The future development of EU industry in a global context

Summary

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Chapter 1.
THE FUTURE DEVELOPMENT OF EU INDUSTRY IN A GLOBAL CONTEXT

1.1. INTRODUCTION

Global trade patterns are changing rapidly for various reasons. Emerging economies are increasing their share of GDP in the world economy and therefore also their share in world total exports, thus leading to an intensification of trade relations across the globe which might further lead to changes in patterns of specialisation across world regions and countries. Further, due to the rising importance of global value chains trade volumes are increasing as products are shipped across borders several times, leading also to an increase in the granularity of trade. This global trade integration might further intensify competition in higher value-added activities where European industries have traditionally had comparative advantage. This is the basis to which the recent Commission communication on industrial policy, *For a European industrial renaissance* (European Commission, 2014), refers to. In this communication the basis on which the EU needs to compete on global markets is described as: "With scarce natural and energy resources and ambitious social and environmental goals, the EU Europe's comparative advantage in the world economy will continue to lie in high value-added goods and services, the effective management of value chains and access to markets throughout the world." (European Commission, 2014). In this rapidly changing context, it is important to know where EU industry will stand in global export markets in the future based on past and current trends of trade patterns and capacities. A picture on how global trade patterns will evolve and, related to it, how comparative advantages will change for the EU both at aggregate and the member state level, can inform the policy debate on future developments of EU external competitiveness, and highlight areas where action might need to be taken in order to maintain comparative advantage in high value-added sectors and activities. The export performance of an economy is also an important indicator of GDP growth potential. Hence, an indication of the EU's future external competitiveness can also provide an insight into the growth potential at Member State and EU level.

In this study, external competitiveness is defined as how successful a country is in third markets compared to other countries.[1] The most commonly used measures of external competitiveness are world market shares and revealed comparative advantage (RCA), both of which can be calculated from standard trade data. These world market shares and RCAs not only change because of domestic developments but also because of changes in the situation of all competitor countries. Therefore, a proper assessment of likely future developments of world market shares and RCAs requires considering global developments. Furthermore, it is also necessary to explicitly consider the competitiveness of EU exports in terms of their quality relative to world export. This aspect can be measured with unit export values (UEV), which can give an indication of the quality premium of EU exports compared to those of other countries across sectors.

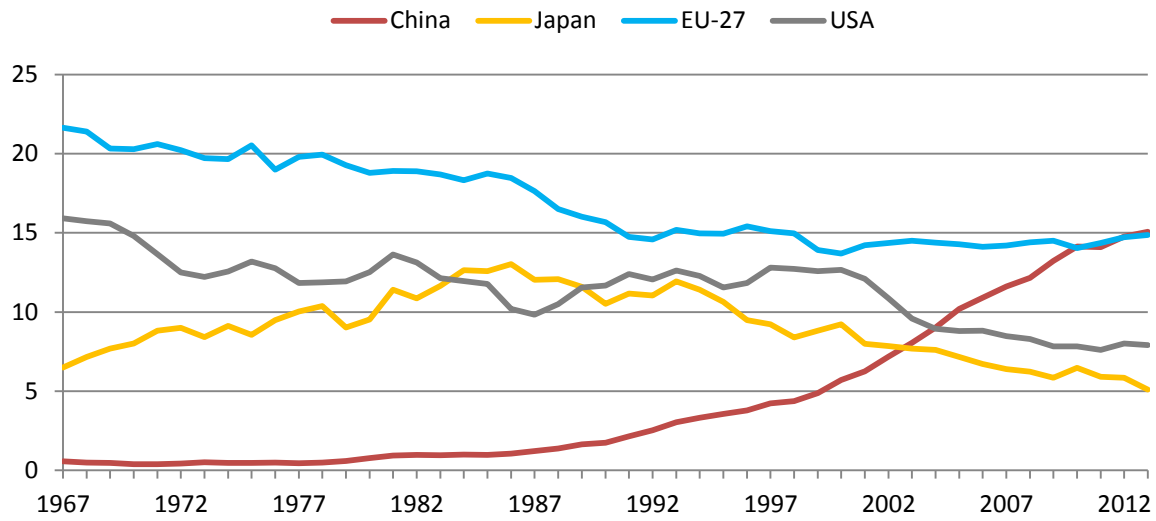
The overall objective of the study is therefore to give an assessment of likely future developments of EU exports not only at a broad macroeconomic level, but also at a more detailed sectoral level pinpointing potential future strengths and weaknesses in future EU exports. In that respect the study not only considers developments of exports at the industry level but also provides an investigation of each industry's segments into high, medium and low export values and their likely developments in the future. Finally, using insights from input-output analysis the projections of exports into the future will be translated into estimates of their potential impact on GDP and GDP growth.

[1] Note that a broader definition of "competitiveness" is stated in COM (2002): ""…the ability of the economy to provide its population with high and rising standards of living and high rates of employment on a sustainable basis" (see COM(2002) 714 final).

1.2. LONG-TERM HISTORICAL TRENDS IN GLOBAL MARKET SHARES

Figure 1.1 shows the evolution of EU trade and specialization patterns over the last 50 years or so using the CHELEM dataset. This dataset includes global trade data for 70 sectors from 1967 onwards. The world market shares are calculated as the share of exports of a country in total manufacturing relative to the manufacturing exports of all countries. The figure presents evidence on the evolution of market shares for total manufacturing in four major economies, namely China, Japan, the EU-27 and the USA.

Figure 1.1 – Evolution of export market shares in %



Note: Extra-EU trade.
Source: CHELEM; authors' calculations.

In the period considered, the EU-27 has lost 5 percentage points (a 25% drop) between 1968 and 1990. From this year on, however, the EU-27 market share has stagnated at around 15%. As one can see, the trends in market shares for the US and Japan are quite different. The US market shares dropped from 15.5 to 8% over the whole period, with a relatively stable share at around 13% in the 1990s followed by a dramatic decrease of around 6 percentage points in the 2000s. Gatto et al. (2011) provide an in-depth analysis of this decline pointing towards the general decline of the US share in world income and the relevance of several industries for explaining this downward trend. Mandel (2012) also points towards the changing composition of trade products and the diminished share of the U.S. in global output. Both papers however point out that these factors should not be seen as a decline in this country's ability to compete in global exports. Japan's trend follows an inverted U-shape curve: after an increase from around 7 to 12% in the second half of the 1980s, Japanese exports in the last 15 years of observations experienced almost the same tendencies as their US counterparts. Again, the general decline of Japan in the global output plays a role, further aggravated by the long-term stagnation of the Japanese economy since the 1990s. Together, from the beginning of the 1990s, the US and Japan appear to have been losing a total of around 14 percentage points of the world markets, a figure consistent with the almost 13 points rise of the Chinese market share from 2 to 15% of world share in the 1990-2013 period. These changes have been more significant from 2000 on. In that respect, for example Bayoumi (2011) points towards the role of trade liberalization, increasing vertical specialisation and general income convergence. Particularly, the fact that emerging market economies have become major players in global trade is an important cause. Furthermore the role of shifting patterns towards higher technology intensive industries is mentioned as an important factor.

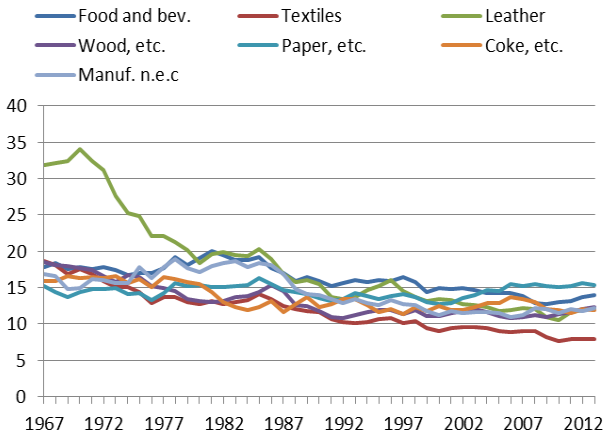
Therefore, Figure 1.2 presents EU-27's export market shares at a more detailed industry level for 14 manufacturing sectors. As a matter of fact, half of the sectors experience the same tendencies as seen in the aggregate figures above, with a decrease until the beginning of the 1990s, followed by a period with relatively constant market shares. Textiles and leather (incl. also footwear) continue to suffer from outside competition even after the 1990s, losing an additional 4 percentage points over the period[2]. Machinery and equipment, transport and paper and printing are the only sectors that have gained market shares, and compensated for the losses of market shares in the other industries by gaining all together around 6 percentage points over the last 10

[2] These trends are also driven by the Multifibre agreement which slowly expired throughout 1995-2005

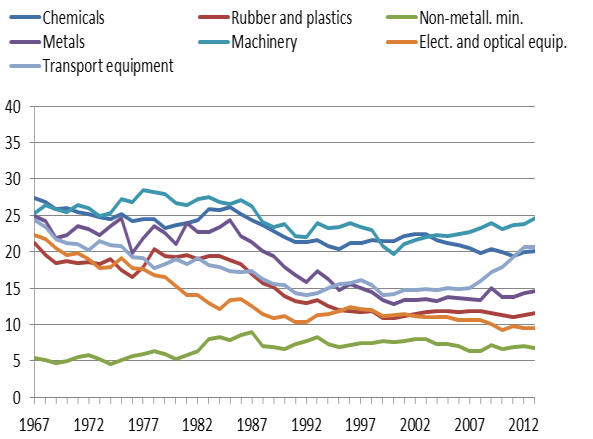
to 15 years. These sectors are characterized by a higher technology content which makes it possible to succeed with product differentiation and product quality instead of costs competition.

Figure 1.2 – Evolution of EU-27 export market shares by industry in %

Panel A Low-tech industries (incl. coke)



Panel B: Medium-low, medium-high and high tech ind.



Source: CHELEM; authors calculations.

The corresponding evolution of world market shares for Japan and the US is presented in Figure 1.3. It is interesting to note that the sector level trends for Japan are also, to some extent, well represented by the aggregate market share observed in Figure 1.1 as the bell-shaped curve is also observed for many Japanese industries. One important thing to note about Japan is that most of the industries have lost market shares after 1985. The evolution of US total market shares however hides a more distinct composition effect, at least over the early 1967-1990 period. Panel D in the figure below shows that market shares in most of the medium-high and high-tech industries have in part dramatically shrunk over this period. After the 1990s, the shares of all of industries (except coal and petroleum) kept decreasing.

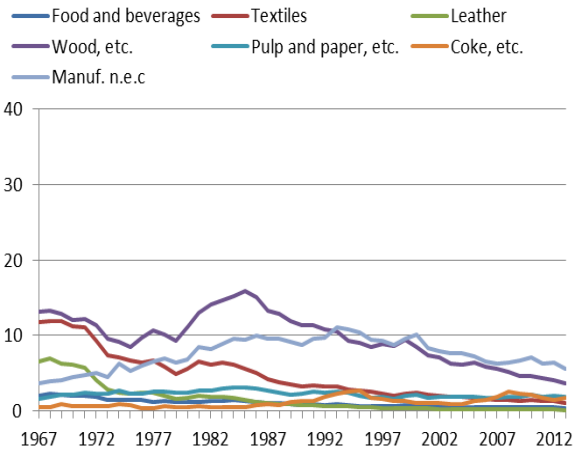
Finally, China's overall market share is characterised by a rather strong performance in most sectors during the period (see also Figure 1.3). Note however that while the market share growth of some sectors (the lower-tech industries like textile, wood and paper and printing) has started already in the mid-1980s, the dramatic growth of some other (more capital intensive, such as machinery or electrical and optical equipment) industries started only in the mid-1990s or beginning 2000. While the growth dynamics of the former industries has steadily been slowing down from the 1990s onwards, the latter have maintained their dynamic until now. Nevertheless, some sectors like transportation or chemicals – classified as medium-high and high-tech intensive (see e.g. OECD, 2011) in new technology and R&D - were relatively under-performing in China compared to the other industries, still even so over the last years of observation. Hence, one could classify the development of sectors in China over the past 50 years into three distinct waves of development: The first one concerns the rapid growth of the low-tech industries which has started in the mid-1980s and has been slowing down in recent years; the second wave is related to the expansion of more capital intensive industries that have started to increase their world market shares around 10 years later. Finally, starting in the mid-1990s, a third wave seems to appear gaining momentum in the mid-2000s: it concerns industries generally known to be at the leading edge of technological developments. To some extent, today's China appears to be experiencing a path of its export development that shows similarities to the development trajectory of Japan, in the nineteen seventies and the nineteen eighties.

Summarising, in the long-term perspective the EU-28 seem to have performed better when compared to the US and Japan in retaining its share of exports in times when emerging countries – and particularly China – increased their market shares significantly. Most industries in the EU-28 have experienced a decline in their market shares in the 1970s and 1980s which since then have stabilised more or less (with the exception of textiles industry). However, some industries – chemicals and machinery – kept their relatively high world market shares since the 1990s with the transport equipment industry significantly gaining market shares recently. This is different from the changes in the US and Japan which also experienced declines of market shares in these industries. Further, the US and Japan also suffered from severe declines in market shares in the electronics industry in the recent period which is, however, not observed in the case of the EU-28. However, in contrast to the US and Japan, the EU-28 never had a strong comparative advantage in this industry.

