. In the following, we will first focus on an international comparison of price competitiveness in the narrow meaning of the term, and then we will discuss the underlying

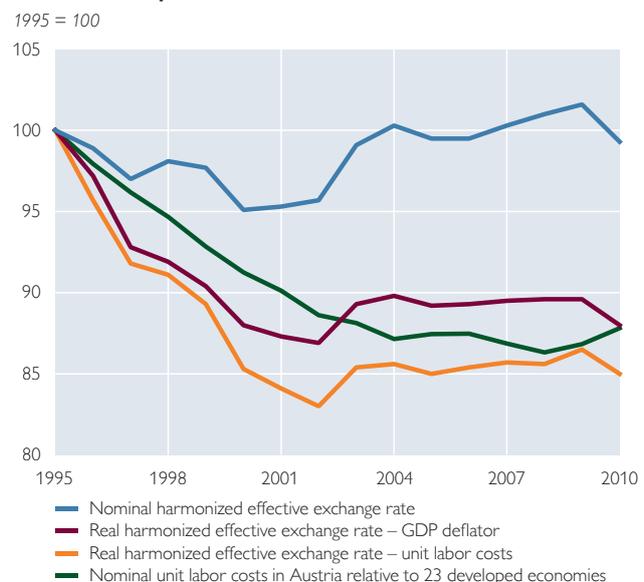
Chart 3

ECB Bilateral Reference Exchange Rates and Selected Competitiveness Indicators for Austria

Selected Bilateral Reference Exchange Rates of the ECB



Selected Competitiveness Indicators



Source: Reference rates and harmonized exchange rates: ECB ("harmonized competitiveness indicator", small country sample, see footnote 11); unit labor costs: European Commission (AMECO); authors' calculations.

Note: Bilateral reference rates in direct quotation (e.g. USD/EUR); a rise in effective exchange rates denotes a loss in competitiveness.

⁷ The experience of the global economic crisis also underscores this point. In 2009, Austria's exports to the EU and the U.S.A. contracted by 22%, respectively; those to Switzerland declined only slightly (-4%). In contrast, Austria even exported more goods (+8%) to China than it had in 2008.

factors of unit labor costs, which affect cost competitiveness.

Chart 3 gives an overview of common indicators of price competitiveness. The left panel shows selected bilateral reference exchange rates for the euro, while the right panel depicts the nominal effective exchange rate of the euro from an Austrian perspective (weighted by Austria's trading partners), two ECB competitiveness indicators and unit labor costs in Austria over time.

3.1 Bilateral Nominal Exchange Rates

Exchange rate changes can be interpreted as losses or gains in competitiveness: Depreciation makes a country's exports cheaper and imports more expensive. Depreciation is commonly assumed to have a positive effect on a country's trade balance.⁸ Chart 3 shows that, in the period from 2000 to 2010, the Swiss franc was the only reference currency to appreciate against the euro. The euro appreciated against all other currencies in that period, which reduced the price competitiveness of Austrian exports.

During the financial and economic crisis – more specifically, in 2009 – the euro even appreciated quite sharply against the pound sterling, the Russian ruble and the Swedish krona. At the same time, it depreciated against the U.S. dollar and thus also against the renminbi yuan. In 2010, problems regarding the sustainability of public finances in several euro area countries

caused the euro to depreciate against all reference currencies.

Changes in bilateral exchange rates (e.g. USD/EUR) say only little about relative changes of a country's competitiveness. Simulations for Austria with the OeNB's macroeconomic model (Austrian Quarterly Model) show that, excluding the effects on Austria's trading partners, an appreciation of the euro against the U.S. dollar by 10% causes GDP to contract by just 0.11 percentage points after three years compared with the baseline scenario. This effect roughly doubles if we consider the effects on Austria's trading partners in the euro area. The low elasticity of Austrian exports to changes in bilateral exchange rates can be ascribed above all to the fact that the country is part of the monetary union, which means that the lion's share of domestic exports is not affected by exchange rate changes, and to the fact that the U.S.A. accounts for just a small share in Austria's total exports (table 2).

3.2 Effective Exchange Rates

Bilateral exchange rates do not consider the relative importance of a country's trading partners. By contrast, *effective exchange rates* capture changes in a currency's value against a currency basket, i.e. they reflect the weight of a country's trading partners.⁹ The simplest type, *nominal effective exchange rates*, does not consider relative price or cost changes between trading partners, whereas *real effective exchange rates* also take into

⁸ Empirically, it is essential to distinguish clearly between short-term and long-term effects. The so-called J-curve describes the effects of currency depreciation over time. Because of differences in the reaction velocity of imports and exports, currency devaluation first causes net exports to decline and then to rise in the long run. Empirical evidence of the J-curve effect is mixed, though. In the long run, the trade balance can improve only if the sum of the demand elasticities for a country's exports and imports is greater than 1 (Marshall-Lerner condition). See Ritzberger-Grünwald and Würz (2010) for a recent discussion of the J-curve effect, the Marshall-Lerner condition and an overview of the current empirical literature.

⁹ By using double exports weights, it is also possible to take third-market effects into account. See Hahn et al. (2001), Köhler-Töglhofer et al. (2006) and Köhler-Töglhofer (1999) on the computation of effective exchange rates and double weights.

account price and cost developments in the individual countries. Typically, these exchange rates are deflated by an indicator of consumer price developments, the GDP deflator, or unit labor costs.

In this study, we use ECB effective exchange rates for comparability reasons.¹⁰ The ECB constructs *harmonized competitiveness indicators* for the manufacturing industry of each euro area country (nominal effective exchange rate indices deflated by various price and cost indices for each Member State based on bilateral data on trade in manufactured goods).¹¹

Chart 3 (right panel) shows the most important *competitiveness indicators for the Austrian manufacturing industry* over time: the nominal effective exchange rate of the euro and the ECB's harmonized competitiveness indicators (real effective exchange rates of the euro for Austria) deflated by the GDP deflator and unit labor costs. A rise in effective exchange rates is equivalent to a loss in price competitiveness.

The nominal effective exchange rate for Austria, while subject to some volatility, remained broadly stable between 1995 and 2010. Austria nonetheless gained in price competitiveness during that period because its real effective exchange rate was improving – particularly between 1995 and 2002 and when deflated by unit labor costs. Following a temporary deterioration after 2002, Austria's price competitiveness has since remained fairly unchanged. In the second half of the 1990s, the Austrian manufacturing industry had been able to raise productivity considerably and

therefore profited from the effects of European integration and the opening of Eastern European markets.¹² These special effects wore off gradually from the early 2000s, and productivity growth slowed. Another dampening effect came from exchange rate developments between 2002 and 2004 (chart 3).

Chart 4 compares long-term developments in Austria's price competitiveness – measured by the ECB's internationally comparable real harmonized competitiveness indicator – with that of other euro area countries. This comparison reveals that Austria has performed very well since 1995:

- Together with Germany, France and Finland, Austria belongs to the small group of euro area members that managed to *improve their long-term competitiveness between 1995 and 2010* (Austria: around +12%).
- Moreover, in terms of long-term improvements in price competitiveness, Austria is outranked only by Germany (around +23%).
- As mentioned earlier, Austria's price competitiveness improved above all between 1995 and 2002 and remained *broadly unchanged from 2004* (except in 2010). A euro area comparison shows that this is still a favorable result: Only one country (Germany) recorded markedly better results than Austria, and only three other countries (Finland, France and Italy¹³) recorded similar results.
- All other euro area countries posted in part dramatic losses in competitiveness. The countries that feature

¹⁰ See ECB (2000) and ECB (2005) on the methodology used.

¹¹ The ECB computes most competitiveness indicators for two country groups, one small sample (euro area countries and 20 trading partners) and one large sample (euro area countries and 40 trading partners). We use the small sample as some of the indicators used in this article are not computed for the large sample.

¹² See Köhler-Töglhofer et al. (2006) for a detailed analysis of developments in Austria's price competitiveness.

