Developments in the exports of the four largest euro-area member states since the launch of monetary union

The current phase of economic recovery has seen German exports rise very sharply in real terms. Of the four large euro-area member states (EMU 4), only Spanish exports displayed similar momentum, while French and Italian exporters achieved considerably smaller gains. Germany's lead in terms of export growth is no new phenomenon; it was also observed in the years between the start of the third stage of monetary union and the onset of the global financial and economic crisis. This article will take a closer look at the differences in these four countries' export growth.

Germany's strong export performance had a broad regional base. Its deliveries to most of the large sales regions grew at a faster pace than those of its three partner countries. Overall, all EMU 4 countries recorded the strongest trade growth in trade with China, followed by the Commonwealth of Independent States (CIS), the Middle East and the new EU member states (NMSs). What all four countries have in common is that the percentage of exports to the euro area and other industrial countries has diminished appreciably over the past ten years.

Looking at its main determining factors, export growth can be broken down into a global trade effect, which exerts by far the largest influence; regional and competition effects; and a residual. It is evident that growth in the sales markets of all four countries was unable to match the expansion of global trade, mainly because exports are still fairly strongly biased towards the industrial countries. In addition, it should be noted that Germany's real exports were boosted by improved price competitiveness, while this factor had a negative effect for Italy and Spain, and was virtually negligible for French exports.

The residual contains, amongst other things, product range effects, although differences in the sectoral focus of goods supply explain only a fairly small part of the heterogeneity in the export growth of the EMU 4. In addition, there is some evidence to suggest that different earnings developments in manufacturing excluding construction have had a perceptible impact on the export growth of the large euro-area countries. Differences in enterprises' globalisation strategies are an additional factor. In this connection, the strong export focus of German *Mittelstand* companies is also significant. However, such factors can be determined only in qualitative terms.

Exports of the four large euro-area countries since the cyclical low of the second quarter of 2009

German and Spanish exports exceed pre-crisis levels

The degree to which euro-area member states have benefited from the revival of global trade with the global economic recovery differs fairly strongly. This can, by way of example, be demonstrated for the four major euro-area countries. By the first quarter of 2011, real exports had risen by 24½% in Germany and by 22½% in Spain from their cyclical low in the spring of 2009.[1] By contrast, France and Italy experienced much smaller gains of 15% each. The very strong growth in German exports must, all other things being equal, surely be seen as a reaction to the previous dramatic decline, when exports plummeted by 18½% from the pre-crisis cyclical peak in the first quarter of 2008 to the second quarter of 2009. However, this does not explain the differences between the four countries. The downturn was only a little weaker in France and Spain, but considerably more pronounced in Italy. Overall, in Germany and Spain, exports in the first quarter of 2011 slightly exceeded their respective pre-crisis highs, whereas exports in France and Italy were still 3½% and as much as 12½% lower respectively.

Longer-term trends in the exports of the EMU 4

Even before the crisis, German was a leading exporter …

Germany's strong export performance compared to other euro-area countries is no new phenomenon and was in evidence even before the crisis. Between the launch of the third stage of European monetary union at the beginning of 1999 and 2008, real exports in Germany expanded at an average annual rate of 7½%, compared with +4½% in Spain, +3½% in France and +2% in Italy.[2] As the numerator increased apace, while gross domestic product (GDP), as the denominator, expanded only moderately, Germany's export ratio rose from 28½% in 1998 to 47½% in 2008, while it increased only slightly in France and Italy, to 27% and 28½% respectively, and remained virtually unchanged in Spain, at 26½%.

… of both goods and services

The German export economy's growth lead was evident both in goods and services. Exports of real services in Germany even outpaced goods exports, whereas exports of services expanded less strongly in the other three countries. This was due, amongst other things, to the strong increase in German exports of transport services and business-related services, which are closely related to the cross-border trade in goods. In France and Italy, exports of services still represented a larger percentage of total exports, at 21% and 18% respectively, than in Germany (14½%), but the gap has narrowed. Spain continued to occupy the top spot with 33% on the strength of its tourism industry. However, Germany's strong export focus means that its percentage of services exports in GDP is higher than in France and Italy and just 2 percentage points lower than in Spain.

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1 Overall economic output had already bottomed out in the first quarter of 2009.
2 Looking at Spain, this comparison also demonstrates that the sharp expansion in the current account deficit in the 1999 to 2008 period can hardly be explained by weak exports. It was, in fact, due to very lively growth in imports, which was triggered by the real estate boom and the overheated consumer economy.
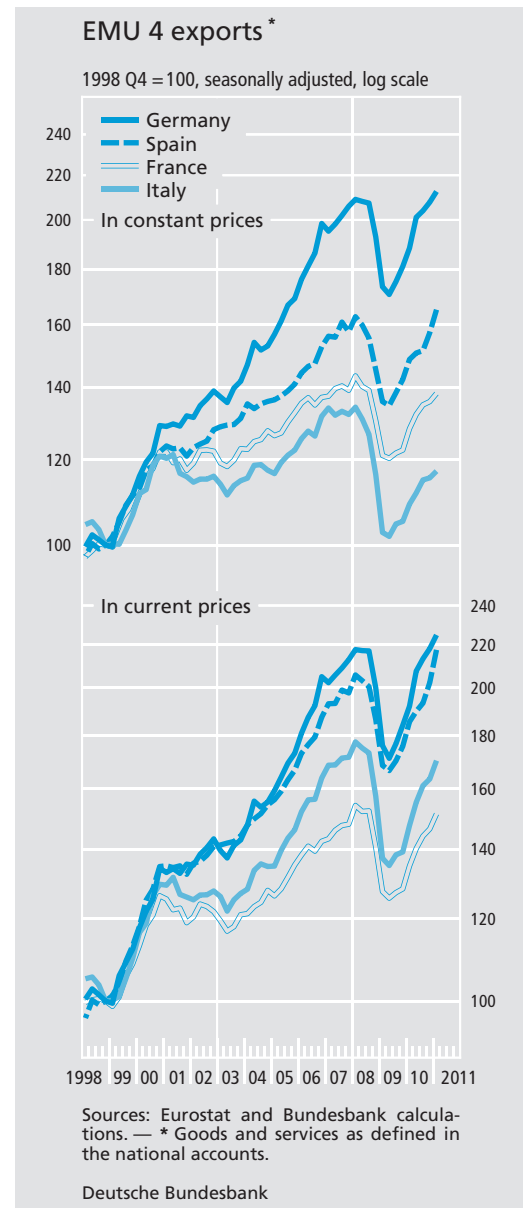
The problem of different deflation methods