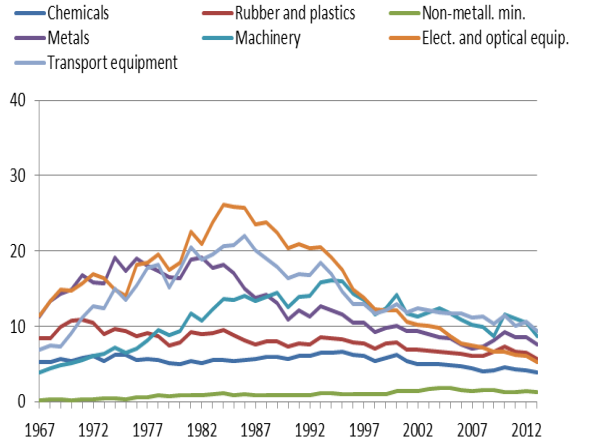
Figure 1.3 – Evolution of world market shares by industry for Japan and the US in %

Japan

Panel A: Low-tech industries (incl. coke)

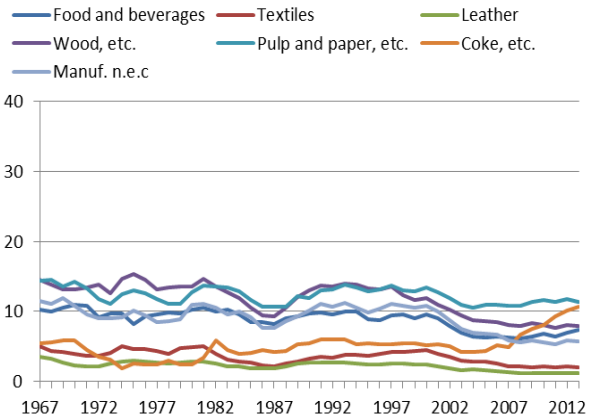


Panel B: Medium-low, medium-high and high tech ind.

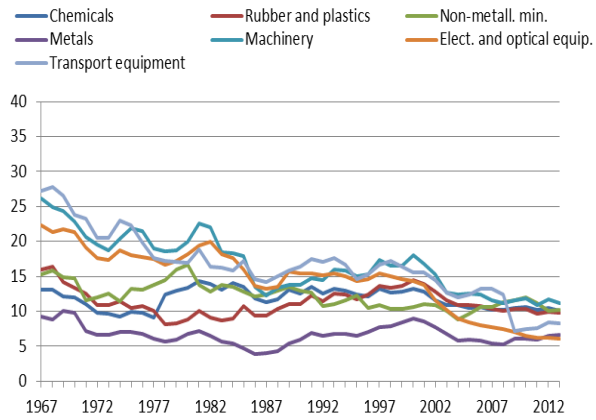


USA

Panel C: Low-tech industries (incl. coke)

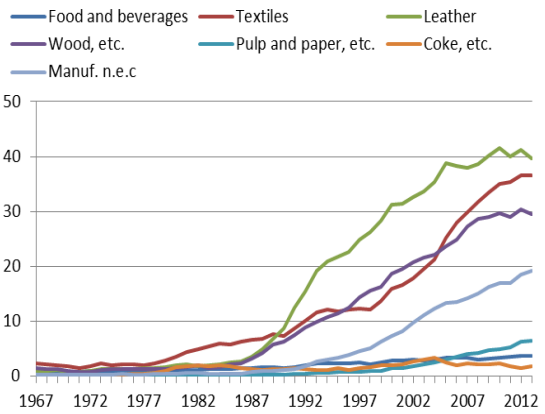


Panel D: Medium-low, medium-high and high tech ind.

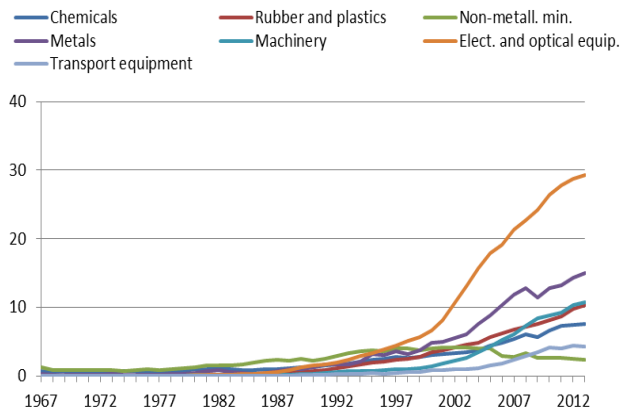


China

Panel E: Low-tech industries (incl. coke)



Panel F: Medium-low, medium-high and high tech ind.



Source: CHELEM; authors calculations.

1.3. TRENDS IN MANUFACTURING GROSS EXPORTS SINCE 1995

This section provides a detailed comparison of export structures of the EU and its major international competitors. It focuses on the developments of exports for the EU-28 (for extra-EU-28 exports) and individual Member States (including intra-EU trade) at NACE Rev.1 2-digit industry levels since 1995. The description is based on data for gross exports and stated in terms of shares of global exports and revealed comparative advantages (RCA). The data source for this analysis is the BACI dataset provided by CEPII which is based on countries' customs data reported by UN-COMTRADE. It provides FOB (or FOB equivalent) data on exports (import) in values (1000s of US dollars) at the 6 digits of the Harmonized System Nomenclature (HS, 1992 version) from 1995 to 2013, for all pairs of countries/territories in the world. To convert these data from the HS 6-digit level into industry the correspondence tables from WIOD (see www.wiod.org) have been used.

The EU profile of exports compared to US, China and Japan

To start with, Table 1.1 presents the shares of each country or country group in world trade flows[3], the shares by industry and the cross-dimension, i.e. shares by countries and country groups and industries.

Table 1.1 – Shares in total world exports 2013, in %

	EU-28	China	Japan	USA	Other EU	North America	South America	Asia	Oceania	Africa	Other	Total
Food, Beverages and Tobacco	1.3	0.4	0.0	0.8	0.4	0.5	0.9	0.9	0.4	0.2	0.0	5.7
Textiles and Textile Products	0.5	2.4	0.1	0.2	0.3	0.2	0.0	1.4	0.0	0.2	0.0	5.2
Leather, Leather and Footwear	0.2	0.8	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	1.5
Wood and Products of Wood and Cork	0.2	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.7
Pulp, Paper, Paper, Printing and Publishing	0.5	0.2	0.1	0.4	0.1	0.2	0.1	0.1	0.0	0.0	0.0	1.8
Coke, Refined Petroleum and Nuclear Fuel	1.3	0.2	0.2	1.2	1.1	0.3	0.2	1.8	0.1	0.3	0.1	6.7
Chemicals and Chemical Products	3.7	1.2	0.9	2.3	1.2	0.6	0.2	2.5	0.1	0.2	0.1	12.8
Rubber and Plastics	0.5	0.7	0.3	0.4	0.1	0.2	0.0	0.5	0.0	0.0	0.0	2.8
Other Non-Metallic Mineral	0.3	0.4	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	1.2
Basic Metals and Fabricated Metal	1.8	1.6	0.8	1.0	1.9	0.7	0.6	1.3	0.4	0.7	0.1	10.8
Machinery, Nec	3.3	2.1	1.3	1.5	0.5	0.5	0.1	1.0	0.0	0.0	0.0	10.4
Electrical and Optical Equipment	3.0	7.8	1.8	2.4	0.8	1.3	0.0	6.2	0.1	0.1	0.1	23.6
Transport Equipment	3.9	0.8	1.8	2.4	0.4	1.7	0.2	1.5	0.1	0.1	0.1	12.9
Manufacturing, Nec; Recycling	0.7	1.3	0.2	0.5	0.3	0.3	0.1	0.5	0.1	0.1	0.0	4.0
Total manufacturing	21.2	20.1	7.4	13.1	7.4	6.5	2.6	18.2	1.2	1.9	0.5	100.0

Source: BACI; authors calculations.

Even when excluding intra-regional flows, the EU-28 is still the most important manufacturing exporter in 2013, accounting for about one fifth of these trade flows. But nowadays, the EU-28 is closely followed by China (20.1%) and the Asian countries (18.2%). The remaining two major economies, the USA and Japan, account for 13.1% and 7.4%, respectively. By industry (see last column), these world trade flows are dominated by electrical and optical equipment which takes about a quarter of world trade, and other medium-high to high-tech sectors which account for about 10-13% of world extra-regional export flows. These industries include chemicals (12.8%), machinery (10.4%), electrical and optical equipment (23.6) and transport equipment (12.9%). Thus these four industries together account for more than 70% of world extra-regional trade flows. Trade flows in these industries are dominated by the more advanced countries and regions which are presented in more detail below.

Table 1.2 shows the respective changes of these shares between 1995 and 2013 in percentage points. The EU-28 lost 3.5% of world market shares for total manufacturing extra-regional exports, mostly at the expense of China (+13.2ppt) and Asian countries (+3.5ppt). The losses of EU-28 in terms of world market shares have been lower than in the USA (-4.7ppt) and Japan (-8.9ppt). World export structures have also changed with the share of exports of the coke and refined petroleum in extra-regional trade flows increasing by 4.5ppt and of the basic and fabricated metals industry by 1.4ppt. Concerning the medium-high to high tech industries mentioned above one

[3] These figures exclude trade within the regions identified.

finds that these shares increased in the chemicals industry (+1ppt) and the electrical and optical equipment industry (+1.1ppt) whereas those for machinery (-1.4ppt) and transport equipment (-1.1ppt) declined. [4]

Table 1.2 – Change in shares in total world exports 1995-2013, in ppt

	EU-28	China	Japan	USA	Other EU	North America	South America	Asia	Oceania	Africa	Other	Total
Food, Beverages and Tobacco	-0.5	0.0	0.0	-0.5	0.0	-0.1	0.1	-0.2	-0.1	-0.1	0.0	-1.2
Textiles and Textile Products	-0.7	0.4	-0.2	-0.3	-0.1	-0.3	-0.1	-1.0	-0.1	-0.2	0.0	-2.5
Leather, Leather and Footwear	-0.2	0.2	0.0	0.0	0.0	0.0	-0.1	-0.2	0.0	0.0	0.0	-0.4
Wood and Products of Wood and Cork	0.0	0.1	0.0	-0.1	0.0	-0.3	0.0	-0.2	0.0	0.0	0.0	-0.7
Pulp, Paper, Paper, Printing and Publishing	-0.4	0.1	-0.1	-0.5	-0.1	-0.6	0.0	0.0	0.0	0.0	0.0	-1.6
Coke, Refined Petroleum and Nuclear Fuel	0.8	0.1	0.1	0.9	0.9	0.2	0.2	1.2	0.0	0.1	0.1	4.5
Chemicals and Chemical Products	-0.3	0.9	-0.6	-0.3	0.0	0.0	0.0	1.4	0.0	0.0	-0.1	1.0
Rubber and Plastics	0.0	0.5	-0.1	-0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4
Other Non-Metallic Mineral	-0.3	0.3	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2
Basic Metals and Fabricated Metal	-0.3	1.1	-0.4	-0.2	0.6	-0.2	0.0	0.4	0.1	0.3	0.0	1.4
Machinery, Nec	-1.1	1.8	-1.4	-0.7	-0.3	0.1	0.0	0.2	0.0	0.0	0.0	-1.4
Electrical and Optical Equipment	-1.0	6.4	-3.7	-2.2	0.2	0.2	0.0	1.2	0.0	0.1	-0.1	1.0
Transport Equipment	0.4	0.7	-2.1	-0.6	0.2	-0.5	0.1	0.7	0.0	0.1	0.0	-1.1
Manufacturing, Nec; Recycling	0.1	0.6	-0.1	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Total manufacturing	-3.5	13.2	-8.9	-4.7	1.5	-1.4	0.2	3.5	-0.2	0.5	-0.1	0.0

Source: BACI; authors calculations.

Table 1.3 presents more detailed figures concerning changes in world market shares by industry for the year 2013. The EU-28 is still the most important exporter in five industries including chemicals (28.6%), machinery (32.0%) and transport equipment (30.5%). These market shares are well above the one for the EU-28 as a whole with 21.2%. This also applies to food, beverages and tobacco (22.6%), and pulp and paper (29.8%). In all other industries - apart from the two exceptions of coke and petroleum and basic and fabricated metals - the second largest exporter is China, though differences in some industries are relatively small. Again there are significant changes over time. China has been able to increase market shares in all industries (with the only exception in coke and petroleum) with impressive magnitudes between 9.7ppt in basic and fabricated metals to more than 20ppt in textiles, footwear, non-metallic mineral products, and electrical and optical equipment.[5] Despite the decline in the overall market share, the EU-28 has been able to increase market shares in the wood and wood products industry (+8.3ppt), pulp and paper industry (+2.3ppt) and transport equipment (+5.2ppt). The most significant losses in market shares are observed for the textile industry (-6.0ppt), non-metallic mineral products (-16.9ppt) and basic and fabricated metals (-5.5ppt). It is further interesting to note that Japan lost significant market shares in medium-high to higher tech industries like machinery (-10.6ppt), electrical and optical equipment (-16.9ppt), and transport equipment (-14.1ppt). These losses have been less dramatic for the US for which market shares declined in food, beverages and tobacco (-4.3ppt), rubber and plastics (-7.5ppt), and electrical and optical equipment (-10.0ppt).