¹³ In Italy, however, competitiveness deteriorated sharply between 1995 and 2003.

most prominently in the current economic policy discussion – Greece, Ireland, Spain, Portugal, and Italy – witnessed losses in price competitiveness between around 10% and 20% from 1995 onward. Price competitiveness in Ireland even deteriorated by more than 30% until 2007. Losses in price competitiveness were especially striking in Estonia and Slovakia, at more than 60% and 80%, respectively, which was mainly attributable to the massive eco-

nomical catching-up process in these countries.¹⁴

3.3 Determinants of Cost Competitiveness

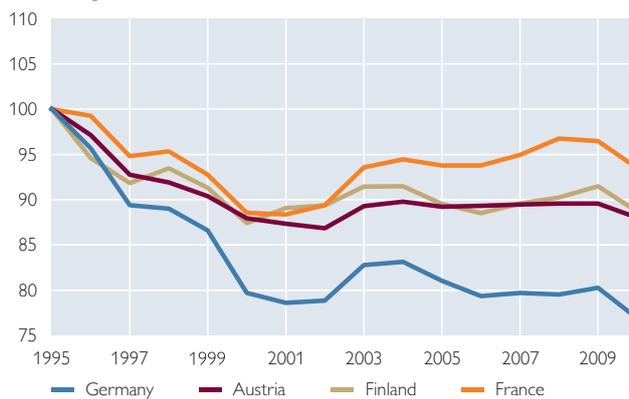
Chart 3 (right panel) also compares the evolution of unit labor costs in Austria with an average of 23 developed countries (AMECO database). Above all the indicator deflated by unit labor costs highlights that the price competitiveness of Austria's manufacturing sector improved sharply until

Chart 4

Real Harmonized Competitiveness Indicator, Deflated by GDP Deflator

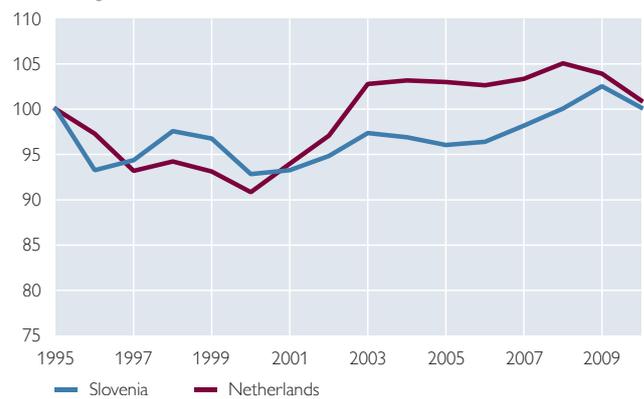
Gains in Competitiveness

Cumulated growth rates, 1995 = 100



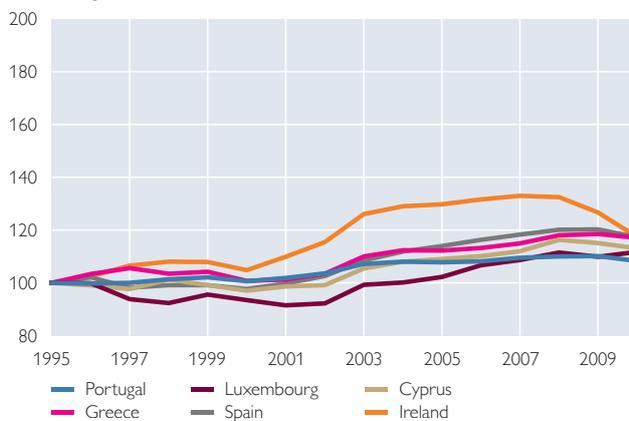
Unchanged Competitiveness

Cumulated growth rates, 1995 = 100



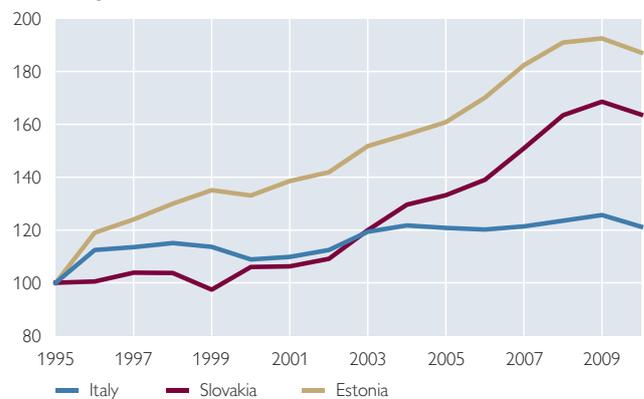
Losses of up to 20%

Cumulated growth rates, 1995 = 100



Losses above 20%

Cumulated growth rates, 1995 = 100



Source: ECB, authors' calculations.

¹⁴ These losses occurred despite positive (qualitative) structural changes in the two countries (see e.g. Dulleck et al., 2005; Ito and Okubo, 2010).

2002. The determinants of this rise in cost competitiveness are of special interest. By definition, *real unit labor costs* fall when nominal wages decline or nominal labor productivity increases (box 2). Moreover, real unit labor costs are identical to the adjusted labor share in GDP, and thus also indicative of the degree to which compensation is

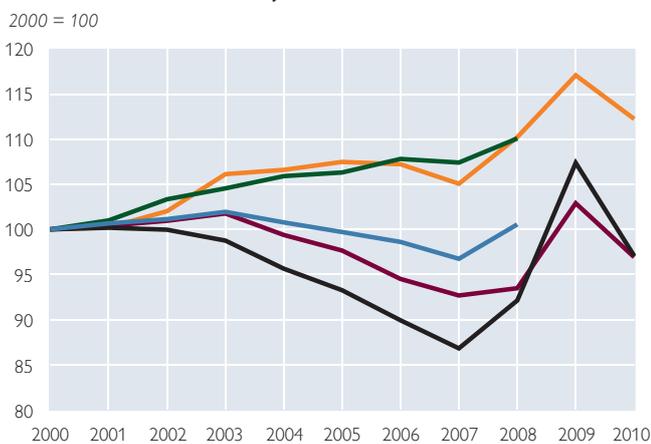
productivity based (box 2). This means that – *ceteris paribus* – competitiveness improves when the adjusted labor share declines.

Chart 5 shows real unit labor costs, nominal wages, nominal labor productivity and manufacturing employment in Austria and selected other countries over time.¹⁵ *Real unit labor costs* in

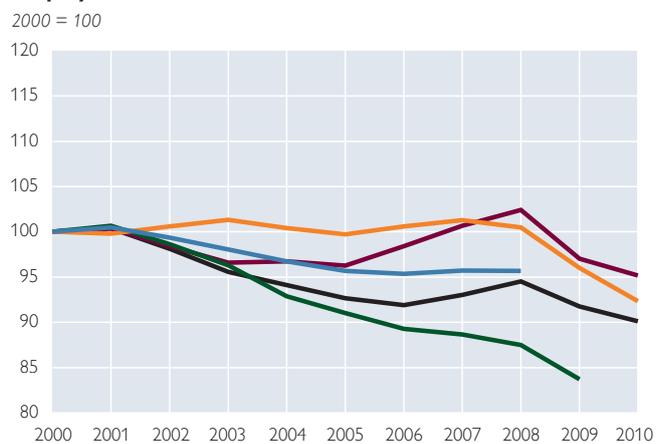
Chart 5

Determinants of Cost Competitiveness in Manufacturing

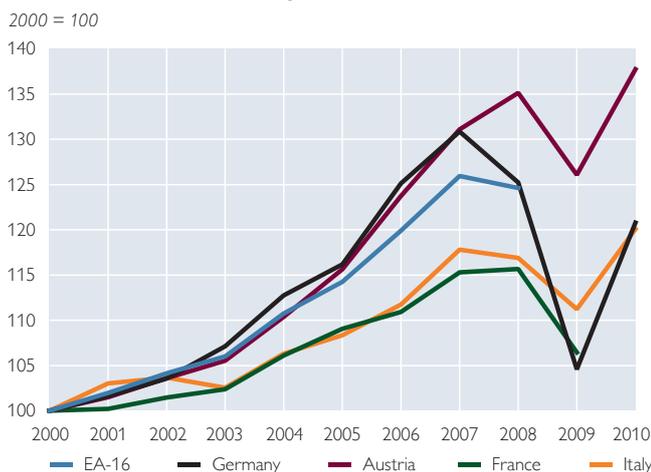
Real Unit Labor Costs/Adjusted Labor share