A longer-term comparison of developments in real exports in the EMU 4 must also take into account differences in how the nominal series are deflated. In Germany and France, it is based on export price indices, while in Italy and Spain unit values are used in some instances.[3] The export deflators for Italy and Spain increased by 3% and 2% a year respectively between 1999 and 2010, while those for Germany and France rose by ½% each. The sharper rise in Spain and Italy is probably partly due to larger price increases. Product range and quality effects, which are not adjusted for in unit values, are an additional factor here. This distortion of unknown proportions probably helps explain why the real growth reported for Italian and Spanish exports tends to be understated and therefore deviates more to the downside from the (less distorted) German figure than the nominal measure.
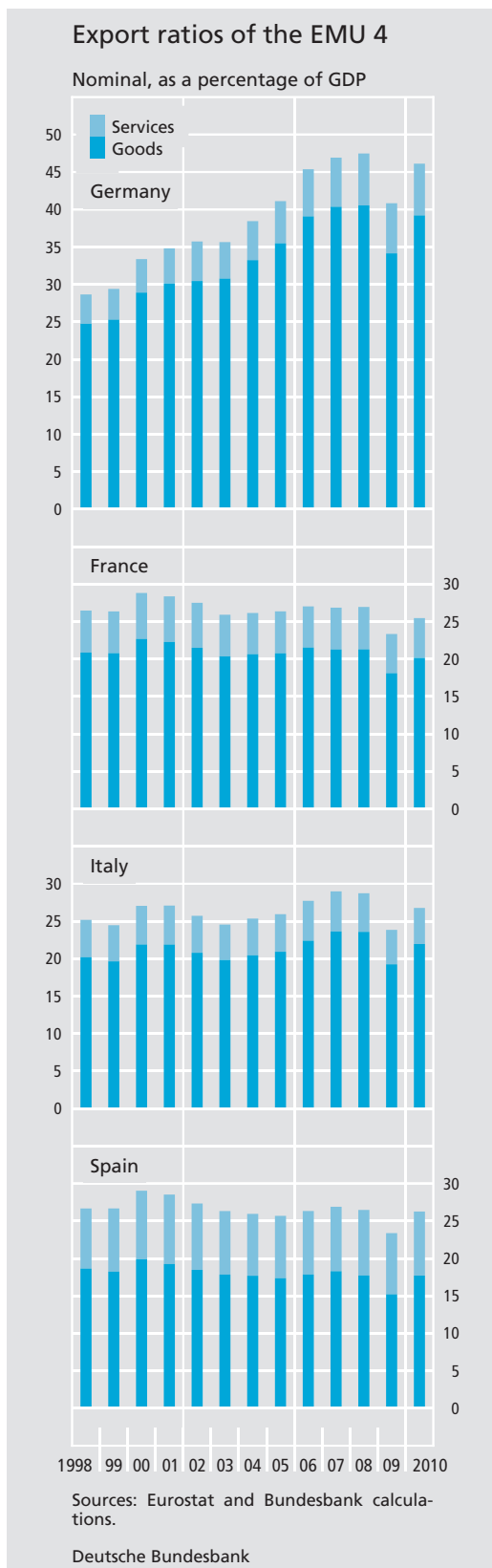
Regional breakdown of the goods exports of the EMU 4

Importance of non-euro-area markets increasing …

The strong German export growth of the past decade had a broad regional base. In value terms, Germany's deliveries to the euro area[4] – by far the most important sales market for all four countries – grew at 5% on an annual average between 1999 and 2010. While this was only slightly stronger than the corresponding exports from Spain (+4½%), they far outpaced French (+2%) and Italian deliveries (+2½%). Exports to non-euro-area countries displayed similar growth differentials, though growth momentum was much greater overall. In the entire period to 2010, the cor-

EMU 4 exports*

1998 Q4 = 100, seasonally adjusted, log scale

— Germany
--- Spain
— France
— Italy

In constant prices

In current prices

1998 99 00 01 02 03 04 05 06 07 08 09 10 2011

Sources: Eurostat and Bundesbank calculations. — * Goods and services as defined in the national accounts.

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3 Unit values show the price of exports as measured per weight unit or item. They therefore take no account of changes in the range of products or in the quality of the exported goods. In Germany and France, where both prices and unit values are available, the average annual growth rates of these unit values for the 1999 to 2010 period were 1.5 and 1.8 percentage points respectively higher than those of the export price indices. It can therefore be assumed that the unit values for Spain and Italy also overstate actual price developments.
4 Here and in the following excluding Slovenia, Slovakia and Estonia, which are still counted as new EU member states from a regional perspective.

Export ratios of the EMU 4

Nominal, as a percentage of GDP

Germany

France

Italy

Spain

1998 99 00 01 02 03 04 05 06 07 08 09 2010

Sources: Eurostat and Bundesbank calculations.

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responding German and Spanish exports increased at an average rate of 6½% a year, compared with 3% in France and 4½% in Italy. Given the relatively strong growth, the percentage of extra-euro-area trade increased across the board and that of trade within the euro area fell accordingly. In Germany's case, the weight of non-euro-area countries rose to 60½% between 1998 and 2010, compared with 52½% in France, 58% in Italy and 44½% in Spain.

In the 1999 to 2010 period, German exports to China grew faster, at an annual average of 20%, than to any other third country.[5] This dwarfed even the considerable export success of the other three countries, which ranged between 11½% (France) and 15½% (Spain). However, it should be noted that China's weight as a sales market was still too low in the pre-crisis years, even in Germany, to have a major impact on growth in overall exports. Deliveries to China have gained a perceptibly greater significance only in recent years. For instance, exports to China rose from just more than 3% of overall German deliveries in 2007 to 5½% in 2010, compared with a slight increase in Spain to 1½% and growth by 1 percentage point to 2½% in Italy and by ½ percentage point to 3% in France. The comparatively high level of German exports to China can apparently be explained in part by the fact that products made in Germany better match Chinese import needs than

… with main stimuli coming from emerging market economies

5 In this report, the term "China" refers to the People's Republic of China excluding the special administrative regions of Hong Kong and Macau. It should be noted that a percentage of the exports to Hong Kong is, in fact, destined for China. The foreign trade data therefore do not paint a full picture of deliveries to China.

those of the other three EMU countries (see box on page 20 f). Growth in the exports of all four countries to the other south and east Asian emerging market economies has lagged well behind that of business with China.

The Middle East is another fast-growing sales region. Here, German and Spanish exporters also achieved greater growth than suppliers from France and Italy. Average rates of expansion in exports from France, Italy and Germany to the new EU member states are in a fairly narrow range of 8% to 8½% for the 1999 to 2010 period; only Spain was able to expand its deliveries significantly more (+11½%). Taking into account its stronger starting position, Germany recorded by far the largest growth contributions, however. Looking at exports to the CIS, Germany ranks first, at +11%. By contrast, Latin America is the emerging market region in which the EMU 4 realised the smallest gains over the past decade.

Weak French and Italian exports to non-euro-area industrial countries

In terms of exports of goods to the old non-euro-area EU countries and the United States, the EMU 4 countries displayed considerable differences between 1999 and 2010. While German and Spanish deliveries to these countries increased perceptibly (+3½% and +3% respectively) and Italy generated slight growth, in 2010 French enterprises sold less, in value terms, than in 1998.

Regional structure of goods exports in 2010[*]
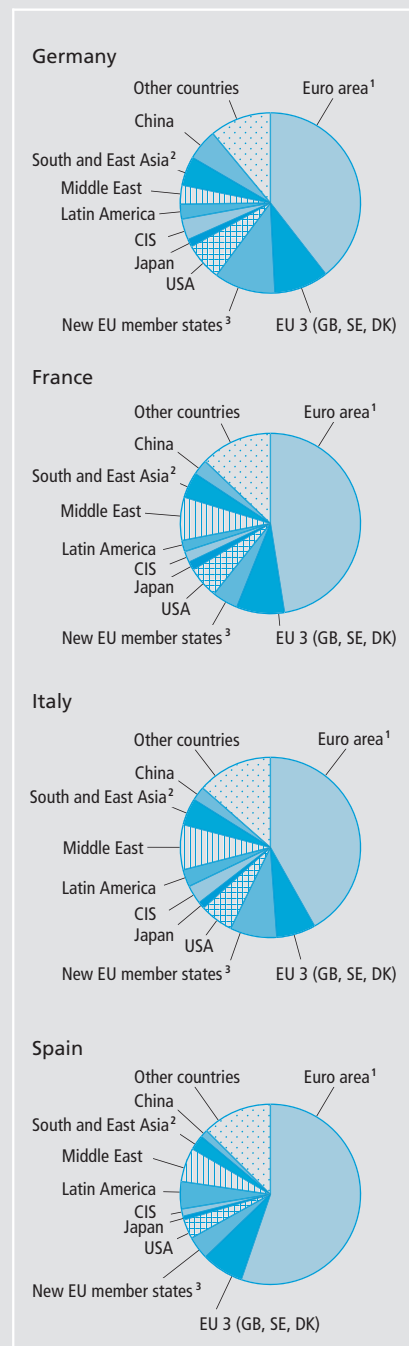
Sources: Eurostat and Bundesbank calculations. — * As a percentage of total nominal exports of goods. — **1** Excluding Estonia, Slovakia and Slovenia. — **2** Excluding China and Japan. — **3** Including Estonia, Slovakia and Slovenia.
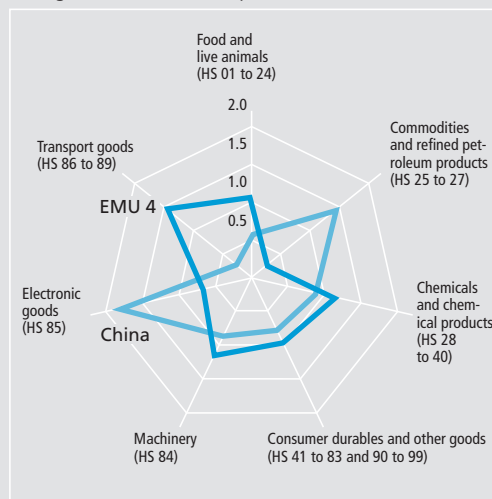
Deutsche Bundesbank