Table 1.4 shows the implications of this evidence in terms of export structures of these countries and regions. These export structures show the relative importance of a particular industry's exports in the total export basket of a country. For the EU-28 exports in chemicals (17.3%), machinery (15.8%), electrical and optical equipment (14.1%), and transport equipment (18.5%) account for about two-thirds of exports. This is even more pronounced in case of the US for which these four industries account for almost 70% of total extra-regional exports and even more so for Japan with a respective share of about 84%. Equally large shares are observed for North-America (i.e. Canada) and the Asian countries with larger shares in either one or two of these industries. This is less so for China as the share of textile exports (11.8%) is still rather high whereas those of chemicals (6.2%), machinery (10.7%) and particularly transport equipment (3.8%) are rather low. The other country groups show rather "traditional" export structures, mostly driven by natural resource endowments.

[4] These broad changes also hold when excluding the coke and petroleum industry.
[5] Note that these figures are measured in terms of gross exports.

Table 1.3 – World market shares

	World market shares 2013 (in %)				Change in world market shares 1995-2013 (in ppt)			
	EU-28	China	Japan	USA	EU-28	China	Japan	USA
Food, Beverages and Tobacco	22.6	6.5	0.7	13.5	-3.6	1.9	-0.5	-4.3
Textiles and Textile Products	8.9	45.8	1.3	3.1	-6.0	20.2	-2.3	-3.5
Leather, Leather and Footwear	15.7	51.1	0.2	1.9	-6.9	21.5	-0.7	-1.9
Wood and Products of Wood and Cork	20.7	19.6	0.1	7.9	8.3	14.0	-0.2	-5.6
Pulp, Paper, Paper, Printing and Publishing	29.8	12.6	3.0	20.5	2.3	10.3	-1.1	-4.5
Coke, Refined Petroleum and Nuclear Fuel	19.6	2.2	2.3	17.3	-2.5	-0.4	-1.4	6.4
Chemicals and Chemical Products	28.6	9.7	6.7	17.9	-4.6	6.6	-5.8	-4.0
Rubber and Plastics	18.6	26.1	10.0	13.6	-5.2	17.2	-6.1	-7.5
Other Non-Metallic Mineral	24.1	32.7	7.7	9.6	-16.9	24.4	-6.8	-2.6
Basic Metals and Fabricated Metal	16.4	15.0	7.1	9.1	-5.5	9.7	-5.3	-3.3
Machinery, Nec	32.0	20.6	12.1	14.2	-5.8	17.7	-10.6	-4.3
Electrical and Optical Equipment	12.7	33.2	7.6	10.3	-5.1	26.7	-16.9	-10.0
Transport Equipment	30.5	5.9	14.1	18.3	5.2	5.2	-14.1	-2.8
Manufacturing, Nec; Recycling	18.0	33.2	4.3	12.9	-2.1	11.9	-4.0	-5.3

Source: BACI; authors calculations.

Table 1.4 – Export structure

	Export structure 2013 (in %)				Change in export structure 1995-2013 (in ppt)			
	EU-28	China	Japan	USA	EU-28	China	Japan	USA
Food, Beverages and Tobacco	6.0	1.8	0.5	5.8	-1.3	-2.9	0.0	-1.0
Textiles and Textile Products	2.2	11.8	0.9	1.2	-2.5	-17.0	-0.8	-1.6
Leather, Leather and Footwear	1.1	3.8	0.0	0.2	-0.6	-4.3	-0.1	-0.2
Wood and Products of Wood and Cork	0.7	0.7	0.0	0.4	0.0	-0.4	0.0	-0.6
Pulp, Paper, Paper, Printing and Publishing	2.5	1.1	0.7	2.8	-1.3	-0.1	-0.1	-2.0
Coke, Refined Petroleum and Nuclear Fuel	6.2	0.7	2.1	8.9	4.3	-0.1	1.6	7.5
Chemicals and Chemical Products	17.3	6.2	11.7	17.5	1.4	0.8	2.6	3.0
Rubber and Plastics	2.5	3.6	3.8	2.9	0.2	0.6	1.5	0.1
Other Non-Metallic Mineral	1.3	1.9	1.2	0.9	-1.0	0.2	0.0	-0.1
Basic Metals and Fabricated Metal	8.3	8.0	10.4	7.5	0.0	0.8	3.2	0.9
Machinery, Nec	15.8	10.7	17.2	11.3	-2.3	5.8	0.7	-1.0
Electrical and Optical Equipment	14.1	39.1	24.4	18.6	-2.1	17.7	-9.7	-7.1
Transport Equipment	18.5	3.8	24.6	18.0	4.3	2.3	0.4	1.5
Manufacturing, Nec; Recycling	3.4	6.6	2.3	3.9	0.7	-3.5	0.7	0.6

Source: BACI; authors calculations.

The respective changes in export structures over the period 1995-2013 are presented in the four columns on the right. Not considering the coke and petroleum industry, one can observe a shift towards chemicals (+1.4ppt) but more strongly towards transport equipment (+4.3ppt) for the EU-28. For the US and Japan similar shifts can be observed which are however more pronounced for the chemicals industry (+3.0 and 2.6ppt, respectively), but less so for the transport equipment industry (+1.5 and +0.4ppt, respectively). An important difference is the much larger decline in export shares in the electrical and optical industry which amounts to -7.1ppt in the case of the US and -9.7ppt in the case of Japan. This is mostly driven by changing patterns of Chinese export structures which experienced a decline of 17.0ppt of exports of the textiles industry and an increase of 17.7ppt of exports of the electronics industry. A significant increase is also observed in the machinery industry with +5.8ppt. Concerning the other country groups a relatively common pattern is that export structures shifted away from the lower-tech industries (like food, textiles, leather, wood and pulp and paper) with the corresponding increases are being more homogenous.

Taking these indicators together yields the revealed comparative advantages. The RCA compares the position of an industry in a particular country's export basket relative to that industry's position in global exports. Alternatively, it shows the country's world trade share in a specific industry relative to this country's share in global export flows. A value larger than 1 indicates that a country has a comparative advantage in this industry, i.e. is specialised relatively more in this industry's exports as compared to the world average. Table 1.5 shows this indicator for 2013 as well as its changes between 1995 and 2013 across countries and industries. Given that interpretation and the previous discussion it is therefore not surprising that the EU-28 shows a strong revealed

comparative advantage (RCA) in machinery (1.51), transport equipment (1.44) and chemicals (1.35); a still existing but less pronounced RCA is observed for food, beverages and tobacco (1.07) and pulp and paper (1.41).

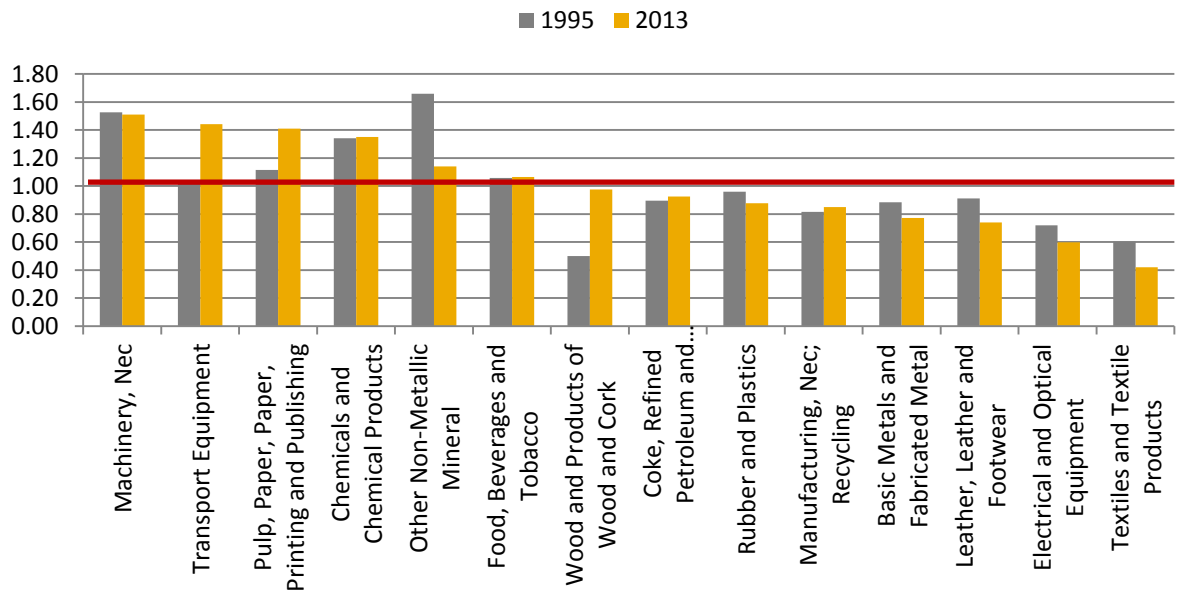
Table 1.5 - Revealed comparative advantages*, 2013

	Revealed comparative advantages, 2013 (in %)				Change in revealed comparative advantages, 1995-2013			
	EU-28	China	Japan	USA	EU-28	China	Japan	USA
Food, Beverages and Tobacco	1.07	0.32	0.10	1.03	0.01	-0.36	0.02	0.03
Textiles and Textile Products	0.42	2.28	0.18	0.24	-0.18	-1.46	-0.05	-0.13
Leather, Leather and Footwear	0.74	2.54	0.03	0.15	-0.17	-1.79	-0.03	-0.07
Wood and Products of Wood and Cork	0.98	0.98	0.02	0.60	0.48	0.15	0.00	-0.15
Pulp, Paper, Paper, Printing and Publishing	1.41	0.63	0.41	1.57	0.29	0.28	0.16	0.17
Coke, Refined Petroleum and Nuclear Fuel	0.93	0.11	0.31	1.32	0.03	-0.27	0.08	0.71
Chemicals and Chemical Products	1.35	0.48	0.91	1.37	0.01	0.03	0.14	0.14
Rubber and Plastics	0.88	1.30	1.35	1.04	-0.08	-0.01	0.37	-0.14
Other Non-Metallic Mineral	1.14	1.63	1.04	0.73	-0.52	0.41	0.15	0.05
Basic Metals and Fabricated Metal	0.77	0.75	0.97	0.70	-0.11	-0.03	0.20	0.00
Machinery, Nec	1.51	1.02	1.65	1.09	-0.02	0.61	0.25	0.05
Electrical and Optical Equipment	0.60	1.65	1.03	0.79	-0.12	0.71	-0.48	-0.35
Transport Equipment	1.44	0.29	1.91	1.40	0.42	0.19	0.18	0.21
Manufacturing, Nec; Recycling	0.85	1.66	0.59	0.99	0.04	-1.46	0.08	-0.03

**Note: Balassa-index*
Source: BACI; authors calculations.

These patterns of RCAs have changed over time as indicated in Figure 1.4. The EU-28 was able to keep its position in machinery and chemicals but lost it in other non-metallic mineral products, mostly due to strong increases in China and Japan. It could furthermore build up RCAs in transport equipment (where the EU-28 shows a RCA of 1) and the pulp and paper industry. In other industries where the EU-28 started with a comparative disadvantage these have further increased with the exception of wood and wood products. Japan and the US have experienced stronger declines of their RCAs in electrical and optical equipment but less strong increases of RCAs in transport equipment (in which these countries had a comparative advantage already in 1995). For China the RCAs decreased in the lower tech industries (textiles and leather) and strongly increased in machinery and electrical and optical equipment.

Figure 1.4 – Revealed comparative advantages* of EU-28, 1995 and 2013



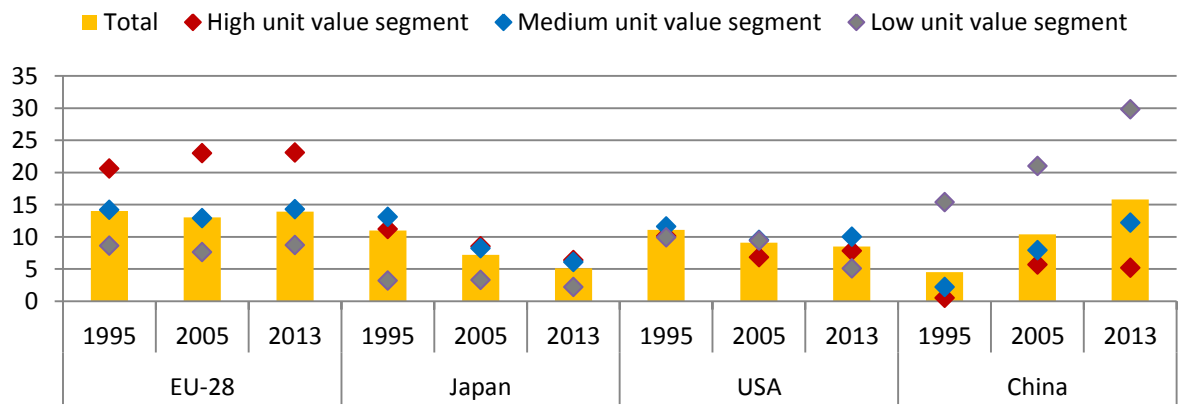
**Note: Balassa-index minus 1; industries are ranked according to RCA in 2013; a value above 1 indicates a comparative advantage.*
Source: BACI; wiiw calculations.