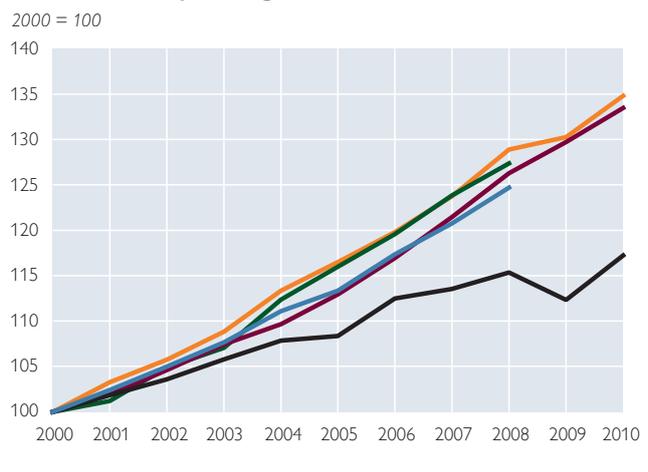
Employment



Nominal Labor Productivity



Nominal Per-Capita Wages



Source: European Commission (AMECO), authors' calculations; panel on employment: euro area-16 excluding the Netherlands.

¹⁵ For reasons of comparability, the data were obtained from the AMECO database (see References). Distortions may occur due to national differences in the handling of full-time equivalents. All euro area countries except Spain, France, Italy, the Netherlands and Austria record per-capita employment and not full-time equivalents in their employment statistics. During the crisis, above all Germany and Austria relied on short-term working arrangements, so that the employment figures for Austria understate employment developments when compared with Germany, but not when compared with Italy and France. Differences in the share of temporary agency work across countries are another source of distortions in the data.

Real Unit Labor Costs and Productivity-Based Wages

Real unit labor costs (ULC^r) in manufacturing are defined by the relation of the real wage bill (WB^r) per employee (PE) to real gross value added (Y^r) per total employment (TE):¹

$$ULC^r = \frac{WB^r/E}{Y^r/TE}$$

We calculate the wage bill by multiplying the average wage per employee and the number of employees. Then we deflate wages and gross value added by the producer price index, p_y , so that real unit labor costs can be written in the following form:

$$ULC^r = \frac{WB^r/E}{Y^r/TE} = \frac{w^n E/E}{Y^n/TE} \frac{p_y}{p_y} = \frac{w^n}{Y^n/TE} = w^n * \text{Prod}^{-1}$$

Hence, unit labor costs will drop in real terms as nominal wages decrease and as nominal labor productivity increases.

Productivity-based compensation implies that nominal wages rise or fall exactly in line with the sum of the changes in prices and productivity. If this is the case, the adjusted labor share of an industry remains constant. The labor share (LS) is defined as the quotient of an industry's nominal wage bill and its nominal value added, or $LS = WB^n/Y^n$. The labor share is adjusted so as to single out changes that arise from changes in the employment structure alone. If we adjust the labor share by the composition of employment (payroll and self-employed), the adjusted labor share (LS_a) can be written as

$$LS_a = \frac{WB^n}{Y^n} \frac{TE}{E} = \frac{w^n E}{Y^n} \frac{TE}{E} = w^n * \text{Prod}^{-1} = LSK^r$$

The adjusted share is therefore identical to real unit labor costs.

¹ Nominal variables are indicated with an n, real variables with an r. See Marterbauer and Walterskirchen (2002) for relations between the labor share and real unit labor costs.

the Austrian manufacturing industry – and hence the adjusted labor share – increased slightly between 2000 and 2003 and then declined markedly until 2007. That year, real unit labor costs were some 7% below the level observed in 2000. When the crisis started to unfold in 2008, unit labor costs first stagnated and then rose markedly in 2009. In 2010, they declined again to just below the 2000 level. Germany recorded very similar developments, but unit labor costs fell even faster than in Austria. In contrast, in France and Italy, unit labor costs increased almost every year until 2009. In 2010, unit labor costs in Italy were

around 12% higher than in 2000. In the euro area as a whole, unit labor costs in 2008 were at the same level as in 2000.

While the evolution of nominal wages was rather inconspicuous in Austria compared with other countries, *labor productivity* rose markedly. Labor productivity can be improved either by cutting employment using existing technology or by keeping employment constant and upgrading the technology used. Even though Austria recorded more favorable employment developments than the reference countries, its manufacturing productivity rose much faster, which means that technological

advances must have played an important role in raising productivity. Germany was the only other country to record quite similar productivity developments up until 2007, but from 2008, productivity declined much more sharply in Germany than it did in Austria.

Overall, wage moderation (more specifically, a declining labor share in value added) certainly had a significant impact on Austria's manufacturing competitiveness, but it was by no means the only reason for the favorable development. What also mattered were productivity gains that resulted from stronger technology growth in Austria relative to its trading partners.

4 CMSA, Market Shares and Overall Competitiveness

Section 3 focused on the evolution of Austria's price competitiveness. This section addresses the role its overall competitiveness – i.e. price and non-price competitiveness – played in the gain or loss of market shares by Austrian exporters. Economic growth in Austria – like in any other highly developed country – is lower than the global average, as this average includes emerging market economies, which are in a catching-up process. Accordingly, we might expect global import demand to rise and Austria's market shares to decline over time. In addition, more and more countries are entering international markets but limiting imports to their own domestic markets. This would also serve as an explanation of dropping market shares. However, domestic exports have been growing at higher rates than domestic GDP. In some periods, Austria's export industry

managed to not only keep its market shares but even expand them (see below for details).

An analysis of constant market shares (CMSA) provides information on the factors underlying a country's export performance. Gains or losses in market shares that are not due to growth developments in the export market as a whole or specific market segments are ascribed to changes in price and non-price competitiveness (overall competitiveness, see chart 1).¹⁶

Changes in a country's export shares according to CMSA (box 3) can be broken down into the following effects: First, the difference between the growth rates of Austrian and global exports¹⁷ (*total effect*) can be decomposed into a structural and a competition effect. While the *structural effect* describes gains or losses in market shares that can be attributed to structural changes in export demand for Austrian products, with competitiveness remaining constant, the *competition effect* covers the impact of price and non-price competitiveness. Second, the structural effect can be broken down into a market- and a product-related component, which allows us to analyze the reasons underlying this effect. While the *market effect* describes Austria's export performance in certain markets, the *product effect* captures the total performance of individual goods categories. In this contribution, we use CMSA to analyze the development of Austrian exports in the global market, the EU and the euro area.

4.1 Data Material Used

The analysis below for the period 2000 to 2009/10 uses two different data

¹⁶ Constant market shares and unchanged competitiveness over time correspond to a long-term equilibrium as described in box 1.

¹⁷ This comparison is also possible for other markets.

sources. Our first data source is the *UN Comtrade database*¹⁸, which contains global import and export data and was used to analyze changes in the *global share* of Austrian exports. The data set covers Austrian (global) goods exports (2000 to 2009) based on seven one-digit goods categories according to SITC Rev. 3.¹⁹ This way, 90% (83%) of all goods exported by Austria (the world) are taken into consideration on average across all years. Goods that do not enter the analysis directly (beverages and tobacco, fuels and energy, as well as other unspecified goods) are assigned to a residual category. We analyze Austrian exports to 49 countries, with export shares ranging from 31% (Germany) to 0.1% (Chile) in 2009. This allows us to assign 95% (90%) of all Austrian (global) exports to specific countries on average over time; all other countries are included in an aggregate.

Between 2000 and 2008, Austria's (global) exports rose by 170% (148%) in nominal terms; in 2009, they dropped by 24%, respectively, owing to the financial and economic crisis. The share of Austrian exports in global exports was 1.02% in 2000, peaked at 1.24% in 2004 and came to 1.11% in 2009.

Given that UN Comtrade data are expressed in U.S. dollars for all countries, exchange rate changes also have an impact on our CMSA results, as market shares are over- or understated as a result of sharp exchange rate movements.