Goods exports of the four large euro-area countries to China

China's rise to a leading economic power and its increasing integration into the world economy have boosted its foreign trade with the four large euro-area countries (EMU 4). For the German economy, in particular, the Chinese sales market has gained considerably in importance. Since the start of the third stage of monetary union at the beginning of 1999, German goods exports to China have increased by 20% per year on average in nominal terms. Their share in German goods exports has thus been continuously rising and, at 5½%, China achieved seventh place in the ranking of the most important foreign buyers in 2010. Conversely, Germany is the fifth most important import country for China (excluding Hong Kong). Although exports to China from France, Italy and Spain also underwent very dynamic growth, this was not as strong as in Germany. Therefore, China's weighting in the respective total exports of goods in 2010 was significantly lower in France (3%), Italy (2½%) and Spain (1½%).

One possible explanation for the comparatively high level of German exports to China could be that the German economy's range of products better meets the Chinese demand for imported goods than that of the other three euro-area countries. The car industry provides a good example of this. Germany has benefited to a much greater extent from the booming demand for cars in China in recent years than the other three euro-area countries have. Since small and medium-sized vehicles are predominantly produced in China itself, Chinese foreign demand mainly focuses on premium vehicles, for which German car manufacturers are very well positioned in the global market.[2] Therefore, at 9½%, the share in deliveries to China as a percentage of total car exports in 2010 for Germany was much higher than for France and Spain (½% and slightly over 0%, respectively), where predominantly small and medium-sized vehicles are produced. In Italy, which is home to some smaller manufacturers of luxury vehicles, the share amounted to 2%.

In order to systematically record the influence of the range of export goods on the differences in the exportation of goods from the EMU 4 to China with regard to all product groups, we will perform several model calculations.[3] We will begin with the general export potential, calculated for a given country on the assumption that its share in total Chinese import demand will correspond to its world market share. This value is compared with a country's specific export potential vis-à-vis China, taking into account, in addition, the product-related congruence between the Chinese demand for import goods and a country's export supply. To this end, the Chinese demand for imports is broken down into around 5,000 product groups.[4] On this basis, we calculate the size of a country's total exports to China if its share of Chinese import demand for individual products corresponds with its world market share for the respective product. The specific export potential corresponds to the general export potential if the country-specific range of export goods is identical to that of world trade. The level of congruence, measured as the ratio of the two variables, would thus be one. By contrast, if the level of congruence falls below this reference value, the goods structure of the export country does not fit Chinese import demand as well as the global export supply. Conversely, if the level of

EMU 4 goods export specialisation and China's import specialisation[1]

Average over the 2007-2009 period

congruence is greater than one, this means that a country's export supply better matches Chinese import demand than the profile of world exports as a whole.

For all of the four large euro-area countries, measured in global terms, this results in a below-average congruence with Chinese import demand during the period from 2007 to 2009. This is due to the fact that the Chinese import demand largely focuses on commodities and electronic goods, both of which play only a minor role in the range of products of the EMU 4 countries. It is therefore not surprising that South Korea and Japan, owing to their strong position in the electronic goods market, and Australia, as a supplier of commodities, have – measured in such terms – an above-average level of congruence with Chinese import demand. With regard to the range of products, with a congruence level of around one, the export supply of the United States also matches Chinese demand more closely than the large euro-area countries do.
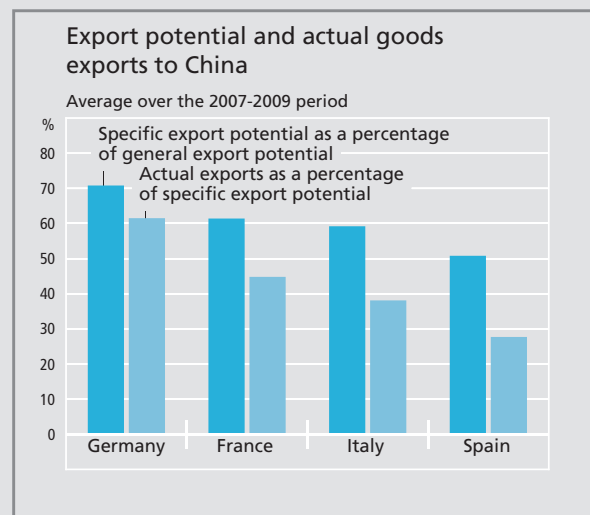
There are nevertheless clear differences between the EMU 4 countries. The negative effect, measured as the relative deviation between the general and the specific export potential is, at just over one-quarter, significantly lower for Germany than for the other three large euro-area countries. According to this calculation, Spain comes last with a gap of -50%. The result implies that Spanish exports to China would be two-fifths higher if its range of export goods corresponded to the German range. France and Italy could export, respectively, one-sixth or one-fifth more goods to China. As shown by a further calculation, Germany's comparative advantage is due not least to its specialisation in the mechanical engineering and vehicle manufacturing sectors, for which there is a significantly higher level of congruence with the specific Chinese demand.

We now compare the export potential of a trade partner, calculated using the product-related world market shares, with the actual export value. It becomes evident that all of the EMU 4 countries lagged behind their specific potential on an average for the years 2007 to 2009. The share of the four countries as a whole in Chinese imports was 50% lower than would have been expected according to their

potential. One important reason for this is undoubtedly the large geographical distance and the consequently high transport costs.[5] This is supported by the fact that economies in geographical proximity to China ranked particularly high. In addition to the lower transport costs, closer cultural ties could also play an important role.

However, it is once again clear that there are pronounced differences between the EMU 4 countries. At two-fifths, Germany has the lowest shortfall between actual exports and its specific export potential; Spain has the highest shortfall at just under three-quarters. As geographical distance cannot be considered as an explanatory factor for the differences, it is likely that other factors played a role. One possible cause could be that German exporters entered the Chinese market earlier than their European competitors and are now reaping the benefits.

Overall, the analysis suggests that German exports to China performed better than those of its euro-area partner countries partly as a result of the greater congruence of the German range of export goods. Furthermore, Germany was able to exploit this higher specific export potential better than the other three large euro-area countries.

Export potential and actual goods exports to China

Average over the 2007-2009 period

Specific export potential as a percentage of general export potential

Actual exports as a percentage of specific export potential

Developments in exports by region and group of goods

Average annual percentage growth
in nominal exports of goods, 1999 to 2010

Item	DE	FR	IT	ES
Region				
Euro area [1]	4.9	2.2	2.4	4.5
EU 3 (GB, SE, DK)	3.6	− 0.2	1.4	2.7
New EU member states [2]	8.6	8.0	7.9	11.5
USA	3.0	0.1	0.6	3.7
Japan	2.8	2.9	0.9	3.6
CIS	10.8	10.2	9.1	10.3
Latin America	5.3	3.2	1.6	3.8
Middle East	8.8	5.6	7.7	8.8
South and East Asia (excl China and Japan)	7.2	4.6	5.5	8.2
China	19.9	11.3	13.7	15.4
Other countries	6.0	2.7	5.1	8.3
Group of goods				
Intermediate goods	5.7	2.8	4.5	6.3
Capital goods (excl passenger cars)	5.0	0.9	2.8	3.2
Passenger cars	5.0	− 0.7	0.5	2.5
Consumer goods	7.5	4.1	3.0	5.6
Other	8.7	28.8	5.1	6.4

Sources: Eurostat and Bundesbank calculations. — **1** Excluding Estonia, Slovakia and Slovenia. — **2** Including Estonia, Slovakia and Slovenia.