EU quality competitiveness profile compared to that of US, China and Japan.

So far, the chapter presented trends of exports at a rather broad industry level. However, within each industry, a large number of products are traded which are competing for world market shares. Both the range of products delivered (the differentiation of products) as well as the quality of each product therefore needs to be taken into account in an analysis of world trade patterns. This section therefore presents an analysis of the development of quality competitiveness of export flows based on unit export values (UEV) which allows for an analysis of within-sector developments. An increase or decrease in global market shares of a particular industry can be driven, for example, by a particular set of products within that industry which might be characterised by specific characteristics, for example, being a mass product or a more sophisticated product. Considering these trade flows for individual products, unit values can be compared at which an exporter sells these products to a specific market to the unit values of other exporters into that market. If products can be sold at relatively higher prices compared to those of other competitors, this can be interpreted as higher quality (or importance of non-price factors).

For such an analysis it is necessary to use very detailed trade data which provide the values and quantities of products sold in other markets. This chapter presents an index that has been calculated using the CEPII BACI dataset. It provides quantities traded in tons (or tons' equivalent) from which it is possible to construct values per tons variables (i.e unit values) at the product level. Following Feenstra and Romalis (2014), unit values can be interpreted as quality-adjusted price of products. In a nutshell this approach considers the unit values of the export flows i.e. export values divided by quantities calculated at the HS 6-digit level, of a country into a specific destination market (e.g. another country) and compares these with the unit values of exports of other countries in this market. In the analyses presented in this chapter, these unit-values have been ranked and split into three segments for each destination country and product: a high unit value segment, a middle-segment and a low-segment. The high unit value segment comprises the top 25% of all products by exporter with the highest unit-values, the low segment captures the 25% of products with the lowest values and in-between, the products are assigned to the middle-segment of the market. These data have then been aggregated by segment and by exporting country (or alternatively, exporting group of countries such as the EU-28). This results in the share of exports in the high unit value segment as a final indicator. Further, the aggregation can be calculated for some industries or sub-industries whenever convenient. The figures presented in this section show the world market share of each country in the high unit value segment This measure is therefore related to the performance of a country within each of the segments of the market, compared to that of the rest of the world: it basically represents the *world market share of a country in* each of the three segments. These indicators are presented in Figure 1.5**Fehler! Verweisquelle konnte nicht gefunden werden.** for total manufacturing exports. In this graph, the red diamonds denote the market shares for the high unit value segment, the grey ones refer to the low unit value segment, and the blue diamonds are related to the medium segment. Finally, the yellow bars correspond to the overall market shares. It can clearly be seen that the EU-28 succeeds in having the highest market shares in the high and middle unit value segments of global markets. Besides, relative to 1995, the market shares in 2013 related to the high unit values increased by about 3 percentage points (around 15%) in 2005 and remained stable since then.

Figure 1.5 – Market shares in unit value segments

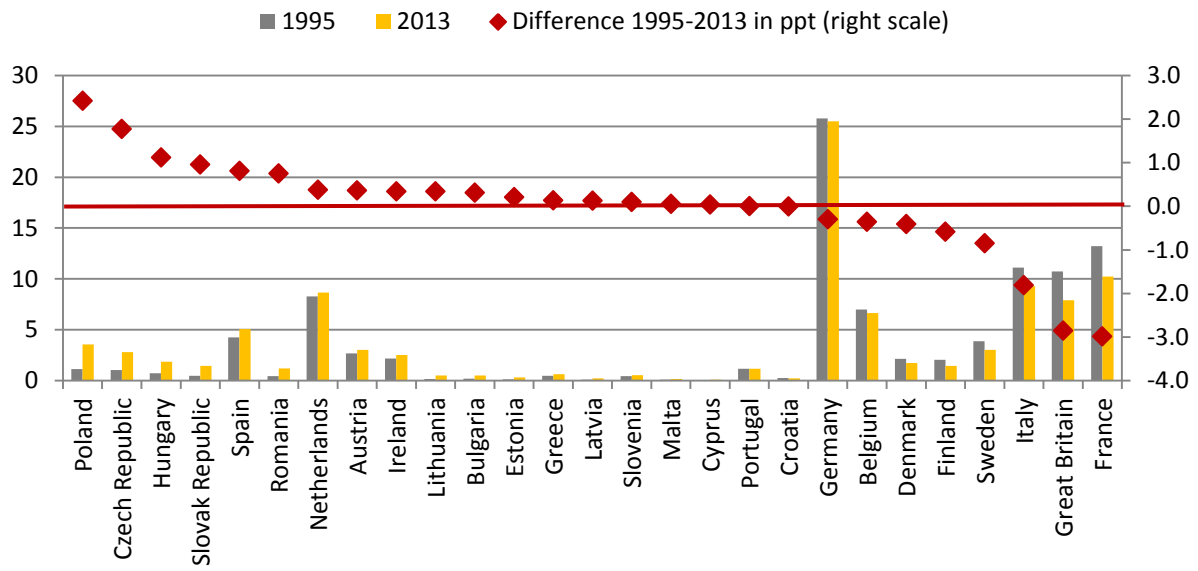


Source: BACI; authors' calculations.

Intra-EU trends: Regional concentration of manufacturing exports

However, overall patterns of trade not only changed at the global level, but also important shifts within the EU manufacturing landscape took place. Particularly, manufacturing production has become more agglomerated in the now so-called "EU manufacturing core" including Germany, Austria and Central and Eastern European countries which are characterized by a stable or even increasing share of manufacturing in GDP, a specialisation in higher-tech manufacturing and a strong integration of production networks (see Stehrer et al., 2015). An analogous pattern is also found when looking at EU member states exports. Figure 1.6 presents the share of each country in total EU exports (now including intra-EU trade) in 1995 and 2013. It shows that Germany accounts for about 25% of total EU exports, followed by Italy, France with around 10% and or slightly less than 10% in the case of the Netherlands, Belgium and the UK. All other countries account for less than 5% of EU exports each. However, there have been some important shifts in this geographic structure of exports over time. The graph therefore also shows changes in these export shares in percentage points over this period (the red diamonds). A set of countries – Poland, Czech Republic, Hungary and the Slovak Republic but also Spain and Romania – increased their shares by between 1 and 2.5 percentage points. Other countries – and, in particular Italy, the UK and France – lost shares by between 1 and 3%. This confirms other results which focus on the geography of manufacturing production patterns (see Stehrer et al. 2015) and demonstrate that there has been an agglomeration tendency of manufacturing production – accompanied by an agglomeration of manufacturing exports – across Europe.

Figure 1.6 – Contribution to EU exports by member state, in %

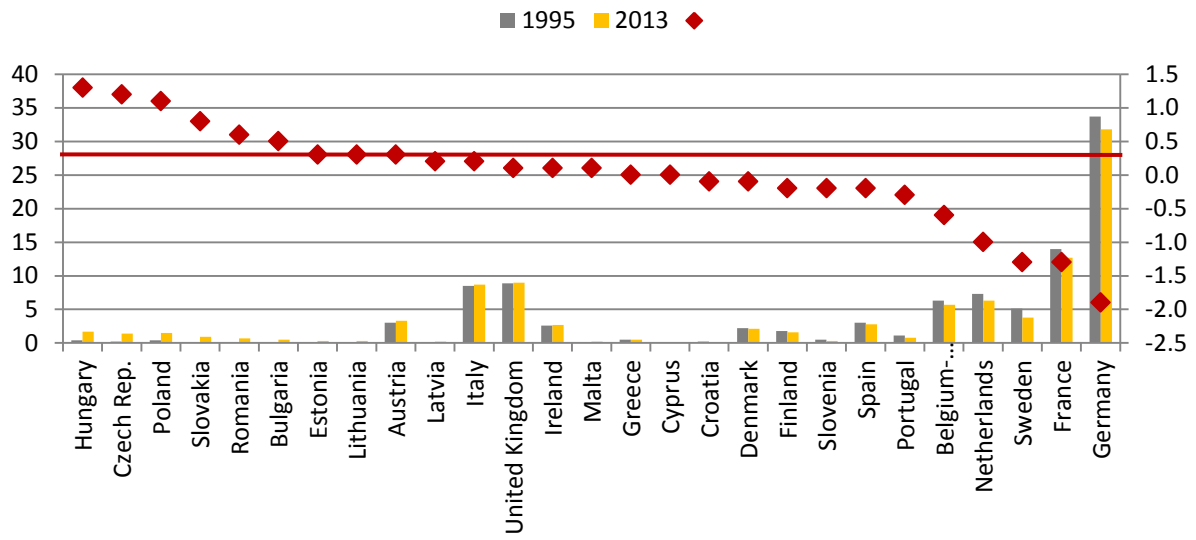


Source: BACI; authors calculations.

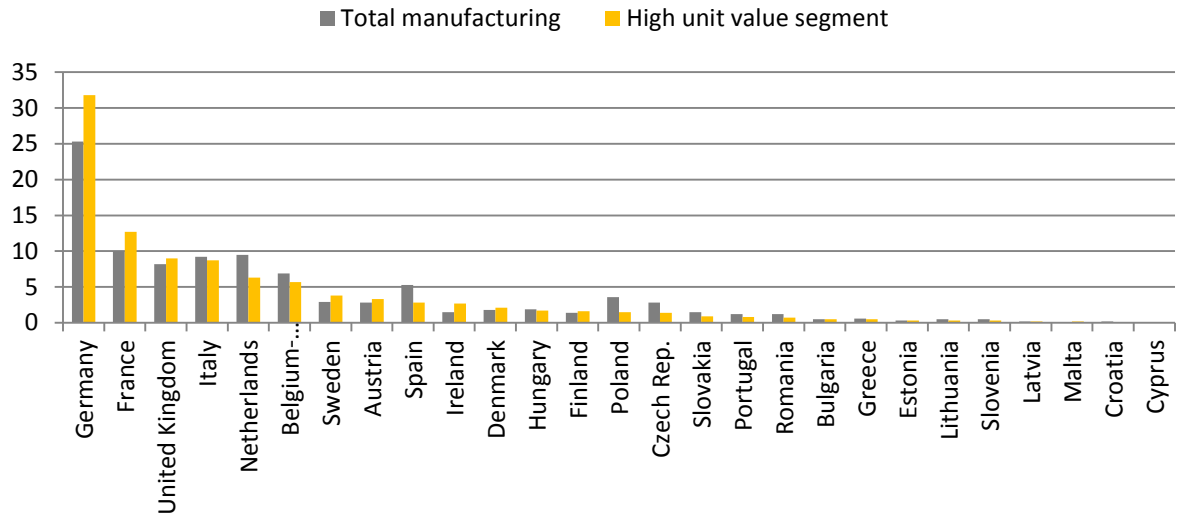
Figure 1.7 reports the contribution of EU members to the high unit value segments exports of the EU (including intra-EU trade). As above, this pattern is dominated by the large countries like Germany, France, Italy and the UK. However, consistent with above patterns, there has been changes over time in the sense that the Central and Eastern European countries gained shares in this segment of exports, whereas some of the more advanced countries significantly lost ground, particularly so the Netherlands, Sweden, France and Germany. Again, despite these developments, these countries still show higher contributions to the high unit value exports of EU relative to overall exports (see lower panel of Figure 1.7).

Figure 1.7 – Contribution to EU exports in high unit value segment, in%

Comparison over time



Comparison to total manufacturing exports, 2011



Note: Countries ranked according to market shares in 2013
Source: BACI; authors' calculations.

Summary

Summarising, the overall picture shows that the EU-28 is performing quite well in terms of its foreign competiveness in the high unit value segments – corresponding to high quality segments - of global export markets. This has been indicated by various measures showing that EU-28 export intensities in high unit value segments by product are relatively high and in range with those of Japan. However, while the ones of Japan tend to decline, those of the EU-28 are more stable. Compared to the other major economies, the US and particularly China show lower intensities. A second indicator shows that EU-28 world market shares in the high unit value segment are far above other major economies and were increasing over time, whereas those of Japan declined (from an overall lower starting level). The Chinese rise in overall market shares is mostly due to an increase in the low unit value segment. This pattern can also be observed across most industries. It is interesting to note that market shares in the high unit value segment increased particularly in the lower tech industries. These results are also confirmed when a measure for revealed comparative advantages for quality segments is used. It shows that across EU member states this structural upgrading is significant in the Central and Eastern European countries though for these countries the share of high unit value exports are still lower compared to their overall share in EU exports.