Our second data source²⁰ is the *European Commission's Comext database*,²¹ which we use for analyzing Austria's market position in the EU and the euro area.²² In this database, exports are expressed in euro, which reduces the impact of exchange rate changes in our CMSA results. This data set contains Austria's goods exports to the EU and all imports by EU-27 countries. The data – which are available for the period from 1999 to 2010 – are also used to analyze Austria's exports to the euro area. Exports are assigned to ten different product categories (in line with SITC Rev. 4)²³. The Eurostat Comext database (unlike the UN Comtrade database) explicitly includes exports of “Mineral fuels.”

4.2 Main Results

Chart 6 presents the main CMSA results on the international position of Austrian manufacturing (indexed to the year 2000). The left panel shows the market shares of Austrian manufacturing (total effect) over time and a breakdown into a structural effect and a competition effect, while the right panel shows a decomposition of the structural effect into market and product effects.

In the period from 2000 to 2004, Austrian exporters recorded gains in market shares, which started shrinking again from 2005 but remained broadly unchanged in the crisis year 2009. The competition effect was less pronounced but followed the same pattern over the

¹⁸ United Nations Commodity Trade Statistics Database, freely accessible at <http://comtrade.un.org/> (retrieved on August 10, 2011).

¹⁹ See <http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=14> (retrieved on September 28, 2011).

²⁰ UN Comtrade and Eurostat Comext data are not fully identical with Austrian national accounts data because different methods are used to compile the data.

²¹ This is the Eurostat database on external trade for the EU and its Member States. See <http://epp.eurostat.ec.europa.eu/newxtweb/> (retrieved on September 28, 2011).

²² Comparing the analysis results based on both databases allows us to test the results for consistency and to gauge the impact of exchange rate effects.

²³ See <http://unstats.un.org/unsd/trade/sitcrev4.htm> (retrieved on September 28, 2011).

Constant Market Shares Analysis (CMSA)

The analysis of constant market shares goes back to the pioneering work of Tyszynski (1951) and was developed further by Richardson (1971a, 1971b) and Milana (1988). Skriner (2009) provided a comprehensive discussion of the theoretical aspects of CMSA, while Widodo (2010) highlighted the differences between the various approaches and contributed an in-depth analysis of the competition effect. CMSA is now a standard tool for explaining international competitiveness. Examples of recent applications are Skriner (2009) for Austria, Deutsche Bundesbank (2006) for Germany, and ECB (2005) for the euro area.

Our analysis is based on simple transformations and expansions of changes (d) in Austria's world market shares (Austrian exports, X^{AT} / global exports, X^W):

$$\frac{d\left(\frac{X^{AT}}{X^W}\right)}{\frac{X^{AT}}{X^W}} = \frac{dX^{AT}}{X^{AT}} - \frac{dX^W}{X^W} = \sum_i \sum_j \frac{X_{ij}^{AT}}{X^{AT}} \frac{dX_{ij}^{AT}}{X_{ij}^{AT}} - \sum_i \sum_j \frac{X_{ij}^W}{X^W} \frac{dX_{ij}^W}{X_{ij}^W} \quad (1)$$

The percentage change in Austria's world market shares thus corresponds to the difference between the growth rates of Austrian and global exports. It can be broken down into the sum of exports to all countries i and all products j . We expand the equation by the identical terms

$$+ \sum_i \sum_j \frac{X_{ij}^{AT}}{X^{AT}} \frac{dX_{ij}^W}{X_{ij}^W} - \sum_i \sum_j \frac{X_{ij}^{AT}}{X^{AT}} \frac{dX_{ij}^W}{X_{ij}^W}$$

which allows us to transform and reinterpret equation 1 as follows:

$$\frac{d\left(\frac{X^{AT}}{X^W}\right)}{\frac{X^{AT}}{X^W}} = \underbrace{\sum_i \sum_j \left(\frac{X_{ij}^{AT}}{X^{AT}} - \frac{X_{ij}^W}{X^W}\right) \frac{dX_{ij}^W}{X_{ij}^W}}_{\text{structural effect}} + \underbrace{\sum_i \sum_j \left(\frac{dX_{ij}^{AT}}{X_{ij}^{AT}} - \frac{dX_{ij}^W}{X_{ij}^W}\right) \frac{X_{ij}^{AT}}{X^{AT}}}_{\text{competition effect}} \quad (2)$$

The structural effect quantifies changes in world market shares based on industry and regional specialization in combination with shifts in the world market structure. In contrast, the competition effect describes developments that are independent of market and industry growth. By rewriting the double sum, we can decompose the structural effect into

- a market effect $\sum_i \left(\frac{X_i^{AT}}{X^{AT}} - \frac{X_i^W}{X^W}\right) \frac{dX_i^W}{X_i^W}$
- a product effect $\sum_j \left(\frac{X_j^{AT}}{X^{AT}} - \frac{X_j^W}{X^W}\right) \frac{dX_j^W}{X_j^W}$ and
- a mixed effect (structural effect minus market and product effects).

The market effect denotes the regional distribution of exports, while the product effect captures the influence of product differentiation. The mixed effect represents differences between individual industries regarding the geographical focus of exports and can be considered a residual (negligible in this case).

entire period. The market effect was the dominant factor in the evolution of the structural effect, as demand growth in Austria's export markets was quite dynamic in a global comparison. A look

at the product effect reveals a weakness, though: The goods Austria exported in the period under review do not belong to the fast-growing industries on a global scale.

CMSA

Decomposition of the Market Shares

2000 = 100



Decomposition of the Structural Effect

2000 = 100



Source: UN Comtrade, authors' calculations.

The market effect and the product effect can be broken down by countries (or country groups) and products. For reasons of clarity, we decided to present the effects based on three periods reflecting the distinct developments in market shares described above (chart 7):

- In the period from 2001 to 2004, the Austrian export industry posted considerable gains in market shares. While losing ground in the Anglo-American region, Austria managed to expand significantly in its main export markets, Germany, Italy, and Switzerland, as well as the CESEE countries. Looking at the product range, Austrian exports of “Chemical products” declined, but a marked rise was recorded for “Manufactured goods” and “Machinery and transport equipment.”
- In the second period, from 2005 to 2007, the market effect again indicates an increase in market shares in Germany (between 2003 and 2008), but also in Italy, Switzerland and the CESEE countries (above all, the Czech Republic, Hungary, Romania, Slovenia and Slovakia). This period was also again characterized by a loss of market shares in the Anglo-American region and Asia (most notably China). As to the product effect, the tendencies observed in the first period continued: Austrian exporters were again able to expand their market shares in “Manufactured goods” and “Machinery and transport equipment” but lost ground in “Crude materials” and “Chemical products.” Like in the first period, products that were assigned to the residual category contributed significantly to the negative effect.
- While Austria’s market shares remained almost unchanged during the *financial and economic crisis*,²⁴ the dynamics observed earlier reversed. Austrian exporters lost some ground in Germany, Italy, Switzerland and

²⁴ The financial and economic crisis caused GDP in Austria to contract only in 2009 (when looking at annual figures). On a quarterly basis, however, the economy contracted from the third quarter of 2008 to the second quarter of 2009 (flash estimate for Q2 2011). This is why we analyzed developments in the period of 2008 to 2009 separately. Please note that the total effects have to be smaller, as this period is shorter and effects are summed over the years.

the CESEE countries, but gained market shares in the U.S.A. Looking at the product effect, the market shares gained earlier in “Manufactured goods” and “Machinery and transport equipment” were lost again. Products that are not explicitly covered seem to have had no influence in the third period.²⁵

These results are corroborated by the analysis results based on Eurostat *Comext*