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Sectoral export developments of the EMU 4

Intermediate goods make up large percentage of exports in all major euro-area countries

The structure of EMU 4 goods exports is very similar in that intermediate goods (as defined for the classification of goods by Broad Economic Categories) represented roughly half of the nominal exports of goods in 2010. These mainly comprised industrially manufactured intermediate goods, including parts and accessories for capital goods, and transport equipment. At the current end, however, cyclical factors must also be considered. In the first recovery phase, which lasted into 2010, for instance, there was increased stockbuilding, which boosted demand especially for intermediate products. By contrast, capital goods (excluding passenger cars) took a back seat during this stage of the recovery process.

In 2010, exports of these goods were therefore between 7% (France) and 13% (Italy) below their 2008 levels. In all four countries, the importance of capital goods was smaller in 2010 than in 1998. However, the exceptionally weak performance of French manufacturers meant that the percentage of investment goods in French exports had already fallen by 6 percentage points between 1998 and 2008, while their weight in German and Italian exports has declined only since the onset of the crisis. The ratios were fairly similar in Germany, France and Italy in 2010, with figures of between 17½% (Italy) and 20% (Germany), whereas in Spain, capital goods represented only 10% of total goods exports.

Germany also leading in terms of growth in consumer goods exports

Throughout the 1999 to 2010 period, Germany achieved the highest rates of growth in almost all sectors; only Spain posted more pronounced gains for intermediate goods (+6½%). The sharp increase in German exports of consumer goods (+7½%) is also noteworthy. Nonetheless, their share in total exports of goods was much lower in 2010, at 16½%, than in the other three countries, partly because this category includes processed and unprocessed food, which is a more important export product there.

Stark contrasts in exports of passenger cars

Diverging trends can be observed particularly for exports of passenger cars (excluding vehicle parts). Between 1999 and 2010, German and Spanish auto exports increased by an average of 5% and 2½% a year, respectively. In Italy, by contrast, they rose only ½%, and in France they even fell by ½%. In this context, it should be borne in mind that Germany's partner countries produce mainly small cars and

cars in the lower mid-sized class for the European markets,[6] whereas vehicles in the upper mid-sized and luxury class make up a much larger percentage of German exports of passenger cars. Italian manufacturers are also active in this area of the market, but unit sales are relatively low. Sales in the high-end segment benefited considerably from dynamic growth in non-EU markets over the past decade. Thus, the wealthy clientele, who have a marked preference for imported luxury cars, have expanded sharply in the emerging market economies (EMEs). There is also lively demand in those countries for smaller vehicles, but this is largely met by domestic production (for more details on passenger car exports to China, see box on pages 20-21).

Main determinants of export developments in the EMU 4

Key determinants of export growth

One of the main determinants of a country's exports is growth in global trade and relative price competitiveness. To what extent the stimuli exerted by global demand can be exploited is determined, first, by the regional structure of import demand and, second, by the bias of a country's export industry. In addition, a series of other factors play a role in this context, such as differences in product range and in enterprises' globalisation strategies.

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6 In 2010, the percentage of passenger car exports to the EMU 14 countries (excluding the new member states) and the EU 3 (UK, Sweden and Denmark) was 84½% for Spain, 77½% for France, 65% for Italy but just 47% for Germany.

Sectoral structure of goods exports in 2010*
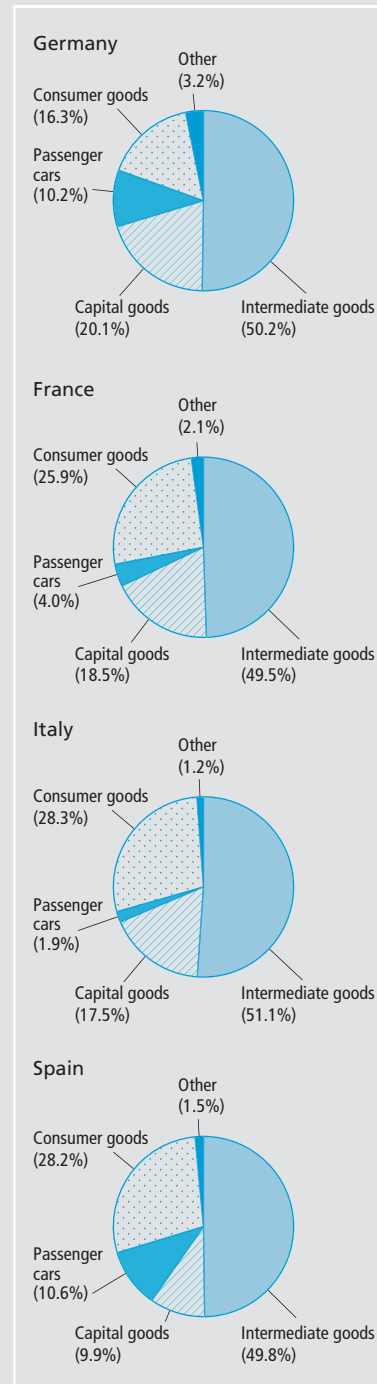
Germany
- Other (3.2%)
- Consumer goods (16.3%)
- Passenger cars (10.2%)
- Capital goods (20.1%)
- Intermediate goods (50.2%)

France
- Other (2.1%)
- Consumer goods (25.9%)
- Passenger cars (4.0%)
- Capital goods (18.5%)
- Intermediate goods (49.5%)

Italy
- Other (1.2%)
- Consumer goods (28.3%)
- Passenger cars (1.9%)
- Capital goods (17.5%)
- Intermediate goods (51.1%)

Spain
- Other (1.5%)
- Consumer goods (28.2%)
- Passenger cars (10.6%)
- Capital goods (9.9%)
- Intermediate goods (49.8%)

Sources: Eurostat and Bundesbank calculations. — * As a percentage of total nominal exports of goods.

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In a simple statistical analysis, real growth in the goods exports of the four countries under observation can be broken down into a global trade effect, a regional effect, a competition effect and other effects. The global trade effect represents global import growth minus the imports of the export country under review, in other words, the exogenous stimulus exerted by the global economy. The regional effect refers to the deviation in the growth of the export markets of a country from that of global trade (after subtracting the imports of the country in question). A positive (negative) deviation can be interpreted as meaning that exporters had a stronger position in regions with above (below)-average import momentum. Growth in the sales markets is calculated based on Dutch Centraal Planbureau (CPB) estimates of real import developments in seven regions of the world. Based on the IMF's Directions of Trade Statistics, these were weighted using these regions' respective share in exports. Discrepancies between the growth of sales markets and that of the respective country's exports indicate market share gains or losses on the sales markets; they can be attributed to changes in price competitiveness and other effects. The latter reflect any deviations of export growth from export market growth that cannot be explained by competition effects. For the purposes of this statistical analysis, they will initially be treated as a residual, but will be examined in more detail in the following. Other effects reflect, first, the influence of the different range of products on offer from the four countries' exporters. A consistent and distinct measurement of the product range effect is impossible because there are no real

data, broken down by group of goods, across all countries. Second, this metric includes the effects of all other conceivable determinants of exports, which are usually difficult to measure. This measure also reflects statistical distortions, for instance as a result of the different deflation methods mentioned above.

Changes in an economy's price competitiveness cause substitution processes among foreign buyers. When an exporter's prices rise perceptibly, demand generally shifts towards suppliers whose prices have risen more slowly. Various indicators are used to measure price competitiveness; they often coincide only in trend terms.[7] This article uses total sales deflators,[8] which reflect price developments in the entire economy and therefore the relative price of potential export (or import) goods.