1.4. DETERMINANTS OF EXPORT PERFORMANCE AND COMPARATIVE ADVANTAGE

In a next step the main drivers of export performance are analysed which are then used further on in a scenario exercise in the next section. The strategy is to reveal determinants of bilateral export levels and evaluate them with respect to their performance indicators, particularly so in fitting world market shares and Revealed Comparative Advantages (RCAs). Specifically, a gravity model of trade is tested which includes the most important determinants of trade flows: income, population, endowments with human and physical capital in both the reporter and partner country. As one has to bear in mind that the model will then further be used to calculate predictions, a second requirement is to obtain a rather parsimonious model structure based on variables for which forecast values are available or can be constructed. The analysis presented below is based on the BACI database which provides bilateral flows of gross exports as in Section 1.3 above. Explanatory variables are taken from the Penn World Tables (PWT 8.0). The analysis covers the period 1995-2011 (as 2011 is the latest year for which GDP data and other explanatory variables are available from the PWT 8.0for this large set of countries) focusing on manufacturing exports. Methodologically, a rather parsimonious version of a standard gravity approach is taken, specified as follows:

$$\begin{aligned}\ln Exp_{REPPARjt} = \alpha_0 + \beta_1 \ln GDP_{REPjt} + \beta_2 \ln POP_{REPt} + \beta_3 \ln GDP_{PARt} + \beta_4 \ln POP_{PARt} \\ + \beta_5 \ln HC_{REPt} + \beta_6 \ln HC_{PARt} + \beta_z \ln K_{REPt} + \beta_8 \ln K_{PARt} \\ + \beta_{10} \ln CS_{REPt} + \beta_{10} \ln CS_{PARt} + Dummies + \epsilon_{REPPARjt}\end{aligned}$$

where $\ln Exp_{REPPARjt}$ denotes the log of the gross exports from the reporter to the partner country in industry *j* at year *t*. The set of explanatory variables includes GDP and total population at the country level, $\ln GDP_{ct}$ and $\ln POP_{ct}$ respectively, for both reporter and partner countries. This gravity model is extended by including additional reporter and partner specific characteristics. Specifically, the model includes an indicator of human capital endowment ($\ln HC_{ct}$) and of capital-intensity ($\ln K_{ct}$), calculated from the capital stock data and GDP taken from the Penn World Tables (PWT 8.0). Furthermore, an interaction term between human capital endowment and capital-intensity is included capturing the effects of capital-skill complementarities. The model also includes country-pair-industry fixed effects capturing time-invariant effects (like geographical distance, common language, common borders, etc.). When estimating the model at the industry level, i.e. only considering bilateral export flows for each individual industry thus allowing for industry specific coefficients, only country-pair fixed effects are used. The model is estimated for bilateral exports across broad world region analogously to the analysis undertaken in Section 1.3.

The model including all industries indicates that, as expected, trade flows are increasing with the size of the regions measured both as total GDP or total population both for reporter and partner countries. Human capital endowment has a positive effect on exports of reporters, however, no significant effect is found for partners. Capital intensity shows up negatively for both reporters and partners whereas the interaction effects capturing capital-skill complementarities are significantly positive for reporters but negative for partners. Across industries, the results are fairly consistent though with a few exceptions. For an evaluation of the predictive power of the model outcome, world market shares and RCA indicators derived from the actual flows are compared with those from the fitted export flows. Figure 1.8 presents the scatterplots with respect to indicators derived from the observed export flows and those derived from the "fitted" flows. More specifically it shows the scatterplots for the logarithmic of actual and "fitted" RCAs which therefore centre around zero. Apparently, there is a rather close relationship between these two indicators as most of the points align along the 45-degree line. The correlation between the actual and the fitted indicators world market shares and RCAs is larger than $\rho = 0.95$ in all cases.

Table 1.6 - Results from panel regressions with country-pair-industry and time fixed effects

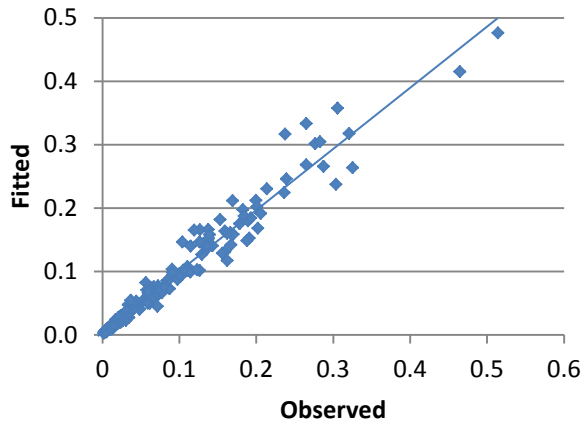
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	All	15t16	17t18	19	20	21t22	23	24	25	26	27t28	29	30t33	34t35	36t37
VARIABLES	lnEXP	lnEXP	lnEXP	lnEXP	lnEXP	lnEXP	lnEXP	lnEXP	lnEXP	lnEXP	lnEXP	lnEXP	lnEXP	lnEXP	lnEXP
Ln GDPj	0.549***	0.576***	0.583***	0.388***	0.519***	0.791***	0.0325	0.789***	0.641***	0.545***	0.693***	0.682***	0.542***	0.625***	0.278***
	(0.0139)	(0.0294)	(0.0369)	(0.0484)	(0.0575)	(0.0366)	(0.0943)	(0.0241)	(0.0306)	(0.0446)	(0.0383)	(0.0345)	(0.0392)	(0.0571)	(0.0399)
Ln Population j	0.238**	-1.380***	-1.265***	0.284	-1.531***	-3.095***	2.039***	0.116	0.587***	-0.306	-0.316	1.319***	2.595***	2.043***	2.241***
	(0.0938)	(0.198)	(0.249)	(0.327)	(0.387)	(0.247)	(0.636)	(0.163)	(0.206)	(0.301)	(0.258)	(0.232)	(0.264)	(0.385)	(0.269)
Ln GDPi	0.651***	0.660***	0.446***	0.666***	0.926***	0.498***	1.136***	0.358***	0.592***	0.550***	0.810***	0.419***	0.426***	0.522***	1.109***
	(0.0139)	(0.0294)	(0.0369)	(0.0484)	(0.0575)	(0.0366)	(0.0943)	(0.0241)	(0.0306)	(0.0446)	(0.0383)	(0.0345)	(0.0392)	(0.0571)	(0.0399)
Log Population i	0.0544	0.986***	-0.532**	-1.290***	-1.194***	-0.240	3.466***	0.795***	0.697***	-0.0838	-0.0296	0.0628	-0.959***	0.0419	-0.959***
	(0.0938)	(0.198)	(0.249)	(0.327)	(0.387)	(0.247)	(0.636)	(0.163)	(0.206)	(0.301)	(0.258)	(0.232)	(0.264)	(0.385)	(0.269)
Ln HC j	1.909***	-0.705**	-0.385	1.277**	2.698***	1.612***	0.524	0.962***	2.252***	0.773	1.136**	3.443***	5.098***	4.447***	3.601***
	(0.160)	(0.338)	(0.425)	(0.557)	(0.661)	(0.422)	(1.085)	(0.278)	(0.352)	(0.513)	(0.441)	(0.396)	(0.451)	(0.657)	(0.459)
Ln HC i	-0.0722	-0.690**	-2.462***	-2.752***	-0.552	1.230***	3.415***	1.020***	-0.191	-0.394	-0.584	-0.246	1.770***	-0.0718	-0.501
	(0.160)	(0.338)	(0.425)	(0.557)	(0.661)	(0.422)	(1.085)	(0.278)	(0.352)	(0.513)	(0.441)	(0.396)	(0.451)	(0.657)	(0.459)
Ln K i	-0.383***	0.401***	-0.199*	-0.601***	-1.103***	0.163	-0.544*	0.212***	-0.408***	0.0720	0.218*	-0.0214	-1.475***	-0.663***	-1.411***
	(0.0420)	(0.0889)	(0.112)	(0.146)	(0.174)	(0.111)	(0.285)	(0.0729)	(0.0924)	(0.135)	(0.116)	(0.104)	(0.119)	(0.173)	(0.120)
Ln K j	-0.336***	0.0190	-0.00972	0.232	-0.264	-0.860***	0.117	-0.603***	-0.451***	-0.591***	-0.353***	-0.571***	-0.762***	-0.263	-0.347***
	(0.0420)	(0.0889)	(0.112)	(0.146)	(0.174)	(0.111)	(0.285)	(0.0729)	(0.0924)	(0.135)	(0.116)	(0.104)	(0.119)	(0.173)	(0.120)
Ln HCj x Ln Kj	0.261***	-0.396***	-0.362***	0.137	0.484***	-0.220**	0.112	0.122*	0.326***	0.198*	0.0374	0.685***	1.065***	0.747***	0.717***
	(0.0370)	(0.0782)	(0.0982)	(0.129)	(0.153)	(0.0975)	(0.251)	(0.0642)	(0.0813)	(0.119)	(0.102)	(0.0917)	(0.104)	(0.152)	(0.106)
Ln HCi x Ln Ki	-0.299***	-0.275***	-0.881***	-0.754***	-0.577***	-0.112	0.714***	0.158**	-0.317***	-0.529***	-0.0969	-0.300***	-0.281***	-0.596***	-0.331***
	(0.0370)	(0.0782)	(0.0982)	(0.129)	(0.153)	(0.0975)	(0.251)	(0.0642)	(0.0813)	(0.119)	(0.102)	(0.0917)	(0.104)	(0.152)	(0.106)
Constant	-20.08***	-2.348	26.95***	8.800	32.30***	48.24***	-122.8***	-29.41***	-41.18***	-5.166	-8.589	-39.56***	-47.74***	-55.82***	-44.86***
	(2.110)	(4.463)	(5.603)	(7.350)	(8.719)	(5.560)	(14.30)	(3.661)	(4.639)	(6.769)	(5.817)	(5.228)	(5.952)	(8.668)	(6.048)
Observations	23,940	1,710	1,710	1,710	1,710	1,710	1,710	1,710	1,710	1,710	1,710	1,710	1,710	1,710	1,710
R-squared	0.619	0.809	0.484	0.455	0.531	0.679	0.575	0.895	0.856	0.600	0.808	0.824	0.769	0.672	0.814
Number of i	1,260	90	90	90	90	90	90	90	90	90	90	90	90	90	90

*Note : Standard errors in parentheses ; *** p<0.01, ** p<0.05, * p<0.1*
Source: Authors' calculations.

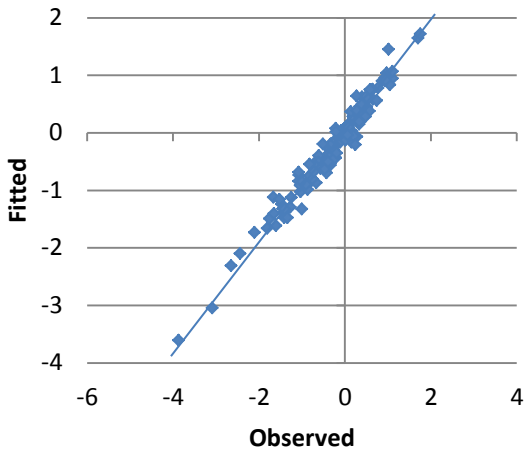
This implies that in most cases the RCAs based on the fitted vales and the actual RCAs are in either the first (north-east) or third (south-west) quadrant. The "fitted" and the actual RCAs differ qualitatively if one of them is larger (smaller) than one and the other smaller (larger) than one, which is referred to as "sign test". Again results suggest that RCAs are fitted quite well with only a few exceptional cases where actual RCAs and predicted RCAs are qualitatively different. For example, for all industries RCAs are fitted qualitatively correctly in about 96% of all cases; for the EU-28 in more than 99% of cases the RCAs are fitted qualitatively correctly.

Figure 1.8 – Actual versus "fitted" indicators based on gravity approach, 2011

Panel A: World market shares



Panel B: Revaled comparative advantages



Source: BACI, PWT8.0; authors' calculations.

The same approach has been undertaken considering the analysis of manufacturing exports at EU member state level incl. intra-EU trade. The model is calculated including trade among individual EU member states (i.e. including intra-EU trade). However, intra-regional trade flows in other world regions are not considered since scenarios including countries with rather small trade volumes and volatile developments (e.g. like some of the African or South American countries) could make the predictions less robust. The most important difference to above is that now the population variables become negatively significant. As trade across EU members accounts for a larger share of trade for most EU member states, this result suggests that larger countries are less open (smaller countries are more open) and - together with the positive coefficients for GDP - that GDP per capita is an important driver of export flows. Further, the indicator for capital-intensity now becomes significantly positive for the reporters with however a negative interaction effect. This result might point to the stronger production sharing across EU member states. The sign and correlation tests reported are again quite good with about 5% of cases where RCA are predicted with the wrong sign. However, the correlation coefficient is still at about 0.95. These sign tests perform equally well at the country level; only for Cyprus and Hungary are failures larger with about 10% of cases where fitted RCAs do not correspond to the observed ones in sign. Further, the model has been estimated for bilateral export flows in the high unit value segments as defined above for broad country groups and including EU members trade. Generally results show that human capital endowment variables in both the reporter and particularly the partner countries play a larger role. Across industries the variable capturing capital skill complementarities are positive and significant more often.