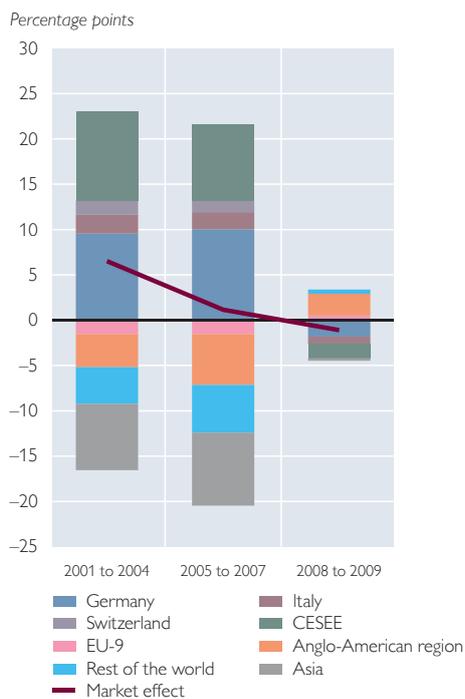
data on Austria's export position in the EU and the euro area²⁶ (chart 8), and they are qualitatively consistent with the findings of Skriner (2009).²⁷

Our analysis shows for all *three country samples* (world, EU, euro area) and the entire period under review (2000 to 2009) that Austria's neighbors in Central, Eastern and Southeastern Europe gained importance for the domestic export industry. The sharp

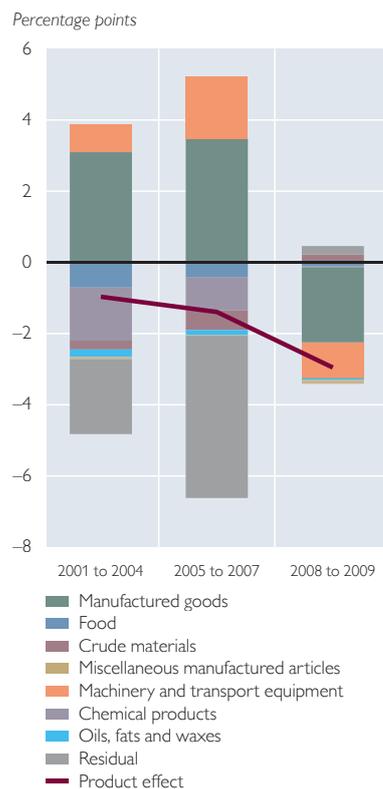
Chart 7

CMSA: Decomposition of the Structural Effect

Market Effect



Product Effect



Source: UN Comtrade, authors' calculations.

²⁵ This impression is misleading, however: These products make a considerable negative contribution in 2008 – which is probably due to the sharp rise in oil prices – but their effect is even stronger and positive in 2009, so that the overall effect is slightly positive.

²⁶ Detailed results on the EU and the euro area can be found in the annex.

²⁷ Skriner (2009) conducted a CMSA on Austria based on OECD data for a panel of 13 countries between 1990 and 2006 (SITC Rev.3). The data on goods exports are converted to euro, partly adjusted and smoothed with a HP filter to eliminate short-term volatility. Naturally, the results are less volatile, but – despite the differences in the country samples – they are very similar in terms of tendency and direction of the overall effect as well as the competition, product and market effects.

increase in market shares in Germany comes as a surprise – Austria gained more market shares there than in any other country. Hungary, Italy and the Czech Republic follow by a wide margin. China and the U.S.A are at the other end of the spectrum, with the loss in market shares in these two countries being as high as the gains observed in Germany.

5 CMSA, Price and Non-Price Competitiveness

Based on our analysis of traditional price competitiveness indicators (section 3) and the CMSA results reported in section 4, we can now discuss, at least qualitatively, the role price competitiveness has played in shaping the export performance of Austrian manufacturers over time. One key result of the CMSA was that we can quantify the contribution of overall (i.e. price and non-price) competitiveness to changes in market shares. If price competitiveness improves or worsens along the lines of overall competitiveness (as established with the CMSA exercise), this indicates that price competitiveness either helped or hindered manufacturing exports. If price competitiveness patterns diverge from the changes in overall competitiveness, then non-price competitiveness can be assumed to have played the dominant role.²⁸

The top left panel in chart 8 compares the market shares of Austrian goods exports in world trade as well as in trade with other EU and euro area countries. While developments were broadly similar, Austria's market shares in Europe declined more sharply from 2004 than its global market shares. This is consistent with the findings

reported in section 2 that Austria's export share in the EU has dropped in recent years.

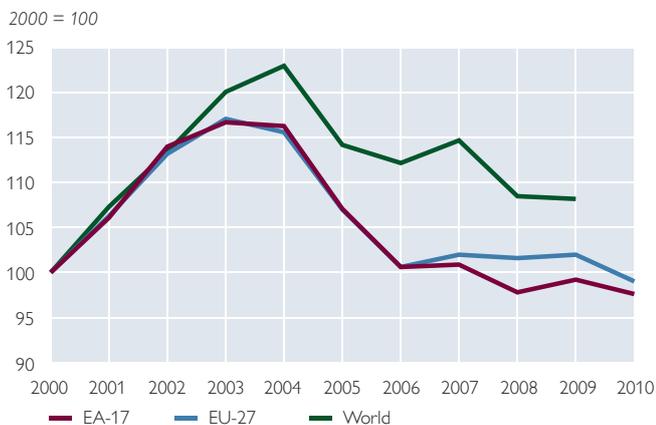
The top right panel in chart 8 shows the inverse of Austria's real effective exchange rate vis-à-vis all euro area countries and 20 other trading partners deflated by unit labor costs (the ECB's harmonized competitiveness indicator, see section 3). Using the inverse – where a rise indicates an improvement in competitiveness – makes it easier to compare the results with the competitiveness effect established through CMSA for the global, EU and euro area data sets, which are also depicted in this panel. This comparison highlights the stability of the results – the tendencies are identical for all three country groups. The differences between the EU and the euro area are remarkable, though. In the euro area, the structural effect remained relatively constant and developments were dominated by the competition effect, whereas in the EU, the structural effect (market effect due to the dynamic CESEE countries) was stronger and the competition effect was weaker than in the euro area.²⁹

Both price and overall competitiveness improved between 2000 and 2002, which makes it impossible to single out the effects of non-price competitiveness, as the role of specific effects is unclear. The real effective exchange rate remained almost unchanged between 2003 and 2008, while Austria's competitiveness declined markedly between 2003/04 and 2008. This means that non-price competitiveness must have deteriorated in that period. In the crisis year 2009, price competitiveness dropped above all due to a considerable rise in unit labor costs. Austria's competitive posi-

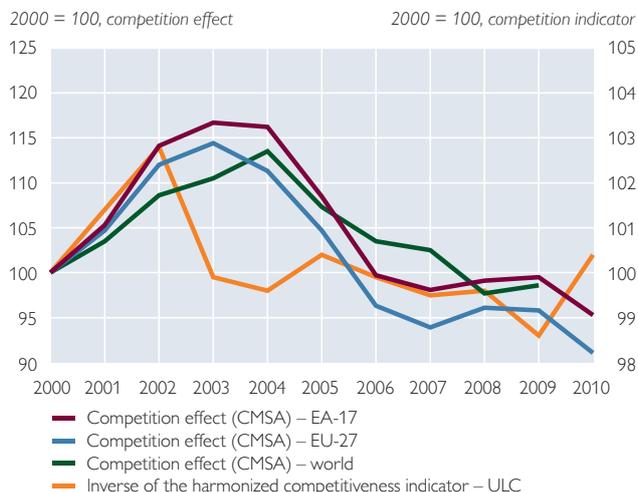
²⁸ With this method, it is impossible to determine whether or not the effects of price and non-price competitiveness are lagged.

²⁹ See the annex for detailed results.