Diverging price competitiveness

The size of the competition effect is determined by the price elasticity of demand in terms of price competitiveness and the extent of relative price changes. According to an econometric analysis of the four euro-area member states under review, the sensitivity of export growth to changes in this price ratio is assumed to be 0.4 for the period since the

7 See T Bayoumi, R Harmsen and J Turunen (2011), Euro Area Export Performance and Competitiveness, IMF Working Paper WP 11/140.
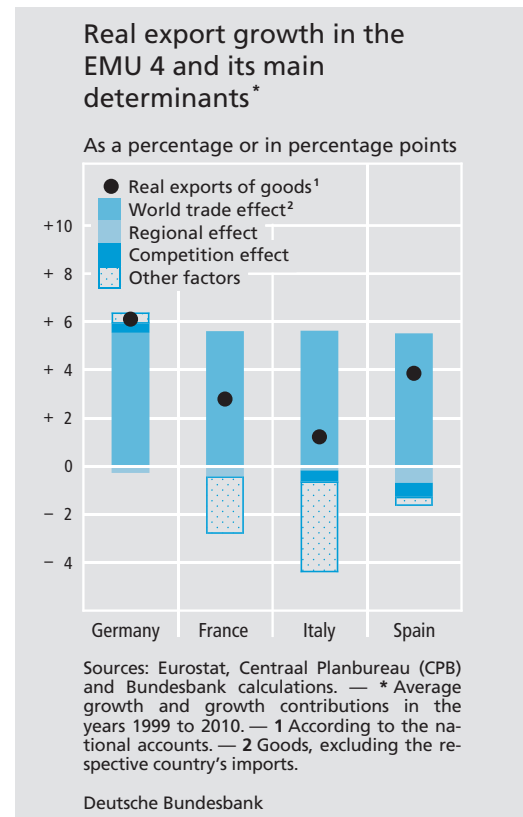**8** See Deutsche Bundesbank, The indicator quality of different definitions of the real external value of the Deutsche Mark, Monthly Report, November 1998, pp 39-52.

launch of monetary union.[9] In this period, price competitiveness – as measured against 24 industrial countries based on total sales deflators – has improved considerably in Germany (+10½%) and moderately in France (+1%), while it has deteriorated sharply in Italy (-13½%) and Spain (-18%).

These diverging trends can be explained, first, by different trends in wage cost pressure. If alternatively one looks at the real exchange rate based on overall unit labour costs, the French economy became slightly less competitive in the period under observation. In Italy, the deterioration was even worse than suggested by the indicator determined using total sales deflators. By contrast, real exchange rates based on unit labour costs suggest a more marked improvement in price competitiveness for Germany and a moderate deterioration for Spain. Second, cost-cutting through increased sourcing of intermediate goods from low-wage countries may make itself felt in price competitiveness on the basis of total sales deflators, but not in the measure based on unit labour cost. Different trends for these two indicators are reflected in shifting profit margins, which will be discussed in greater detail below.

Global trade as main driving force

The chart on this page shows the influence of the global trade effect, the regional effect, the competition effect and other effects on growth in the real exports of the four large euro-area countries. In all four countries, growth in exports during the 1999 to 2010 period was driven mainly by rising global demand (after deducting the respective country's imports).[10] As the global trade

Real export growth in the EMU 4 and its main determinants*

As a percentage or in percentage points

● Real exports of goods[1]
World trade effect[2]
Regional effect
Competition effect
Other factors

Sources: Eurostat, Centraal Planbureau (CPB) and Bundesbank calculations. — * Average growth and growth contributions in the years 1999 to 2010. — 1 According to the national accounts. — 2 Goods, excluding the respective country's imports.

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effect differs only marginally among the EMU 4 countries given the relatively small

9 This coefficient was determined in a panel estimate (fixed effects) for the four countries under investigation; the effect of growth in the sales markets was restricted to 1. The estimate was made using quarter-on-quarter growth rates for the period since the launch of monetary union. The estimated elasticity lies within the range of the figures calculated by T Bayoumi et al (2011), Euro Area Export Performance and Competitiveness, loc cit. However, the coefficients based on single regressions over extended periods of time, particularly for estimates based on export levels and price competitiveness rather than their growth rates, may differ considerably from this figure for the individual countries. See B Pluyaud, Modelling Imports and Exports of Goods in France, Distinguishing Between Intra and Extra Euro Area Trade; and K Stahn, Has the Impact of Key Determinants of German Exports Changed?, both in: O de Bandt, H Herrmann and G Parigi (eds) (2006), Convergence or Divergence in Europe?, Heidelberg, Berlin and New York; IMF (2005), France, Germany, Italy, and Spain: Explaining Differences in External Sector Performance Among Large Euro Area Countries, Country Report No 05/40; European Commission (2010), Differences in Member States' export performance, Quarterly Report on the Euro Area I/2010, pp 23-27. **10** A separate analysis of the 1999 to 2008 period, ie excluding the recession and subsequent recovery, yields very similar results.

weight of deducted imports, this does not explain the considerable differences in export performance.

Negative regional effect

The regional effect was negative for all countries over the past decade, as EMU 4 exports are still relatively heavily biased towards the slower-growing sales markets in the euro area and other industrial countries. At the same time, it is also evident that the strength of the response of exporters in the four countries to the regional shift in the growth markets has differed. The negative regional effect was comparatively small in Germany as well as Italy at just under ¼ percentage point. In France and Spain, by contrast, the regional component lowered export growth by ½ percentage point and ¾ percentage point respectively. Ultimately, however, the regional effect explains only a comparatively small part of the heterogeneity of real export growth.

Appreciable competition effect and large residual

The considerable discrepancy between the growth of the respective sales markets and that of the four countries' exports means that exporters in the EMU 4 exploit opportunities arising on their sales markets to different degrees, which can be attributed to price and other factors. For instance, looking at the average for the years 1999 to 2010, growth of Spanish exports was 1 percentage point, that in French exports 2½ percentage points and that of Italian exports 4½ percentage points lower than growth of the sales markets would have suggested. In Germany, by contrast, exports expanded by ¾ percentage point more than would have been anticipated. Based on this analysis, the improvement in price competitiveness lifted German export growth by

¼ percentage point, while its deterioration dragged export growth in Spain and Italy down by ½ percentage point in both instances. In France, the competition effect was virtually negligible. Like the regional effect, the competition effect – as measured based on total sales deflators – therefore also explains only a relatively small proportion of the differences in export developments. Thus, other effects are thought to make negative contributions of 2½ and 3¾ percentage points respectively in the case of France and Italy, but just ½ percentage point for Spain. The corresponding figure for Germany is +½ percentage point, however. These effects will be analysed in more detail below (see also box on pages 32-33).

Significance of the product range effect

Defining the product range effect

The sectoral structure of exports in the EMU 4 countries was not explicitly factored into the preceding cause-and-effect analysis. Where growth in global import demand has a specific sector composition, which is more (or less) in line with a country's export supply, the country will receive more (or less) stimuli from global trade, regardless of its price competitiveness. It should be noted, however, that the range of products that a country's export industry offers is often only inadequately described by the standard statistical goods classifications. In the business world, factors that help differentiate between products are also relevant but statistically difficult to quantify, such as product quality, reliability and accessibility of customer service, a brand's prestige or the manufacturer's reputation.

Slightly negative product range effect in EMU 4

In order to examine whether the product range effect in the narrower sense, in other words excluding the above-mentioned other factors, had a major impact on the performance of the goods exports of the EMU 4 over the past ten years, we calculate what average nominal export growth the EMU countries would have achieved in the years 1999 to 2009 had they participated fully in the growth of global trade in individual groups of goods based on their respective product-specific global market shares in 1998.[11] The groups of goods were defined based on the 67 divisions (two-digit codes) of the Standard International Trade Classification (SITC). The analysis is conducted at the nominal level, as the data needed for a real calculation – which would, in principle, be preferable – are not available, as mentioned above. Moreover, an analysis over an extended period, as is the case here, would have to take into account the fact that the range of export goods is likely to be adjusted to demand over time.

It becomes evident that in all four euro-area countries the potential export growth calculated in this manner has lagged growth in global trade as a result of their sectoral export structure. The negative effect is due, amongst other things, to the fact that global trade in commodities, in which the EMU 4 are virtually not involved, has expanded disproportionately sharply partly because of China's rapid industrialisation and fast-rising prices for these products. For Germany and France, the shortfall as compared to average growth in nominal world trade (8% on a US dollar basis) is ½ percentage point on average for 1999 to 2009, but slightly larger for Italy and Spain,

Effect of sectoral export structure*

Sources: UN Comtrade and Bundesbank calculations. — * Based on goods trade in nominal terms (US dollar basis). Average of the years 1999 to 2009. — 1 Theoretical figure assuming constant global market shares of 1998 in 67 groups of goods (two-digit SITC classifications).