1.5. SCENARIOS OF FUTURE DEVELOPMENTS

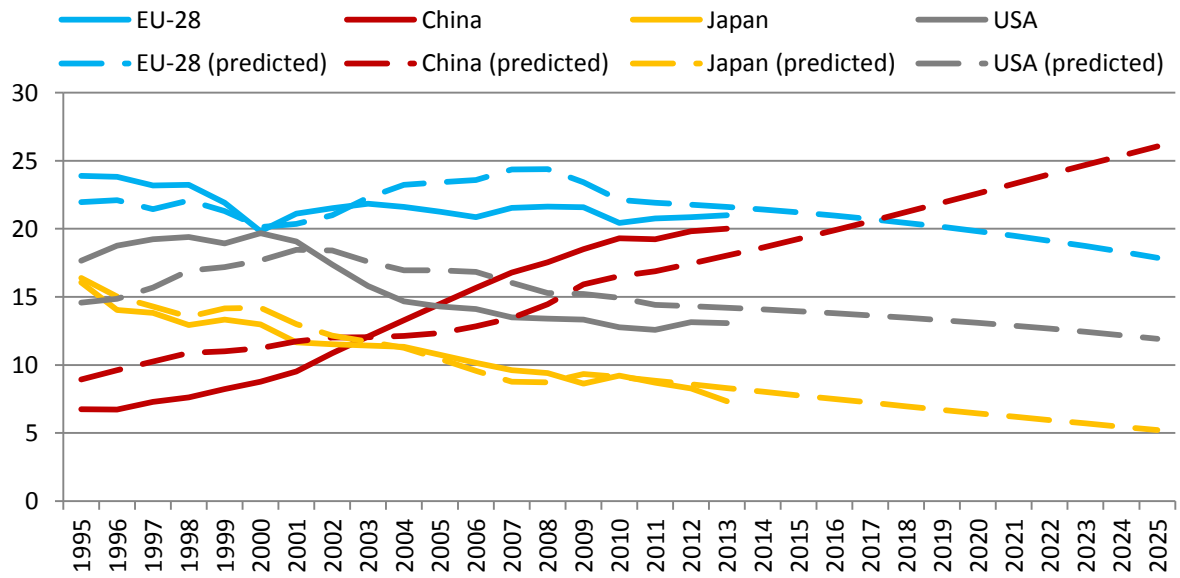
This gravity approach is finally used to predict future developments in export performance and external competitiveness for world market shares and RCAs.[6]. Based on the gravity approach discussed in Section 1.4 above an out-of-sample prediction of export flows is calculated up to 2025. From the results of this model and predicted values of population, GDP, human capital index and capital endowment in these regions associated trade flows can then be calculated. For these predictions, trend growth rates over the period 1995-2011 have been calculated, using the PWT 8.0.[7] These growth rates are reported in Table 1.7. Figure 1.9 presents the evolution of world market shares based on the gravity approach.

Table 1.7 – Trend growth rates of determinants

	GDP	Population	Human capital	Capital intensity
EU-28	2.2	0.3	0.5	1.5
China	9.4	0.7	1.1	2.4
Japan	0.7	0.1	0.4	1.4
USA	2.4	1.0	0.2	1.0
Other EU	5.7	0.1	0.0	0.0
North America	3.6	1.4	0.7	0.0
South America	3.2	1.3	0.8	1.6
Asia	4.5	1.5	1.0	2.6
Oceania	3.1	1.3	0.2	0.1
Africa	4.6	2.4	0.4	0.6

Note: Trend growth rates of human capital for Other EU and North America and for capital intensity in case of Other EU are negative and has been set to 0.
Source: PWT; authors' calculations.

Figure 1.9 - Scenario of world market shares (based on gravity model)



Source: Authors' calculations.

Concerning market shares the EU-28 would again be expected to face a decrease of its market share to about 18% in 2025 and thus about 3ppts higher as compared to the scenario applying exponential trends. The rise of

[6] In the background study results on further approaches are provided, a panel approach and simple trend analysis. The panel model performs less accurate with respect to their predictive power concerning world market shares and RCAs. Furthermore, the gravity approach has the further advantage that it is based on variables which are more conducive to perform a scenario analysis. Basically, the scenarios can be based on broad macro-trends, whereas when applying panel modelling one needs to assume future developments for each of the variables at the sectoral level. As a second approach a trend analysis has been used; this provides qualitatively similar results though quantitatively outcomes are different, particularly so with the developments of Chinese market shares. In the text some comparisons with the trend analysis are provided.

[7] 2011 is the latest year available in the PWT 8.0

China is predicted to be far less pronounced as compared to the trend scenario and would be at about 26% (as compared to 36% in the trend scenario). (Here one however has to note that the gravity model for 2013 predicts the share of China at about 18% as compared to 20% based on observed exports flows). Market shares for the US and Japan are predicted to be at about 12% and 5% respectively. Concerning individual industries and the EU-28, these market share losses are again particularly significant in machinery with -5.5ppt (see Table 1.9). Market share losses are also pronounced in chemicals (4.7ppt), electrical and optical equipment (3.3ppt). The wood and wood products industries would be expected to increase their world market share by about 3.9ppt. These changes in market shares are again to a large extent driven by Chinese export dynamics. The Chinese share in world manufacturing exports is expected to increase to about 26% (thus less than compared to the trend scenario). Furthermore, the pattern across industries is less pronounced: Chinese market shares in machinery and electrical and optical equipment would increase by 16.7ppt (compared to 30.9ppt in the trend scenario) and 17.5ppt (compared to 29ppt in the trend scenario). Nonetheless, the market shares in these two industries are expected to be 33.9% in machinery and about 46.3% in electrical and optical equipment. According to these calculations, Chinese market shares will also increasing strongly in most other industries.

Table 1.8 - Export performance indicators, 2025

	Market shares				Export structure					RCA			
	EU-28	China	Japan	USA	EU-28	China	Japan	USA	World	EU-28	China	Japan	USA
Food, Beverages and Tobacco	22.9	9.7	1.2	10.7	4.3	1.3	0.8	3.0	2.6	1.3	0.4	0.2	0.9
Textiles and Textile Products	9.9	49.2	1.6	2.9	1.0	3.5	0.6	0.5	2.2	0.6	1.9	0.3	0.2
Leather, Leather and Footwear	15.4	54.9	0.3	2.2	0.5	1.3	0.0	0.1	0.8	0.9	2.1	0.1	0.2
Wood and Products of Wood and Cork	24.8	25.7	0.2	6.1	0.6	0.4	0.0	0.2	0.4	1.4	1.0	0.0	0.5
Pulp, Paper, Paper, Printing and Publishing	31.0	18.7	3.4	13.4	1.9	0.8	0.7	1.2	1.1	1.7	0.7	0.6	1.1
Coke, Refined Petroleum and Nuclear Fuel	9.4	2.3	2.8	9.1	7.8	1.3	7.9	11.3	13.9	0.5	0.1	0.5	0.8
Chemicals and Chemical Products	25.2	17.7	5.3	13.9	14.4	6.9	10.3	11.9	9.4	1.4	0.7	1.0	1.2
Rubber and Plastics	16.7	36.7	6.5	13.3	2.4	3.6	3.2	2.9	2.5	0.9	1.4	1.2	1.1
Other Non-Metallic Mineral	29.1	35.6	6.8	8.1	1.2	1.0	0.9	0.5	0.9	1.6	1.4	1.3	0.7
Basic Metals and Fabricated Metal	16.3	22.5	6.4	6.5	9.2	8.7	12.3	5.5	9.9	0.9	0.9	1.2	0.5
Machinery, Nec	29.9	33.9	6.8	12.0	19.5	15.2	15.1	11.8	11.1	1.7	1.3	1.3	1.0
Electrical and Optical Equipment	10.0	46.3	4.4	11.4	13.9	44.1	20.8	23.7	27.8	0.6	1.8	0.8	1.0
Transport Equipment	24.9	11.9	9.3	19.8	18.9	6.2	24.2	22.6	13.7	1.4	0.5	1.8	1.7
Manufacturing, Nec; Recycling	18.7	35.7	4.0	13.8	4.3	5.6	3.1	4.8	3.7	1.0	1.4	0.8	1.2
Total manufacturing	17.9	26.0	5.2	11.9									

Source: Authors' calculations.

Table 1.9 - Export performance indicators, Difference to 2013

	Market shares				Export structure					RCA			
	EU-28	China	Japan	USA	EU-28	China	Japan	USA	World	EU-28	China	Japan	USA
Food, Beverages and Tobacco	-0.2	2.1	0.1	-1.7	-1.1	-0.9	0.1	-1.4	-2.1	0.2	0.0	0.1	0.0
Textiles and Textile Products	-0.3	6.6	-0.4	-0.8	-0.9	-6.2	-0.4	-0.6	-2.1	0.1	-0.5	0.1	0.0
Leather, Leather and Footwear	-0.8	6.3	-0.1	-0.5	-0.3	-1.8	0.0	-0.1	-0.5	0.1	-0.6	0.0	0.0
Wood and Products of Wood and Cork	3.9	7.8	0.0	-1.4	-0.1	-0.3	0.0	-0.2	-0.3	0.4	0.0	0.0	0.0
Pulp, Paper, Paper, Printing and Publishing	0.5	7.6	-0.2	-4.9	-0.7	-0.4	-0.1	-1.2	-0.8	0.3	0.1	0.2	-0.2
Coke, Refined Petroleum and Nuclear Fuel	-4.2	-0.7	0.3	-2.4	3.8	0.3	6.0	6.2	7.7	-0.1	-0.1	0.2	0.0
Chemicals and Chemical Products	-4.7	7.6	-2.1	-3.1	-2.2	0.2	-0.3	-2.5	-2.4	0.0	0.1	0.1	0.0
Rubber and Plastics	-2.7	12.5	-3.2	-2.9	-0.1	-0.1	0.0	-0.3	-0.2	0.0	0.1	0.1	0.0
Other Non-Metallic Mineral	-2.3	10.4	-2.1	-1.7	-0.4	-0.5	-0.2	-0.2	-0.2	0.2	0.0	0.2	0.0
Basic Metals and Fabricated Metal	-1.7	7.4	-1.8	-1.9	-0.2	-0.7	1.2	-1.2	-1.0	0.1	0.0	0.2	0.0
Machinery, Nec	-5.5	16.7	-5.1	-3.4	0.6	4.2	-1.4	-0.8	-0.1	0.0	0.3	-0.1	-0.1
Electrical and Optical Equipment	-3.3	17.5	-4.5	-2.9	-0.8	6.0	-4.5	-0.3	2.5	-0.1	0.2	-0.2	-0.1
Transport Equipment	-1.6	6.7	-5.5	-1.3	1.8	2.2	-0.7	1.8	-0.1	0.2	0.2	0.0	0.2
Manufacturing, Nec; Recycling	-0.1	3.4	-1.1	0.0	0.6	-2.1	0.5	0.6	-0.6	0.2	-0.4	0.1	0.2
Total manufacturing	-3.7	8.0	-3.1	-2.3									

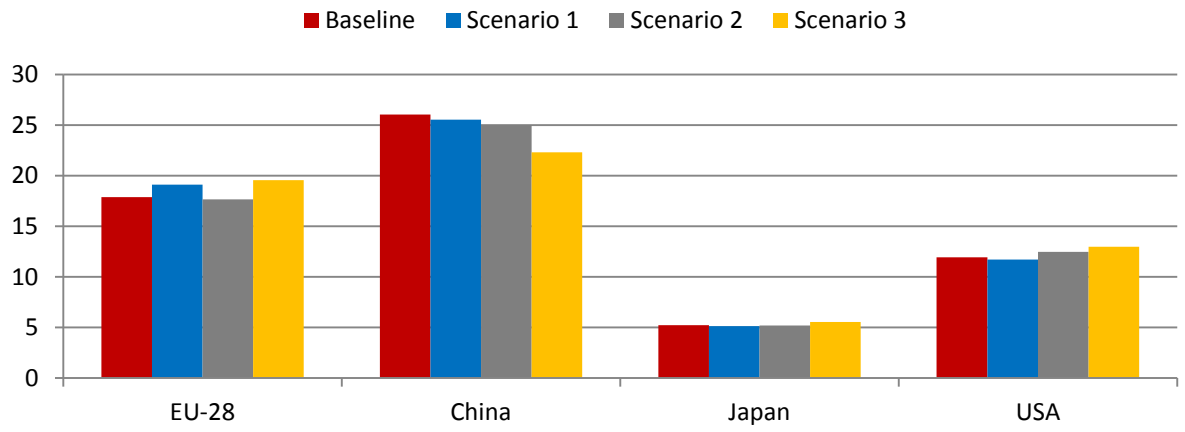
Source: Authors' calculations.