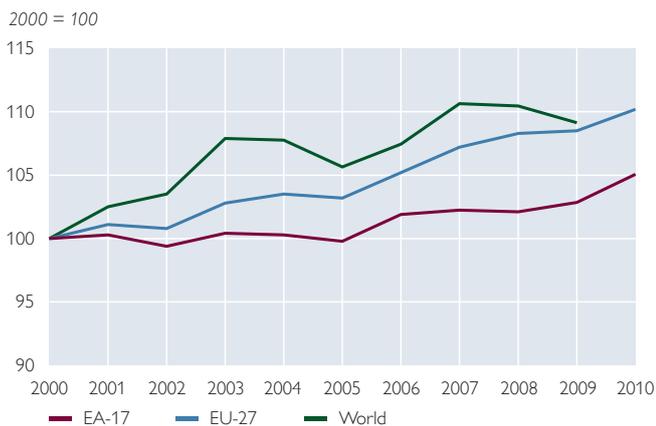
Austria's Market Shares



Competition Effect (CMSA) and Price Competitiveness



Market Effect



Product Effect



Source: UN Comtrade, Eurostat Comext, ECB, authors' calculations (results for Austria vis-à-vis the respective economic areas).

tion remained relatively constant, however, which suggests that non-price competitiveness had a positive impact on overall developments that year. A (lagged) negative effect of the loss in price competitiveness on market shares was not observed until 2010. All in all, when compared to developments between 2000 and 2007, the crisis seems to have had a remarkably moderate effect on Austria's export market shares in the (post-)crisis years 2008 to 2010.

6 Conclusions

Austria's export industry was very quick to respond to the opening up of markets in Central, Eastern and South-eastern Europe; Austria was thus among the few euro area countries that quickly seized the opportunity to expand to this region. Against this backdrop, the country's international competitiveness improved markedly until the turn of the century; real effective exchange rates dropped until 2002, and relative unit labor costs even declined until 2004 – so that Austrian

exporters achieved considerable gains in market shares. However, this trend reversed in 2005 and 2006, when Austrian exporters' market shares declined, and between 2007 and 2010 their market shares remained broadly unchanged in trade with other EU and euro area countries. While market shares rose and fell in sync with gains and losses of price competitiveness, and especially decreases and increases in unit labor costs, improvements in non-price competitiveness helped cushion the impact of changes in price competitiveness. This means that the period of above-average growth in Austria's booming export industry had come to an end even before the economic crisis hit. Still, Austria managed to keep its market shares, thus doing better than most other euro area countries. In addition, employment and productivity remained high by international comparison; unlike many other countries, Austria was able to keep manufacturing employment steady almost until the outbreak of the crisis.

During the financial and economic crisis, however, Austria faced a considerable breakdown of exports as its export industry had targeted above all industries that were hit especially hard. Still, these losses have been largely recouped over the past 1½ years. During and shortly after the crisis, Austria's international competitiveness declined mainly due to a rise in unit labor costs, but this

decline was only small compared with long-term patterns. Even market shares remained relatively unchanged by historical comparison. Following a temporary sharp decline during the crisis, productivity has since reached a new historical high. The crisis-related setback in demand may ultimately even have had a positive effect on the country's future competitive position: For one thing, Austrian export firms stepped up their diversification in terms of products and export markets, which had a significant positive impact even during the crisis and will likely reduce the vulnerability of Austrian exports to future exogenous shocks. And for another thing, firms in Austria (unlike in many other countries) made great efforts to keep employment stable during the crisis. These efforts were supported by accompanying economic policy measures, so that human capital losses were limited.

Still, in light of the global framework conditions and recent developments, world trade dynamics will remain a source of considerable uncertainty for a small open economy. Austrian exporters and economic policymakers are facing a major challenge: They have to continue diversifying in terms of export markets and product range, and they have to work on improving the country's international competitiveness on an ongoing basis.

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Table 1A

Annex

Overview of Results

Evolution of Austria's Exports and Market Shares

	Austria's export growth			Export growth			Change in Austria's export market shares		
	Euro area	EU	World	Euro area	EU	World	Euro area	EU	World
2000	15.39	16.00	7.43	23.68	23.79	14.49	-8.29	-7.79	14.49
2001	7.26	7.79	4.43	1.12	1.49	-2.92	6.14	6.30	-2.92
2002	5.47	5.60	9.96	-1.92	-0.89	4.28	7.39	6.49	4.28
2003	4.15	4.06	22.08	1.81	0.59	16.17	2.34	3.47	16.17
2004	8.66	8.17	24.17	8.93	9.48	21.83	-0.27	-1.31	21.83
2005	1.82	2.61	6.22	9.78	10.03	13.34	-7.96	-7.42	13.34
2006	6.60	7.87	13.97	12.67	13.85	15.76	-6.06	-5.98	15.76
2007	7.60	8.16	16.71	7.32	6.76	14.44	0.28	1.40	14.44
2008	1.92	4.07	9.99	5.01	4.45	15.44	-3.08	-0.38	15.44
2009	-18.67	-20.49	-23.71	-20.15	-20.87	-23.52	1.47	0.39	-23.52
2010	16.30	16.02		17.95	19.00		-1.66	-2.99	

Decomposition of the Changes in Market Shares

	Competition effect			Structural effect		
	Euro area	EU	World	Euro area	EU	World
2000	-4.77	-5.30	2.55	-3.53	-2.49	-7.06
2001	5.25	4.72	3.54	0.89	1.58	7.34
2002	8.39	6.99	4.91	-1.01	-0.50	5.67
2003	2.26	2.14	1.73	0.08	1.34	5.91
2004	-0.36	-2.72	2.70	0.09	1.41	2.34
2005	-6.70	-5.93	-5.48	-1.25	-1.49	-7.12
2006	-8.03	-8.04	-3.56	1.97	2.06	-1.79
2007	-1.61	-2.50	-0.90	1.89	3.91	2.27
2008	0.98	2.34	-4.71	-4.06	-2.72	-5.45
2009	0.40	-0.34	0.94	1.08	0.72	-0.19
2010	-4.24	-4.91		2.58	1.92	

Decomposition of the Structural Effect

	Market effect			Product effect			Mixed effect		
	Euro area	EU	World	Euro area	EU	World	Euro area	EU	World
2000	-1.11	-0.04	-9.61	-2.98	-2.86	-3.78	0.56	0.41	-0.31
2001	0.30	1.15	3.80	0.14	-0.03	-0.30	0.46	0.47	1.60
2002	-0.90	-0.36	0.76	-0.41	-0.46	-0.11	0.30	0.32	-0.10
2003	1.03	1.98	4.18	-0.87	-0.40	-0.34	-0.08	-0.24	0.27
2004	-0.12	0.70	-0.36	-0.09	0.15	-0.22	0.30	0.56	-0.02
2005	-0.51	-0.27	-1.64	-1.54	-2.17	-1.05	0.80	0.94	1.38
2006	2.12	1.90	1.77	-0.13	-0.74	-0.65	-0.02	0.90	0.70
2007	0.32	1.98	3.16	1.60	2.61	0.30	-0.03	-0.68	-0.10
2008	-0.14	0.98	-0.74	-4.38	-4.32	-3.71	0.45	0.63	3.14
2009	0.73	0.18	-1.13	0.48	0.50	0.76	-0.13	0.05	-0.69
2010	2.16	1.60		-0.27	-0.05		0.69	0.37	

Source: UN Comtrade, Eurostat Comext, authors' calculations.

Note: Results for Austria vis-à-vis the respective economic areas. See box 3 for a detailed description of the respective effects.

Table 2A

Product Effect

World	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Food	0.03	-0.07	-0.12	-0.30	-0.23	-0.13	-0.11	-0.17	-0.16	0.06
Crude materials	0.02	0.03	0.00	-0.10	-0.17	-0.11	-0.20	-0.26	-0.23	0.45
Oils, fats and waxes	0.05	0.00	-0.06	-0.09	-0.07	-0.01	-0.04	-0.09	-0.15	0.10
Chemical products	-0.05	-0.12	-0.34	-0.54	-0.49	-0.42	-0.27	-0.25	-0.18	0.15
Manufactured goods	0.90	-0.31	0.39	1.03	1.99	0.80	1.26	1.41	0.87	-2.98
Machinery and transport equipment	0.18	-0.04	0.04	0.20	0.56	0.63	0.56	0.56	0.38	-1.39
Miscellaneous manufactured articles	0.04	0.00	-0.01	-0.06	0.01	-0.03	0.01	0.01	-0.01	-0.10
Residual	-4.95	0.20	-0.01	-0.48	-1.82	-1.78	-1.86	-0.93	-4.22	4.46
Product effect	-3.78	-0.30	-0.11	-0.34	-0.22	-1.05	-0.65	0.30	-3.71	0.76

Source: UN Comtrade, SITC Rev. 3. The residual covers the difference between the sum total and the sum of the 7 goods categories; authors' calculations.