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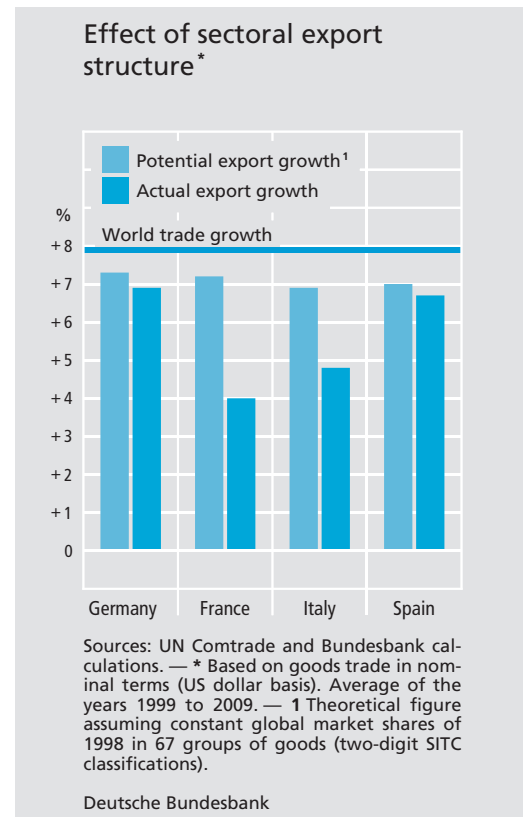
at 1 percentage point.[12] Overall, the calculation therefore suggests that the clearly weaker growth in French and Italian exports, in value terms, cannot be explained by the sectoral focus of its goods supply in the case of France and only to a small degree in the case of Italy. The main reason for growth differentials was, in fact, that both countries have lost global market share in many sectors of industry over the past ten years, whereas German – and Spanish – enterprises were frequently able to

[11] The data, available only up to 2009, were taken from the United Nations Commodity Trade Statistics Database (UN Comtrade).
[12] The low relevance of product range differences between Germany and France is confirmed by H Boulhol and L Maillard, Analyse descriptive du décrochage récent des exportations françaises, in: P Artus and F L Fontagné (2006), Évolution récente du commerce extérieur français, Rapport pour le Conceil d'Analyse Économique; Coe-Rexecode (2011), La compétitivité française en 2011, Document de travail No 22.

Sector-specific global market shares in goods trade in the EMU 4 in the years 1998 and 2009*

Germany

Percentage shares in 2009

Road vehicles
Machinery specialised for particular industries
General industrial machinery and equipment
Power-generating machinery
Medicinal and pharmaceutical products
Other transport equipment
Manufactures of metals
Professional, scientific and controlling instruments
Misc manufactured articles
Electrical machinery and apparatus

Percentage shares in 1998

France

Percentage shares in 2009

Essential oils and perfumes
Other transport equipment
General industrial machinery and equipment
Medicinal and pharmaceutical products
Power-generating machinery
Misc manufactured articles
Road vehicles
Iron and steel
Electrical machinery and apparatus

Percentage shares in 1998

Scale enlarged

Italy

Percentage shares in 2009

General industrial machinery and equipment
Machinery specialised for particular industries
Manufactures of metals
Articles of apparel
Iron and steel
Power-generating machinery
Medicinal and pharmaceutical products
Misc manufactured articles
Road vehicles
Electrical machinery and apparatus
Petroleum, petroleum products

Percentage shares in 1998

Spain

Percentage shares in 2009

Vegetables and fruit
Road vehicles
Medicinal and pharmaceutical products
Articles of apparel
Iron and steel
General industrial machinery and equipment
Electrical machinery and apparatus
Petroleum, petroleum products

Percentage shares in 1998

Sources: UN Comtrade and Bundesbank calculations. — * The selected sectors are defined as for SITC two-digit classifications. The circles represent the sector's percentage share of total exports in 2009. Where the circle lies above (below) the diagonal line, the country gained (lost) world market share between 1998 and 2009.

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maintain or even expand their market position.

Strength of competition pressure from China varies

In this context, it is, however, also important to determine whether the intensity of competition on the international product markets in which the individual countries' enterprises have specialised is high or increasing, potentially making it more difficult for enterprises to hold on to their global market share. China especially has in recent years upped the competitive pressure on foreign competitors in many sectors and considerably expanded its position. This article will go on to examine whether any one of the EMU 4 countries was particularly exposed to competition with China as a result of its sectoral export structure and whether a country's range of exports could have had a dampening effect on export trends for this reason. China's aggregate global market share across the individual sectors, weighted by the relevant sector's percentage in the total exports of China's competitor country, shall serve as an indicator of the extent to which an economy's export sector competes with China. The year 1998 was selected as the base year for the sector's share in total exports, while the year 2009 was used as the base year for China's global market shares. For Germany, an analysis based on SITC two-digit classifications shows a mean (weighted) global market share of 10% for China across all sectors. Whereas the corresponding market shares for France (10½%) and Spain (10%) are in the same magnitude, the figure for Italy is appreciably higher (13½%).[13] This is an indication that the stronger competitive pressure from China could be a reason for Italy's comparatively weak export performance. In the case of France, the argument appears to have no explanatory power, however.

Diverging earnings growth

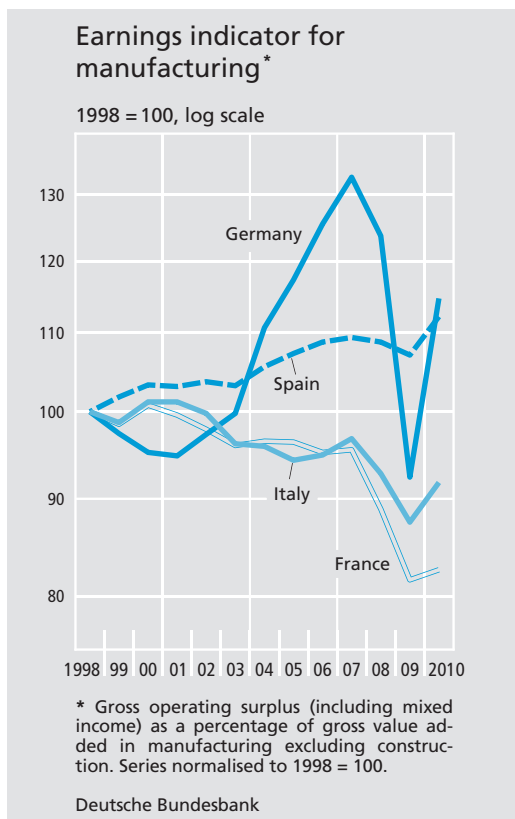*The influence of changes in profit margins on export growth*

The other effects also capture the impact of changes in profit margins on export growth. It has already been pointed out that changes in wage costs are not always fully passed through to buyers and that some of them feed into the profit margin instead. This ultimately applies to all types of cost. Such changes in profit margins are also reflected in macroeconomic indicators such as gross operating surplus as a percentage of gross value added.[14] In Germany, this earnings indicator rose sharply from 29½% to 36½% in manufacturing excluding construction for the 1999 to 2008 period. The cost advantages as a result of wage moderation and the increased sourcing of intermediate goods from low-wage countries were apparently also used to boost profit margins.[15] This in turn is likely to have been an incentive for enterprises to fur-

13 Another study compares the percentage of sectors in which China and its competitor country have an export specialisation. It found that Spain had the largest export overlap with China of the EMU 4 countries in the 2005 to 2008 period (see F di Mauro, K Forster and A Lima (2010), The global downturn and its effect on euro area exports and competitiveness, ECB Occasional Paper Series, No 119, p 22).
14 The ratio is not a profit ratio in the narrower sense, as depreciation is contained in both the numerator and the denominator.
15 For Germany, this finding is backed by data from the corporate balance sheet statistics, which show that enterprises' gross return on sales rose by almost 2 percentage points from its low in 2003 to its historic high of 5¼% in 2007. The subsequent decline can be attributed to the economic slowdown and is consequently probably only temporary (see Deutsche Bundesbank, German enterprises' profitability and financing in 2009, Monthly Report, December 2010, p 33).