With respect to the evolution of RCAs, the EU-28 would be expected to gain RCAs in food, beverages and tobacco, pulp and paper, chemicals and transport equipment where it would be successfully strengthening its comparative advantages. In wood and wood products the results suggest that revealed comparative advantages could shift above 1. Results however also suggest that the EU-28 is losing its RCAs in machinery, though still maintaining a level of RCA of above 1 (indicating a still existing though declining specialisation) and a further loss in electrical and optical equipment. These trends are qualitatively similar to those from the trend analysis, the predicted shifts are much less pronounced, however.

Alternative scenarios and robustness checks

Above results are based on the specific assumptions of future developments of explanatory variables as presented in Table 1.7. To relax these assumptions in this section three scenarios are presented providing results for alternative developments. In the first scenario it is assumed that the growth rates for EU-28 variables for GDP, human capital and capital-intensity increase by 20%. In scenario 2 these growth rates are assumed to be higher by 20% for all countries except the EU-28 and China. And finally, in scenario 3growth rates of China are assumed to be 20% lower than those in Table 1.7 in line with other studies pointing towards somewhat diminished dynamics in China. Figure 1.10 summarises the results concerning world market shares in 2025 for the baseline and the three alternative scenarios. These results suggest that EU-28 world market shares in 2025 are in between 18 and almost 20%, those of the US between 12 and 13%, whereas those of Japan are rather independent of scenarios at about 5%. The market shares for China range between 26% in the baseline scenario to 22% in scenario 3 (assuming diminished growth dynamics in China).

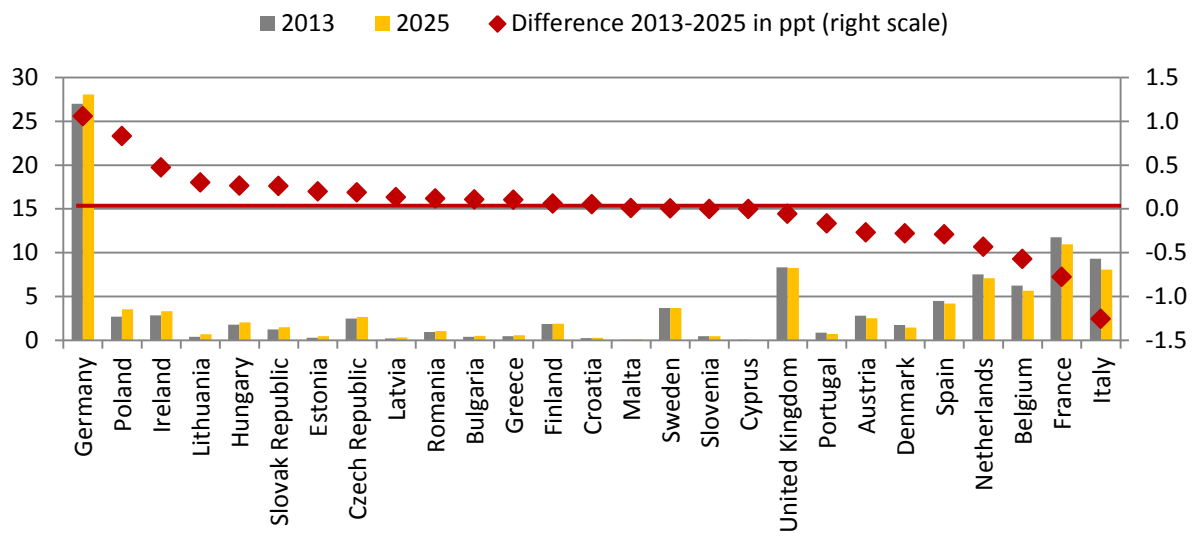
Figure 1.10 – World market shares in manufacturing exports in 2025



Source: Authors' calculations.

Similarly, a scenario is calculated based on the results of the gravity model including individual EU member states (and therefore intra-EU-28 trade) based on trend growth rates of explanatory variables. Figure 1.11 presents the developments of EU member states exports to total EU exports (incl. intra-EU trade). The scenario suggests that the ongoing agglomeration continues with countries like Germany, Poland, Ireland, Baltics, and Eastern European countries gaining shares. A number of other countries, particularly Italy, France lose shares, however.

Figure 1.11 – EU Member States shares in EU exports (scenario based on gravity approach)

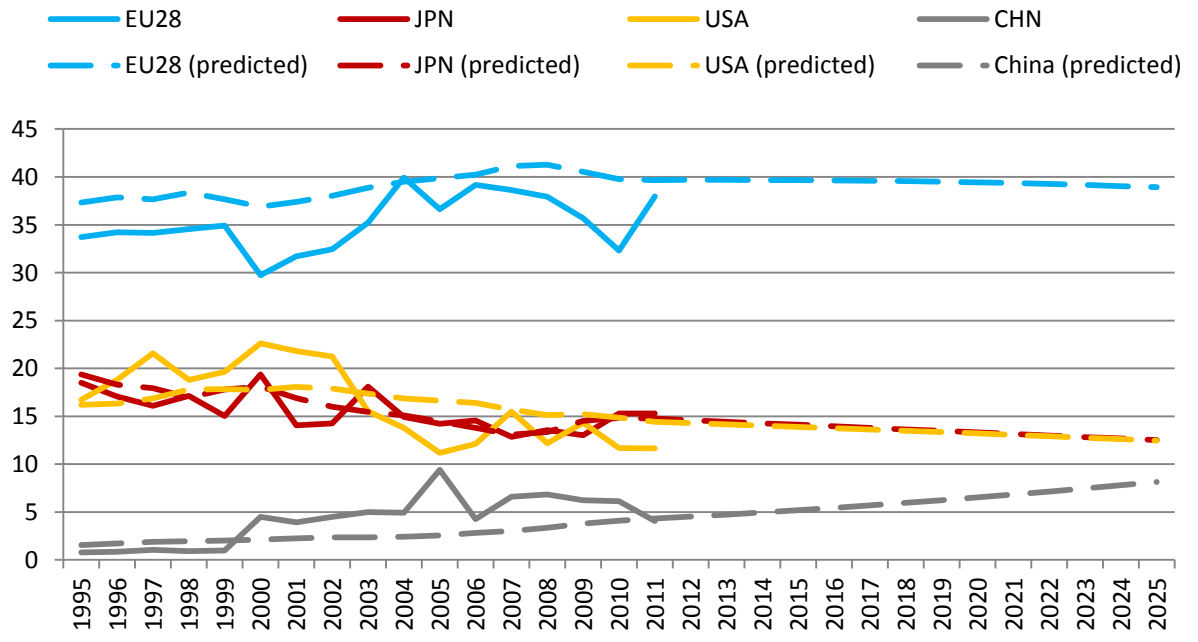


Source:BACI; PWT8.0; authors calculations.

Scenarios for high unit value segments

Finally, the prospective changes in market shares in the high unit value segments are presented based on the gravity approach. Figure 1.11 shows the evolution of the world market shares in goods that belong to the high unit value segment. The results suggest that for the EU-28 the market share in this segment is expected to remain fairly stable between 2013 and 2025 at about 40%. This needs to be seen in relation to the predicted overall evolution of market shares as presented in Figure 1.9 which are expected to decline from about 25% to 18%. China is expected to increase its market share in this segment to about 8% in 2025 which seems to be mostly at the expense of market shares of Japan and the USA. For these countries further small declines are expected, leading to about 12-13% in 2025. These developments in world market shares in the high unit value segment are very robust according to the three scenarios discussed above.

Figure 1.12 – World market shares in high unit value segment



Source:BACI; PWT8.0; authors calculations.

The evolution of the market shares will however differ across individual industries. Some industries are expected to face a significant increase between 2011 and 2025: the market shares in wood and machinery might increase by more than 10ppt during this period. However some other individual industries would face a steep decrease in their market shares in the high unit value segments, particularly so in the electrical and optical equipment industry (-5.2ppt) due to a breakthrough of China (+15.6ppt) and also in basic metals and fabricated metal (-7ppt). In 2025 the industries for which the EU-28 is expected to have the larger market shares in the high unit value segments are leather and footwear (64.2%), transport equipment (62%), chemicals (41%) machinery (40.4%), and pulp, paper and publishing (42.6%).

Summary of scenarios

These results suggest that – mostly due to the dynamics in emerging countries, most dominantly China – the share of EU exports in total world exports will decline further. A simple trend analysis based on exponential growth rates of gross exports (excluding intra-regional trade in the broad regions defined above) suggests that the EU share declines to about 15% in 2025 (from about 25% in 1995). However the EU will be able to maintain larger shares in world exports than the US - with a projected share of 10% in 2025 - and Japan - with a projected share of less than 5% only. This is mostly due to the significant increase of the Chinese market share to more than 35% in 2025 (from about 7% in 1995). However, this exercise based on exponential trends might exaggerate the Chinese developments with their impressive growth rates since the mid-1990s and particularly so in the new century. Applying a gravity approach these trends in world market shares are somewhat dampened, so the predicted share of EU in world gross exports is at 18% in 2025; similarly the US is projected to again reach a market share of about 12% in 2025. In this scenario, China is expected to reach a market share of about 27%. The decline of Japanese market shares are slightly less pronounced with Japan still showing a market share of 5% in 2025.

Concerning specialisation patterns the trend scenarios point towards an intensification along already existing comparative advantages with the (by definition) opposing trend in those industries in which the EU already shows a comparative disadvantage recently. Important industries in the former group are transport equipment, chemicals and chemical products, pulp, paper and printing, but also food and beverages. Only the machinery industry shows a decline in its revealed comparative advantages though according to the trend scenario is still able to maintain a comparative advantage in 2025 (i.e. an RCA larger than one). An important deepening of the revealed comparative disadvantage (i.e an RCA less than one becomes even smaller) is predicted for electrical and optical equipment. These trends are however much less pronounced when applying the gravity approach including endowment variables. In this case significant increases in already existing comparative advantages are only observed for pulp, paper and printing and food and beverages and to a much lesser extent for transport equipment. Other sectors which "jump" from a comparative disadvantage to a comparative advantage are basic and fabricated metals and wood and wood products, similar to findings of the trend analysis. Again comparative disadvantages in the electrical and optical equipment industry become slightly more nuanced. Summarising, therefore these results are in line with findings in Section 1.2 which highlight that, with only a few exceptions, the structure of revealed comparative advantages to be rather stable over time tends as found in the historical long-time series analysis above.

Considering various scenarios with for different dynamics of GDP, human and physical capital endowment growth, market shares for the EU-28 vary by about 1-2 percentage points. The most important changes are found once growth rates in China are reduced by 20% which in turn results in an increase of EU-28 market shares of about 1.8 percentage points. There are however only little changes in the structure of exports and specialisation measured by RCAs observed across these scenarios.

Concerning the scenarios EU member state level, the trend scenarios differ somewhat qualitatively from the gravity approach. Whereas the former predicts increasing world market shares for some of the EU-12 member states, the latter would predict declining world market shares for all countries. At the industry level, RCAs are again rather constant over time with again the EU-12 members showing slightly more dynamic patterns. This results in a further concentration of EU exports with Germany, Poland, Ireland, Hungary and other Central and Eastern European countries gaining shares whereas Italy, France, Belgium and Netherlands losing shares in overall EU exports.

With respect to the high unit value segment, scenarios suggest that the EU-28 keeps its high market share in this segment at about 40%, with also relatively small changes found for the other major economies. Particularly China is expected to increase its market shares in the high unit value segment to about 8% (compared to 27% for total trade).

1.6. IMPLICATIONS FOR GDP GROWTH

These considerations finally lead to the question of how much extra-EU-27 gross exports in a specific manufacturing industry contribute to overall GDP of the EU-27. Table 1.10 reports these figures which refer to the domestic content of extra-EU exports of the respective industry relative to GDP. Overall, manufacturing gross exports in 2011 contributed about 9.7% to GDP. The most important industries in this respect are the transport equipment industry (1.8%), machinery (1.6%), chemicals and chemical products and electrical and optical equipment (1.4%). The other industries contribute less than 1% of EU-27 GDP due to their extra-EU exports. The importance of value added created due to exports has increased over time for almost all industries with a few exceptions like textiles and clothing. These increases have been particularly strong for transport equipment (from 1.2% to 1.8%), chemicals and chemical products (from 1% to 1.4%). The contributions of exports in industries like machinery, basic and fabricated metals and electrical and optical equipment have increased by about 0.3ppts though from different levels.