EU-27	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Food	-0.23	-0.12	-0.04	-0.06	-0.10	-0.13	-0.12	-0.10	-0.08	0.04	-0.09
Beverages and tobacco	0.00	0.01	0.00	0.00	0.02	0.01	0.02	0.05	0.01	-0.02	0.03
Crude materials	0.03	0.00	0.01	0.00	0.00	0.00	-0.02	0.00	0.00	0.05	0.16
Mineral fuels	-3.91	0.14	0.30	-0.34	-1.05	-2.55	-1.62	0.08	-3.20	4.39	-3.00
Animal and vegetable oils, facts and waxes	0.02	-0.02	-0.04	-0.01	-0.03	-0.03	-0.06	-0.01	-0.09	0.07	-0.04
Chemical products	-0.63	-0.22	-0.29	-0.10	-0.45	-0.54	-0.48	-0.32	-0.09	0.30	-0.58
Manufactured goods	2.03	0.02	-0.18	-0.04	1.08	0.59	1.63	1.23	-0.24	-2.94	2.33
Machinery and transport equipment	0.40	0.01	-0.17	-0.02	0.46	0.27	0.47	0.54	-0.16	-1.40	0.93
Miscellaneous manufactured articles	0.30	0.05	0.02	0.00	0.04	0.04	0.09	0.09	0.02	-0.10	0.09
Other unspecified goods	-0.86	0.09	-0.07	0.16	0.18	0.19	-0.67	1.05	-0.49	0.10	0.11
Product effect	-2.86	-0.03	-0.46	-0.40	0.15	-2.17	-0.74	2.61	-4.32	0.50	-0.05

Source: Eurostat Comext, SITC Rev. 4.; authors' calculations.

Euro area-17	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Food	-0.19	-0.10	-0.03	-0.05	-0.05	-0.09	-0.07	-0.05	-0.04	0.01	-0.05
Beverages and tobacco	-0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.05	0.01	-0.01	0.02
Crude materials	0.17	-0.02	-0.01	0.00	0.08	0.04	0.06	0.04	0.01	-0.13	0.39
Mineral fuels	-4.55	0.24	0.32	-0.38	-1.02	-2.74	-1.72	0.22	-3.57	4.87	-3.22
Animal and vegetable oils, facts and waxes	0.02	-0.02	-0.04	-0.01	-0.04	-0.03	-0.06	-0.01	-0.09	0.08	-0.05
Chemical products	-0.77	-0.26	-0.38	-0.12	-0.53	-0.70	-0.56	-0.41	-0.10	0.37	-0.71
Manufactured goods	2.23	-0.10	-0.25	-0.04	1.08	0.62	1.77	1.26	-0.25	-3.26	2.53
Machinery and transport equipment	0.27	0.03	-0.22	0.05	0.38	0.31	0.33	0.46	-0.10	-1.33	0.77
Miscellaneous manufactured articles	0.33	0.06	0.00	0.01	0.04	0.04	0.11	0.08	0.03	-0.10	0.09
Other unspecified goods	-0.48	0.30	0.21	-0.32	-0.04	0.99	0.00	-0.05	-0.27	-0.02	-0.05
Product effect	-2.98	0.14	-0.41	-0.87	-0.09	-1.54	-0.13	1.60	-4.38	0.48	-0.27

Source: Eurostat Comext, SITC Rev. 4.; authors' calculations.

Note: Results for Austria vis-à-vis the respective economic areas.

Table 3A

Market Effect

	2000			2001			2002			2003			2004			2005		
	World	EU	EA															
Australia	-0.03			0.07			-0.09			-0.13			-0.13			-0.09		
Belgium and Luxembourg	-0.06	-1.30	-1.76	-0.05	-0.20	-0.27	-0.12	-0.26	-0.36	-0.29	0.06	0.08	-0.35	-0.60	-0.80	-0.19	-0.68	-0.93
Brazil	-0.04			0.00			0.06			-0.01			-0.12			-0.08		
Bulgaria	0.05	0.08		0.02	0.02		0.02	0.00		0.08	0.02		0.07	0.03		0.07	0.01	
Canada	-0.37			0.24			-0.01			-0.23			-0.35			-0.33		
Chile	-0.04			0.01			0.01			-0.05			-0.06			-0.07		
China	-0.85			-0.24			-0.61			-1.25			-1.61			-0.88		
Croatia	0.01			0.13			0.18			0.36			0.19			0.14		
Czech Republic	0.27	0.70		0.31	0.41		0.74	0.13		0.13	0.13		0.71	0.48		0.34	0.19	
Cyprus	0.00	-0.01	-0.02	0.00	-0.01	-0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	-0.01	-0.02	0.00	-0.01	-0.02
Denmark	0.00	-0.15		0.00	-0.02		0.00	-0.05		-0.01	0.05		-0.02	-0.08		-0.01	-0.10	
Egypt	0.01			0.00			0.00			0.00			0.00			-0.01		
Estonia	-0.01	-0.04	-0.06	0.00	0.00	-0.01	0.00	-0.01	-0.01	0.00	-0.01	-0.01	0.00	-0.02	-0.02	0.00	-0.02	-0.03
Finland	0.00	-0.15	-0.21	0.00	0.02	0.02	0.00	0.00	0.01	0.01	-0.02	-0.03	0.00	-0.06	-0.08	-0.01	-0.10	-0.14
France	-0.04	-1.95	-2.66	0.01	0.00	0.00	-0.01	0.37	0.50	-0.07	-0.09	-0.12	-0.09	-0.52	-0.71	-0.06	-0.51	-0.70
Germany	1.56	5.32	6.58	-0.74	0.20	0.25	0.22	-1.04	-1.30	5.51	0.70	0.87	4.57	1.68	2.11	2.07	2.05	2.55
Greece	0.00	-0.19	-0.26	0.00	0.01	0.01	0.00	0.04	0.06	0.04	-0.09	-0.12	0.01	-0.04	-0.05	0.00	-0.02	-0.03
Hong Kong	-0.54			0.15			-0.08			-0.31			-0.45			-0.26		
Hungary	0.49	1.77		0.23	0.42		0.46	0.30		0.99	0.25		0.89	0.57		0.29	0.33	
India	-0.05			0.03			-0.09			-0.17			-0.27			-0.34		
Indonesia	-0.04			0.02			0.00			-0.01			-0.14			-0.10		
Ireland	-0.04	-0.44	-0.59	-0.01	-0.04	-0.05	-0.01	0.03	0.04	-0.02	0.24	0.32	-0.07	-0.06	-0.08	0.00	-0.08	-0.12
Israel	-0.05			0.03			0.00			-0.01			-0.06			-0.03		
Italy	0.38	0.37	0.35	-0.04	0.04	0.04	0.21	-0.02	-0.02	0.94	0.02	0.02	0.96	0.26	0.30	0.38	0.18	0.19
Japan	-0.99			0.38			0.15			-0.56			-0.77			-0.52		
Latvia	0.00	-0.01		0.00	-0.01		0.00	0.00		0.01	0.00		0.01	-0.01		0.00	-0.01	
Lithuania	0.00	-0.03		0.00	-0.03		-0.01	-0.02		-0.01	-0.01		0.00	-0.02		0.00	-0.05	
Luxembourg		-0.05	-0.07		-0.03	-0.04		0.01	0.01		-0.02	-0.03		-0.04	-0.06		-0.01	-0.02
Malaysia	-0.27			0.12			-0.08			-0.05			-0.28			-0.09		
Malta	0.00	-0.03	-0.05	0.00	0.02	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mexico	-0.63			0.16			0.00			-0.03			-0.32			-0.25		
Netherlands	-0.13	-1.33	-1.80	0.02	0.08	0.11	0.01	0.03	0.03	-0.14	-0.05	-0.07	-0.24	-0.56	-0.76	-0.12	-0.85	-1.17
Norway	0.00			0.01			-0.01			-0.03			-0.05			-0.03		
Poland	0.04	-0.01		0.02	0.00		0.08	0.00		0.20	0.00		0.24	-0.02		0.12	-0.01	
Portugal	0.00	-0.18	-0.25	0.00	-0.02	-0.03	0.00	0.04	0.05	-0.04	0.02	0.02	-0.08	-0.05	-0.07	0.04	-0.11	-0.15
Romania	0.11	0.15		0.10	0.09		0.10	0.05		0.27	0.09		0.35	0.23		0.24	0.27	
Russia	0.03			0.09			0.06			0.12			0.21			0.22		
Saudi Arabia	-0.02			-0.01			-0.01			-0.04			-0.05			-0.09		
Sweden	0.00	-0.35		0.00	0.15		0.01	0.00		0.01	-0.05		0.00	-0.11		-0.01	-0.15	
Switzerland	0.15			0.11			0.16			0.64			0.65			0.34		
Serbia	0.02			0.06			0.08			0.13			0.10			-0.03		
Singapore	-0.38			0.25			-0.01			-0.27			-0.45			-0.26		
Slovenia	0.01	0.29	0.36	0.01	0.06	0.08	0.12	0.04	0.05	0.44	0.10	0.13	0.48	0.32	0.41	0.23	0.34	0.43
Slovakia	0.13	0.30	0.37	0.14	0.18	0.23	0.13	0.07	0.09	0.40	0.15	0.19	0.36	0.24	0.31	0.19	0.19	0.24
Spain	0.01	-0.75	-1.06	0.00	-0.06	-0.08	0.00	-0.03	-0.05	0.03	-0.16	-0.23	-0.07	-0.43	-0.59	-0.05	-0.44	-0.62
Thailand	-0.15			0.00			-0.04			-0.16			-0.21			-0.23		
Turkey	0.01			0.04			-0.03			-0.03			-0.02			-0.04		
Ukraine	0.00			0.01			0.01			0.03			0.04			0.02		
United Kingdom	-0.09	-2.03		0.00	-0.16		-0.06	-0.02		-0.10	0.66		-0.18	-0.49		-0.10	-0.65	
U.S.A.	-2.79			0.93			-0.27			-1.18			-2.12			-1.50		
Rest of the world	-1.15			-0.10			-0.30			-0.90			-1.39			-0.90		
Market effect	-5.53	-0.04	-1.11	2.51	1.15	0.30	0.97	-0.36	-0.90	4.25	1.98	1.03	-0.12	0.70	-0.12	-1.97	-0.27	-0.51