Earnings indicator for manufacturing*

1998 = 100, log scale

* Gross operating surplus (including mixed income) as a percentage of gross value added in manufacturing excluding construction. Series normalised to 1998 = 100.

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ther increase their export activities, for instance by redoubling their efforts to expand their market position and open up new markets. While this metric fell especially sharply in Germany in the recession year of 2009, it increased appreciably again in 2010. Export enterprises' investment activity is therefore unlikely to have been permanently weakened.

In Spain, the earnings indicator also rose between 1998 and 2010. Given large wage increases there, this was achieved partly by significantly raising prices, which has, however, reduced price competitiveness. Meanwhile, this metric fell considerably in the French and Italian manufacturing sector. In both countries, higher costs have apparently been absorbed to a greater extent by lowering profit margins. This likely meant that yields in the

export industry dropped and that production of export goods became less profitable.[16] Overall, that suggests that cost increases (or reductions) that are not passed through to export prices may also weigh on (or support) export developments in the medium and long term.

Different globalisation strategies

The main drivers of international trade in the past two decades include increasing vertical specialisation in production, which has resulted in a pronounced expansion of cross-border supply chains.[17] In this context, it should also be borne in mind that splitting up production chains tends to boost export growth.[18] According to calculations which are based on the input-output data of the national accounts, the percentage of imported intermediate goods in the production of export goods in Germany rose by 11½ percentage points to 31½% between 1991 and 2007.[19] In the other three countries, the im-

Increased sourcing of intermediate goods from abroad as stimulus for export growth

16 See Coe-Rexecode (2011), Mettre un terme à la divergence de compétitivité entre la France et l'Allemagne, pp 165 ff; A Kabundi and F N De Simone (2009), Recent French Export Performance: Is There a Competitiveness Problem?, IMF Working Paper WP/09/2.
17 See D Hummels, J Ishii and J Kei-Mu Yi (2001), The nature and growth of vertical specialization in world trade, in: Journal of International Economics 54(1), pp 75 ff.
18 See A Maurer and C Degain (2010), Globalization and trade flows: what you see is not what you get!, WTO Staff Working Paper ERSD-2012-12.
19 If exports of goods of foreign origin from pure trading activity (re-exports) are taken into consideration alongside intermediate goods imported directly and indirectly for the production of export goods, the import content reached a figure of just over 42% in 2007 (see the economic research institutes' spring 2011 joint assessment, Aufschwung setzt sich fort – Europäische Schuldenkrise noch ungelöst, April, p 61).

Diverging globalisation strategies in Germany and France …

port content is also likely to have risen, though no comparable data are available.[20]

Increased sourcing of intermediate goods from abroad (outsourcing) is not the only strategy to lower costs. Another is to transfer the entire production or finishing to low-wage countries (offshoring).[21] In the past two decades, Germany's manufacturing sector has significantly expanded the sourcing of parts from abroad. By contrast, French enterprises appear to have preferred to establish and acquire capacity to produce final products abroad.[22] The fact that Germany had at its disposal more of the capacity needed to expand exports than France, as domestic demand growth has, at times, been weak over the past decade may also have been a factor.

… as exemplified by the automobile industry

Such differences in globalisation strategy can be demonstrated using the automobile industry as an example. By buying low-cost parts, preferentially from neighbouring central and east European countries, German manufacturers have managed to continue to carry out most final vehicle assembly domestically and still make a profit. The French auto industry, by contrast, appears to have been less active in establishing supply chains with enterprises in the central and east European countries. Instead, it has tended to set up final assembly plants at foreign locations, which also process parts produced by French factories, however. Moreover, one French manufacturer has promoted globalisation by allying itself with a large non-European car manufacturer. The Spanish automobile sector is like its German counterpart in that a relatively large share of parts are sourced from abroad. This is partly

because all auto plants in Spain belong to the production network of large international groups. The weak export performance of the Italian auto industry over the past decade is likely related to the structural crisis at the country's largest manufacturer, which it has probably overcome now, at least in part. With the takeover of a US car producer, it launched a globalisation offensive in recent years whose focus is similar to the French strategy.

Another German particularity which may help explain the strong export performance even though its influence is difficult to quantify is the large number of *Mittelstand* companies, which occupy relatively small market niches, particularly in mechanical engineering, and are frequently world market leaders in their field. Breaking down exports by the 5,030 categories of the Harmonized Commodity Description and Coding System (HS six-digit codes), Germany was represented in more than 84% of these categories in 2009, based on the criterion of a global market share of at least ½%. For France, the percentage was 76%, for Italy 74% and for Spain 65%. At the same time, Germany's global market share

German Mittelstand with strong export focus

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20 According to OECD data, the import content of goods exports for Germany in 2005 was, at 28%, higher than for France (26%), but lower than for Italy (29%) and for Spain (33%) (see OECD (2009), Vertical Specialisation and Global Value Chains, Working Party on International Trade in Goods and Trade in Services Statistics, Annex, p 2). In a Banca d'Italia staff paper, slightly higher import content ratios for 2000 are given for Germany and Italy and considerably higher ones for Spain, while the figure for France is below that for the OECD as a whole (see E Breda, R Cappariello and R Zizza (2008), Vertical Specialisation in Europe: Evidence from the Import Content of Exports, Working Paper, pp 16 f).
21 See K B Olsen (2006), Productivity Impacts of Offshoring and Outsourcing: A Review, STI Working Paper 2006/1.
22 See R Kierzenkowski (2009), The Challenge of Restoring French Competitiveness, OECD Economics Department Working Papers No 720, p 5.

Determinants of euro-area exports – results of econometric estimations

To supplement the statistical analysis of export growth components in the EMU 4 explained in detail in the main text, we estimated export functions for a panel of countries based on the elasticities approach. We assume that the change in export volumes depends on growth in real demand on the sales markets (RD) and movements in the real exchange rate (RER) as an indicator of price competitiveness. Given that these traditional determinants explain only part of the heterogeneity in the euro-area countries' export growth, we also look at the impact of other macroeconomic factors. The estimating equation thus also contains variables that aim to reflect the influence of various other effects (OE).

$X = f(RD, RER, OE)$[1]

Based on the panel approach used here, the estimated coefficients are the same for all of the countries in the analysis. Differences in export growth arise from the heterogeneity of the explanatory variables, a country-specific constant and the country-specific residual (other effects). While in the main text (pages 23 to 26) differences are explained by the rate of change in weighted demand on the sales markets, shifts in price competitiveness and a residual, in this analysis the effect of growth in the sales markets on exports is calculated econometrically and can differ from one. Therefore, the main focus of the study is not what caused the market share to change but the factors that can generally determine the heterogeneity of euro-area countries' export developments.

Real goods exports, as defined in the national accounts, are the response variable. We approximate demand on the sales markets using weighted (real) import demand in the United States, Japan, the euro area, Asian emerging economies, Latin American emerging economies, the Middle East and North Africa, as well as Central and Eastern Europe. The data on imports are taken from the World Trade Monitor, which is published by the Dutch economic research institute Centraal Planbureau (CPB), and the shares in exports are from the IMF's Direction of Trade Statistics. Real exchange rates vis-à-vis 24 partner countries are calculated using deflators of total sales.