In a slightly different interpretation these figures can also be used to represent the percent increase of EU-27 GDP due to a 1% increase in extra-EU gross exports. As an example, if the level of gross exports of transport equipment increases by one percent, the level of EU-GDP would be expected – everything else equal – to increase by 0.018%. Figures for the other industries can be interpreted analogously. From this it also follows that a general increase of the level of EU-27 extra-EU manufacturing gross exports by 1% would increase the overall GDP by about 0.1%. Therefore, above results are used to study the impacts of exports and their prospective developments in terms of impact on GDP and GDP growth. The high tech industries – chemicals, machinery, electrical and optical equipment and transport equipment – are those with the largest contribution to GDP mostly due to their importance in the overall export basket of the EU. These industries are – amongst a few others – characterized by relatively large growth rates in exports since 1995 and for the projection period. Combining both of these information allows one to calculate the contribution to GDP growth (i.e. multiplying the growth rate with the contribution to GDP). The result of this is presented in the last but one column in Table 1.10 and can be interpreted as percentage point contribution to GDP growth. The largest contribution would stem from the transport equipment industry with 0.15ppt, followed by machinery with 0.12ppt and chemicals and electrical and optical equipment with 0.09ppt, closely followed by rubber and plastics with 0.07ppt. Total manufacturing exports as projected would therefore contribute 0.7ppt to the overall GDP growth rate of the EU. As in the scenarios a GDP growth rate of 2.2% has been assumed this would imply that about 45% of GDP growth would be driven by exports.[8]

Table 1.10 – Implications for GDP growth – manufacturing exports

	Contribution to GDP 2011	Growth rate of gross exports 1995-2013	Growth rate of exports according to baseline scenario	Annual contribution to GDP growth (in ppt)	Annual contribution to GDP growth (in %)
Food, Beverages and Tobacco	0.73	5.6	5.6	0.04	2.6
Textiles and Textile Products	0.31	2.4	2.2	0.01	0.4
Leather, Leather and Footwear	0.11	4.2	3.5	0.00	0.3
Wood and Products of Wood and Cork	0.08	6.8	6.2	0.01	0.3
Pulp, Paper, Printing and Publishing	0.39	4.2	5.2	0.02	1.3
Coke, Refined Petroleum, etc.	0.30	12.9	11.4	0.03	2.2
Chemicals and Chemical Products	1.44	7.0	6.4	0.09	5.9
Rubber and Plastics	0.29	6.9	7.6	0.02	1.4
Other Non-Metallic Mineral	0.16	3.6	5.5	0.01	0.6
Basic Metals and Fabricated Metal	0.93	6.4	8.0	0.07	4.8
Machinery, Nec	1.55	5.8	7.9	0.12	7.9
Electrical and Optical Equipment	1.39	5.8	6.7	0.09	6.0
Transport Equipment	1.79	8.1	8.1	0.15	9.4
Manufacturing, Nec; Recycling	0.24	7.9	8.8	0.02	1.4
Total manufacturing	9.72	6.5	7.2	0.70	45.5

Source: WIOD; authors' calculations.

[8] A decomposition analysis based on the Leontief framework over the period 1995-2011 suggests that the contribution of value added exports to GDP has been about 33%. The difference might be explained that in the above calculations value added coefficients and the global input-output structure are assumed to be constant.

1.7. POLICY IMPLICATIONS

This chapter provides rich evidence concerning the development of the EU's revealed comparative advantages and world market shares across a wide number of industries and quality segments. The long-term analysis presented in Section 1.2 indicates that the EU-28 has successfully defended its global market share since the 1990s despite the increasing importance of emerging countries, particularly China. This is particularly the case for industries that are characterised as "high tech", which perform better than others in terms of R&D intensity, productivity growth and above average wages per employed person. These industries comprise machinery, transport equipment, and chemicals. In these industries the EU-28 also managed to keep or even increase its strong position in world markets and specialisation. The only exception is the electrical and optical equipment industry which is characterised by relatively low world market shares and a comparative disadvantage. Nonetheless, taken together, the four industries account for about two thirds of EU-28 extra-EU exports. Other industries that perform well in international markets are pulp, paper, printing and publishing, and wood and wood products where the EU-28 has gained revealed comparative advantages, though their contributions to overall exports is rather low. This is also reflected in the contribution of these industries' to overall GDP.

With respect to future developments the world market share of the EU-28 is expected to decrease to about 18% from about 21% in 1995 based on the gravity model. However, these results suggest that the EU-28 export structure further shifts towards the high-tech industries in general. Specifically, a further increase in specialisation is expected for machinery and transport equipment with other industries amongst other smaller industries like pulp, paper and publishing and wood and wood products. The chemical industry is expected to keep its revealed comparative advantage position at a rather constant level. This is also the case for the electrical and optical equipment industry which is however characterised by a revealed comparative disadvantage. The results also suggest that EU-28 industries will be able to keep their strong position in the high unit value segments of world export markets. Finally, it is expected that the ongoing trends of agglomeration of manufacturing activities and exports will continue. The results in particular suggest that countries of the EU manufacturing core – and particularly the Central and Eastern European member states – will gain in importance for EU manufacturing exports.

The disaggregation of the manufacturing sector and the focus on individual industries is of key importance given that past and future trends as well as the EU's relative position vary considerably across these industries. This sectoral perspective has the advantage that more specific policy recommendations can be derived given that the requirements of industries are typically very heterogeneous. As Hausmann and Rodrik (2006) argue that the overwhelming majority of public inputs needed by firms are highly specific to their activity. The large number of specialised agencies and institutions in charge of regulating, advising or otherwise support firms is evidence of these specific needs. There may be complementary measures of a truly horizontal nature such as an endowment with appropriate skills and a respective educational and vocational training system, R&D policies, the exchange rate policy, or the completion of the Single Market that may be considered as key policy instruments to support the competitiveness of European industry. However, it is very doubtful that these measures alone are sufficient to meet the main challenges posed by an intensifying economic integration and the emergence of new players in the global trade arena (see e.g. Aghion et al., 2011). The broad findings of this report indicate that the major long-term challenges that were identified in the European Competitiveness Report 2013 (European Commission, 2013) are still relevant. The challenges identified in this previous report were: *(i)* defending current technological leadership positions (and therefore industrial leadership); *(ii)* the competitive pressure from emerging economies (which evolves differently across industries); *(iii)* the development of Europe's 'industrial commons' (Pisano and Shih, 2009) and *(iv)* responding to the growing agglomeration tendencies in manufacturing within the EU.

Support policies need to be tailored to the specific needs of an industry

Neither the Single Market nor any other horizontal measure will satisfy the needs of individual industries. There are industries which may be termed "sunset industries" in which the EU clearly is not revealing comparative advantages. These industries include, for example, the textile or the leather industry. In these circumstances policy needs to focus on niches in which European firms may still be successful in international markets. Typically, such niches can be occupied by technological leadership and quality advantages. Examples include various protective clothing within the textile industry.

A particularly special case is the electrical and optical equipment industry where the EU historically lacks comparative advantage. As shown in the report the revealed comparative disadvantage in this industry deepened between 1995 and 2013 and the situation is projected to further deteriorate until 2025. As one of the advanced manufacturing industries, the relatively weak position of the EU in this industry in comparison to the US or also Japan should give reason for some concern. As one of the most technology intensive industries, the electrical and optical equipment industry is the source of major innovation and technological progress. The digital revolution,

also termed "fourth industrial revolution" (or "industry 4.0") is likely to emerge primarily from this industry. Therefore neglecting this promising industry – i.e. not only being a user but also a competitive producer - based on the argument of a lack of comparative advantage would be risky to say the least. It would clearly imply a lot of missed opportunities because the EU has the technological potential to excel in this domain and there are a number of firms that excel in the development and production of electrical products.

Therefore, the European Electronics Strategy set up in 2013 can be considered as an important initiative to support an important branch of the European electrical industry. However, as often with EU initiatives, there is a risk that the funding will be largely insufficient in order to have a noticeable impact. While broad in scope with almost all Member States participating, the public impetus will be relatively small: the EU is expected to contribute EUR 1.2 billion hoping that Member States will match this amount. Clearly, a more determined policy would be warranted in this respect. Moreover, any supply side measures in this area need to be supplemented with demand side support for new and innovative products. This support could come in the form of public procurement measures in which governments and European institutions act as lead users (von Hippel, 1986; Edler and Georghiou, 2007).

Finally, for a large number of industries the RCA analysis suggests substantial comparative advantages. These are the well-known strongholds of European manufacturing including the machinery, the transport equipment and the chemical industry. For these industries the supporting innovation systems as well as the educational systems in many Member States seem to be well-functioning. Here the issue is mainly to ensure the quality of existing innovation support from the public domain but also to transfer successful institutional arrangements to other Member States. Moreover, what has been said with regard to demand side policies and public procurement also applies here as these industries are also high technology intensive and therefore also dependent on continuing demand.

Defining a common cause for industrial support measures

Despite the tailor-made policies for individual industries it is equally important that the EU develops a unified industrial strategy with a clear priority. Such a strategy, for example, exists in the US where large parts of manufacturing activities are part of (or depend directly on) the industrial-military complex. In the US, for a long time, the provision of a public good – defence – was directly linked to a felt societal challenge which was a confrontation with Russia. For the EU another public good may be more appropriate. Given the strong political commitment of the EU to environmental protection a long term industrial policy centred on the development of green technologies resulting in "clean" products would be a logical candidate, for example. Again, this industrial policy should not only include a long term funding commitment for research but also needs a reliable source of demand that should be provided by public procurement or other supporting initiatives of EU Member States. Several initiatives already go in this direction. One example would be the EU's ZeEUS project, a demonstration project for zero emission city buses in eight European cities. Initiatives like this clearly support the development of new technologies. What misses in Europe, however, is then a roll-out of such initiatives at a bigger scale.

Keeping value added generation within the European Union

Employment generation in the industrial sector will likely be a very difficult task given that competitive pressure will force European firms to keep on increasing productivity. Therefore labour intensity of European manufacturing must be expected to continue to decline. In order not to aggravate this trend, the framework conditions must be set with a view to maximising value added generation in European manufacturing within the boundaries of the Union. The EU is in some form well positioned in this respect as the international mobility of firms with regard to production location could be fostered across Member States. This would give firms a chance to benefit from efficiency gains related to offshoring. In contrast, the shift of existing production and other value added generation activities to countries outside Europe should be kept to a minimum by supporting measures of strengthening EU's competitiveness like the Single Market or the Services Directive.

Another important aspect in this respect is training and vocational training in particular. The cross-country analysis of export performance and other studies researching the performance of the manufacturing industries in Europe in general clearly indicates that the availability of both high-skilled and medium-skilled is an important factor. For many firms, employees and theirs skills are their most valuable asset because part of its technological and innovation capacity is embodied not in machinery and processes but in their workforce. This is important because workers are less mobile than companies and if technological capabilities are embodied in the workforce this represents a unique locational advantage. Moreover, it implies that a firm's technology is not fully transferable to other locations. If production strongly depends on specific skills of workers, a move to a low cost destination will not only imply cost-savings but also a decline in productivity.

This argument obviously calls upon Member States to implement the appropriate education and training policies which ensure that the required skills are available among European workers. In the context of manufacturing it is worth mentioning that such policies should not only target the high-skill segment of the workforce such as technicians. For manufacturing it is also the medium-skilled workers that are of crucial importance. Therefore particular attention should be paid to vocational training. A successful model of initial vocational training (IVT) is the dual system which is common in Germany and Austria. In this system, young people (after having completed 9 years of schooling) can enter a private-law vocational training contract with a company which typically has duration of 3 years. Actual training takes place mainly within the company but is supplemented with training at (part-time) vocational schools. Binding requirements in the training directives ensure a uniform standard concerning the training quality (Hippach-Schneider et al., 2007). Moreover, in-house training taking place at firms implies that apprentices gain highly specialised skills for which there is actual demand in industries. Therefore the set-up or expansion of such dual IVT systems in EU Member States would support European industry in global competition. After all, a well-trained workforce can be seen as a key element of the industrial commons which are a country's collective R&D, engineering, and manufacturing capabilities. As such it is also justified that both, the government and the private sector together contribute to investment in skills.

Coordination of (specific) activities within a Smart Specialisation Concept

The concept of smart specialisation offers a promising route for improving current productive assets and potentially also create new one (Foray et al., 2009). This concept is basically a bottom-up approach for regions to discover – in cooperation with existing industry representatives – which industries may be most promising. The value added of the smart specialisation strategy is the discovery of areas with latent comparative advantage. This approach also suggests focussing resources on a few activities within a region. In a way smart specialisation may be seen as the regional variant of the kind of industry specific policies suggested above. One thing that should be mentioned in this context is that there needs to be well-organised coordination of support activities in order to avoid a situation where all regions "jump on" the same industry/technology within their Smart Specialisation efforts.

It should also be mentioned that to some extent, even in the smart specialisation concept, the picking winner problem remains. This is an unavoidable feature of any active innovation and industrial policy that most promising areas or industries have to be selected. However, this is not much different from other policy areas because politics is always about setting priorities and a decision in favour of supporting one thing often implies a decision against the alternatives.

However, it might important that these Smart Specialisation efforts could help to overcome the existing tendency of a clustering of manufacturing activities in a few core countries or regions helping to spread manufacturing activities and maybe the value added-intensive activities of these and sectors related to these again more evenly across Europe. This is enabled by the rising importance of European Value Chains (EVCs) - as a part of the global value chains – allowing for finer-grained specialisation within specific value chains by countries and regions.

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