Source: UN Comtrade, Eurostat Comext; authors' calculations.

continued Table 3A

Market Effect

	2006			2007			2008			2009			2010		
	World	EU	EA												
Australia	-0.07			-0.10			-0.13			0.10					
Belgium and Luxembourg	-0.15	-0.53	-0.72	-0.25	-0.39	-0.54	-0.23	-0.31	-0.43	0.41	1.17	1.57		-0.95	-1.27
Brazil	-0.10			-0.15			-0.20			0.14					
Bulgaria	0.08	0.07		0.09	0.13		0.09	0.04		-0.20	-0.15			0.04	
Canada	-0.25			-0.19			-0.15			0.41					
Chile	-0.04			-0.06			-0.08			0.10					
China	-1.04			-1.16			-1.05			0.64					
Croatia	0.18			0.21			0.21			-0.34					
Czech Republic	0.52	0.46		0.57	0.39		0.56	0.32		-0.74	-0.71			0.83	
Cyprus	0.00	-0.01	-0.01	0.00	-0.01	-0.02	0.00	-0.01	-0.02	0.00	0.02	0.03		-0.01	-0.01
Denmark	-0.01	-0.12		-0.01	-0.05		0.00	-0.04		-0.01	0.18			-0.09	
Egypt	0.00			-0.01			-0.03			0.02					
Estonia	0.05	0.02	0.03	0.00	-0.01	-0.02	0.00	0.01	0.01	0.00	0.04	0.05		-0.04	-0.05
Finland	-0.01	-0.13	-0.18	-0.01	-0.06	-0.09	-0.01	-0.04	-0.05	0.02	0.24	0.33		-0.13	-0.18
France	-0.05	-0.45	-0.62	-0.07	-0.44	-0.62	-0.13	-0.40	-0.55	0.16	1.20	1.62		-0.97	-1.30
Germany	4.40	3.76	4.74	3.57	1.47	1.88	3.05	1.05	1.36	-4.85	-3.81	-5.14		4.90	6.39
Greece	-0.01	-0.11	-0.15	0.00	-0.08	-0.11	0.01	-0.08	-0.11	-0.02	0.13	0.18		0.02	0.03
Hong Kong	-0.30			-0.25			-0.14			0.22					
Hungary	0.46	0.50		0.60	0.37		0.41	0.19		-0.84	-0.83			0.57	
India	-0.28			-0.26			-0.52			0.24					
Indonesia	-0.02			-0.09			-0.28			0.16					
Ireland	-0.04	-0.08	-0.11	-0.05	-0.06	-0.08	0.01	0.08	0.11	0.08	0.23	0.31		-0.01	-0.01
Israel	-0.02			-0.05			-0.04			0.05					
Italy	0.73	0.31	0.33	0.77	0.15	0.17	0.49	0.05	0.06	-1.30	-0.37	-0.50		0.33	0.40
Japan	-0.49			-0.29			-0.82			1.12					
Latvia	0.01	-0.02		0.01	-0.01		0.00	0.00		-0.01	0.04			-0.03	
Lithuania	0.00	-0.04		-0.01	-0.03		-0.01	-0.05		0.03	0.12			-0.09	
Luxembourg		-0.06	-0.08		0.02	0.02		-0.03	-0.03		0.06	0.08		-0.01	-0.01
Malaysia	-0.13			-0.10			-0.06			0.15					
Malta	0.00	-0.01	-0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01		0.00	0.00
Mexico	-0.30			-0.19			-0.17			0.40					
Netherlands	-0.19	-0.89	-1.22	-0.23	-0.54	-0.75	-0.24	-0.66	-0.90	0.33	1.40	1.88		-1.68	-2.24
Norway	-0.03			-0.04			-0.01			0.02					
Poland	0.24	0.03		0.35	0.08		0.38	0.06		-0.41	-0.12			0.14	
Portugal	-0.02	-0.15	-0.20	-0.03	-0.06	-0.09	-0.03	-0.07	-0.09	0.06	0.22	0.30		-0.11	-0.15
Romania	0.29	0.41		0.49	0.40		0.24	0.14		-0.53	-0.46			0.25	
Russia	0.33			0.41			0.27			-0.29					
Saudi Arabia	-0.05			-0.05			-0.08			0.06					
Sweden	-0.01	-0.18		-0.01	-0.14		0.00	-0.03		-0.01	0.32			-0.40	
Switzerland	0.43			0.47			0.44			-0.47					
Serbia	0.09			0.15			0.09			-0.13					
Singapore	-0.34			-0.18			-0.36			0.41					
Slovenia	0.28	0.33	0.42	0.46	0.40	0.52	0.28	0.22	0.29	-0.58	-0.59	-0.79		0.48	0.63
Slovakia	0.43	0.41	0.52	0.41	0.32	0.41	0.31	0.21	0.27	-0.37	-0.37	-0.50		0.45	0.59
Spain	-0.01	-0.44	-0.61	-0.02	-0.28	-0.39	0.00	-0.02	-0.03	0.10	0.98	1.31		-0.50	-0.67
Thailand	-0.09			-0.11			-0.22			0.25					
Turkey	-0.07			-0.09			-0.08			0.14					
Ukraine	0.03			0.08			0.08			-0.10					
United Kingdom	-0.18	-1.17		-0.05	0.39		-0.02	0.36		0.22	1.22			-1.41	
U.S.A.	-1.23			-0.54			-0.73			2.47					
Rest of the world	-1.28			-1.08			-1.26			1.49					
Market effect	1.72	1.90	2.12	2.96	1.98	0.32	-0.17	0.98	-0.14	-1.19	0.18	0.73		1.60	2.16

Source: UN Comtrade, Eurostat Comext; authors' calculations.