The analysis also takes account of the following other effects: (i) the degree of outsourcing, approximated using the share of intermediate goods imports (excluding oil) in total gross value added, (ii) the relative performance of industry compared with the market services sectors and construction, measured by their relative profitability (ratio of the respective share in gross operating surplus to

gross value added as defined in the national accounts). The purpose of this is to discover to what extent disparities in domestic demand have led to differing concentrations of production capacity in the services sectors and construction. In addition, the analysis looks at (iii) the effect of profitability in the production sector excluding construction. We approximate profitability using the share of the gross operating surplus in gross value added for the production sector excluding construction as an earnings indicator. In doing this, we aim to take account of the fact that the real exchange rate selected in this analysis merely reflects price competitiveness; it does not show how the profitability of domestic production facilities has evolved in this price setting. However, profitability also affects supply. If rising wage cost pressure is not passed through to prices, it influences export activity via the supply channel. Furthermore, we calculate (iv) the impact of innovation (measured by per-capita expenditure on research and development in euro) and (v) the importance of high-technology sectors. The share of chemical industry (including the pharmaceutical industry) and manufacture of office machinery and equipment, computers, electrical engineering and optical and precision equipment in domestic value added feeds into the estimations.

The panel comprises ten countries (Germany, France, Italy, Spain, the Netherlands, Greece, Ireland, Portugal, Finland and Austria). Belgium and Luxembourg are not included because of insufficient data, while Slovenia, Malta, Cyprus, Slovakia and Estonia are left out because they joined the euro area relatively recently. We perform the estimations using seasonally adjusted quarterly growth rates for the period beginning in the first quarter of 2000. The shares of intermediate goods imports in value added and the profitability ratios are included in differentials, and the share of high-technology sectors in value added is included as a ratio. The fact that the estimations cover a relatively short period of time is due both to data constraints in some member states and our desire to restrict the analysis to the period following the launch of monetary union. This means that the main focus is on short-term elasticities; the coefficients cannot be compared one-to-one with estimated elasticities in long-term models. We carry out the estimations using the panel fixed effects approach with cluster-robust standard errors.

Estimating the baseline relationship in the period up to the second quarter of 2008 produces statistically significant coefficients for the impact of both demand and

1 This approach was recently used to estimate export functions for the euro area in T Bayoumi et al (2011), Euro Area Export Perform-
ance and Competitiveness, IMF Working Paper 11/140. — **2** *: Significant at the 5% level. — **3** Share of gross operating surplus and mixed

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price competitiveness, each with the expected sign (+/-). The parameter in front of the demand variable is discernibly less than one, meaning that the euro-area countries do not usually fully exploit the potential created by import growth in the sales markets.

In the estimations for the period extending to the second quarter of 2010, the two quarters that show the sharpest slump in global trade (the fourth quarter of 2008 and the first quarter of 2009) turn out to be outliers. Tests show that the special effect primarily reflects the slump in demand rather than abrupt shifts in real exchange rates. We therefore include an interaction term between weighted global demand and a dummy variable for these two quarters. The tests illustrate that the elasticity to growth in global trade rose substantially not only in the two crisis quarters but possibly also in the period starting in the second quarter of 2009. The effect of price competitiveness also appears to have increased. The recovery in goods exports thus tended to be stronger in countries where prices moderated more significantly.

Including additional explanatory variables in the estimating equation reduces the estimated elasticities to demand and relative prices in all cases. The impact of outsourcing proves to be very robust. In addition, countries where high-technology sectors account for a larger share of value added are shown to have stronger export growth. Expenditure on research and development also turns out to have a positive impact on exports. However, this impact is often statistically insignificant and is therefore left out of the table. The earnings indicator likewise has a clear positive correlation with export growth, but only in the shorter period. This may be related to differences in how industrial companies responded to the sharp slump in global trade; profits fell very sharply particularly in areas where the slump was viewed as being temporary and companies therefore chose not to cut jobs. Regarding the relative profitability of industry compared with the services sectors (including construction) – which depends, among other things, on domestic demand growth – the tests confirm that growth in goods exports tended to be slower when market services were more profitable.

Estimating the export functions for goods and services produces fairly similar results to those for goods. In particular, the elasticity to growth in sales markets seems to be virtually identical to that of goods exports and the elasticity to price competitiveness only slightly higher. However, the effect of outsourcing is somewhat weaker,

and exports do not display any significant elasticity to the relative earnings indicator for industry and market services. Hence, although a higher concentration of production capacity in the services sector dampened the momentum of goods exports, it was not necessarily associated with a weaker rise in exports as a whole, ie including services.

Estimation results [2]

Determinants of goods exports (national accounts)		Baseline relationship		Augmented	
		2000 to 2008	2000 to 2010	2000 to 2008	2000 to 2010
Weighted global demand	Coefficient	0.52*	0.66*	0.28*	0.42*
	t-value	5.3	8.9	2.4	4.5
Weighted global demand (crisis quarters)	Coefficient	.	0.65*	.	0.61*
	t-value	.	3.4	.	4.0
Price competitiveness	Coefficient	– 0.39*	– 0.55*	– 0.32*	– 0.40*
	t-value	– 3.3	– 3.3	– 2.2	– 2.2
Earnings indicator for industry [3]	Coefficient	.	.	55.3*	19.9
	t-value	.	.	3.6	1.0
Relative earnings indicator for industry – market services [3]	Coefficient	.	.	6.35*	5.78*
	t-value	.	.	3.5	4.3
Outsourcing [4]	Coefficient	.	.	89.8*	103*
	t-value	.	.	2.8	4.3
Share of high-technology sectors in value added	Coefficient	.	.	17.4*	21.5*
	t-value	.	.	5.4	4.0
Goods exports (national accounts) t-1	Coefficient	– 0.24*	– 0.20*	– 0.28*	– 0.25*
	t-value	– 6.7	– 3.8	– 7.9	– 4.2
Constant	Coefficient	0.94*	0.68*	0.37	– 0.07
	t-value	5.0	4.3	1.3	– 0.5
R² (within)		0.128	0.380	0.221	0.449

income in gross value added (national accounts). — **4** Ratio of intermediate goods imports excluding oil to total value added.

was at least 25% in 423 categories (8½% of product groups), while this was the case only in 73 categories (1½%) for France, 162 (3%) for Italy and 44 categories (1%) for Spain. The different sizes of the economies is probably relatively irrelevant.

According to a study by Venohr and Meyer, "hidden champions", ie German *Mittelstand* companies that are ranked first or second in their segment worldwide, exhibited much more pronounced growth – as measured by turnover – at 8½% a year for the 1994 to 2004 period than DAX-30 companies (5%) and German enterprises overall (2½%).[23] The specialised nature of many German *Mittelstand* companies and their extraordinary export orientation are two sides of the same coin. Focusing on technically sophisticated niche products makes particularly good business sense if large segments of the global market are supplied. Conversely, exporting is generally fairly profitable for such *Mittelstand* companies as their niches provide comparatively good protection against large enterprises both in the industrial countries and in emerging market economies, which do not have sufficient potential sales volume to enter the market. Moreover, German *Mittelstand* companies frequently have a good brand image and occupy the high-end segment. They are also better able to accommodate specific client requests than large enterprises. These advantages must be continually shored up through research-intensive innovation, adjustments to product-related services and constant optimisation of the production process. However, this appears to have been successful in recent years. Contributory factors,

besides the pronounced long-term focus of the frequently family-run enterprises, are likely to be the high standard of training enjoyed by skilled workers and engineers and the fairly close ties between management and staff.

Summary

In the years since the launch of the third stage of monetary union, the German – and with a slight lag, the Spanish export industry – have benefited from the strong growth in global trade significantly more than their French and Italian counterparts. It is striking that growth in the sales markets of all four countries under review was unable to match the expansion of global trade, as exports are still fairly strongly biased towards the euro area and other industrial countries. In addition, it should be noted that Germany's real exports were boosted to a degree by improved price competitiveness, while this factor had a negative effect for Italy and Spain, and a neutral effect for France. Deviations in the sectoral bias of the supply of goods only partly explain differences in the export growth of the EMU 4 countries. In addition, there is evidence suggesting that different earnings developments in the four countries and enterprises' diverging globalisation strategies have impacted on the export performance of the large euro-area countries.

23 See B Venohr and K E Meyer (2007), The German Miracle Keeps Running: How Germany's Hidden Champions Stay Ahead in the Global Economy, Working Papers of the Institute of Management Berlin, No 30, p 7.