

III. Assessing the price and non-price competitiveness of the euro area

Countries' export performance is broadly affected by three types of factors: relative prices, dynamism of export markets and non-price competitiveness. This section discusses the limits of traditional measures like the real effective exchange rate in capturing price competition and then focuses on the other determinants of competitiveness. We show that specialisation in markets with more dynamic demand can be relevant in the short run, but on average what matters most is the combination of price factors and the other non-price factors. To shed more light on non-price competition, we introduce an indicator of export quality, which defines the quality of euro area countries' exports in relative terms vis à vis their main competitors. We show that growth in export quality is indeed positively related to the export performance of euro area countries. This suggests that further work is needed to better understand and disentangle the drivers of competitiveness, but also that a successful competitiveness strategy needs to take into account both price and non-price aspects⁽⁸⁹⁾.

III.1. Introduction

This section discusses the developments of euro area countries' export performance, with a focus on non-price competitiveness. External competitiveness is a broad concept and a variety of indicators would need to be used to assess it comprehensively. Nevertheless, the single aggregate measure of external competitiveness commonly used is the growth in export market shares ('EMS').

Broadly speaking, the disparity in export performance across countries can be explained by three types of factors: price competitiveness, dynamism of export markets and other non-price factors.

First of all, international competitiveness is affected by a **country's industrial costs relative to other exporters**⁽⁹⁰⁾. For this reason, cost/price factors have received a lot of attention from policymakers, analysts and researchers. When analysing the drivers of export performance on the price/cost side, the real effective exchange rate (REER) is often used as a summary measure. However, the REER gives only a partial view of the drivers of competitiveness, since it only focuses on the price side and has additional weaknesses, as discussed later in this section.

Second, the **strength of foreign demand** is also an important driver of export performance: other

things being equal, countries exporting in more dynamic geographic and product markets will see their EMS grow. However, as discussed later, this factor can be taken as exogenous, at least in the short run.

The available empirical evidence nonetheless shows that the two aforementioned traditional factors can only partly explain export performance. Thus, other factors shaping a country's competitiveness on the non-price side need to be also taken into account⁽⁹¹⁾. These factors, which encompass many of the facets driving export performance beyond prices and foreign demand, include: quality, tastes, participation in global value chains, logistics services and infrastructure in general, and institutional factors such as EMU membership⁽⁹²⁾.

Against this background, this section discusses the export performance of the euro area, distinguishing between cost- (price-) and non-cost (non-price) competitiveness and focusing especially on the latter. In Sub-section III.2 we present some stylised facts on export market share growth in the euro area in the period 2001-2015. Sub-section III.3 focuses on price competitiveness, discussing challenges to its 'correct' measurement and the weaknesses of the REER. Sub-sections III.4 and III.5 focus on non-price competitiveness. Sub-section III.4 presents a standard, very intuitive, shift-share decomposition of export market share growth. The purpose is to separate the effect of

⁽⁸⁹⁾ This section was prepared by Gaetano D'Adamo. The author wishes to thank Kristian Orsini for constructive and useful comments on this section.

⁽⁹⁰⁾ See also Kaldor, N. (1971), 'Conflicts in national economic objectives', *Economic Journal*, Vol.81, 1-16.

⁽⁹¹⁾ See, for example, Benkovskis, K. and J. Wörz, (2014), 'What drives the market share changes? Price versus non-price factors', *Working Paper Series*, 1640, European Central Bank.

⁽⁹²⁾ See Monteagudo, J. (2010), 'Assessing the sources of non-price competitiveness in the euro area', *Quarterly report on the euro area*, Vol. 9, No 2.

specialisation and foreign demand from the underlying export performance. Sub-section III.5 presents an indicator of export quality based on Vandebussche (2014) and analyses its relationship with euro area countries' export performance. Sub-section III.6 provides the conclusions.

III.2. Stylised facts on EMS growth

As a first step to assess how euro area countries' export competitiveness has developed recently, this sub-section presents developments in euro area countries' EMS over the period 2001-2015. The focus is on three sub-periods: pre-crisis (2000-2008), crisis (2009-2012) and 'adjustment' (2013-2015)⁽⁹³⁾. The aim is to verify whether a common pattern can be identified, at least within groups of countries, which could feed into the discussion that follows.

Table III.1: **Average annual EMS change rate in sub-periods (1)**

Country	2001-2008	2009-2012	2013-2015
Austria	1.09%	-5.68%	0.57%
Belgium	0.08%	-5.15%	-0.13%
Cyprus	-3.55%	-1.70%	6.40%
Estonia	5.05%	5.18%	-5.20%
Finland	-1.95%	-9.75%	-3.17%
France	-2.81%	-5.38%	5.03%
Germany	0.91%	-4.58%	1.67%
Greece	2.25%	-0.23%	-3.70%
Ireland	-5.06%	-6.48%	6.10%
Italy	-1.28%	-5.50%	0.53%
Latvia	9.84%	5.73%	0.23%
Lithuania	13.01%	4.20%	-1.50%
Luxembourg	-1.56%	-9.10%	0.77%
Malta	-8.45%	17.50%	-19.10%
Netherlands	0.39%	-3.18%	-1.90%
Portugal	-0.29%	-3.10%	1.90%
Slovakia	12.24%	-0.09%	1.57%
Slovenia	4.03%	-5.59%	2.99%
Spain	-0.20%	-3.12%	2.66%

(1) EMS are calculated as the share of a country's exports (both within and outside the euro area) in total world imports.

Source: UN Comtrade and DG ECFIN calculations.

Table III.1 shows the total percentage change in EMS for euro area countries in the three sub-

⁽⁹³⁾ There might be differences between countries in the definition of the sub-periods: for example, for some countries, 2013 was still a crisis year. The figures therefore give only a general indication of the situation.

periods mentioned above. The table shows some important stylised facts. First, in the **pre-crisis period**, 10 euro area countries out of 19 gained EMS. These gains were particularly concentrated in central and eastern European countries, which showed the highest EMS increases. This is mostly due to increased trade with the rest of the EU due to EU membership and access to the single market⁽⁹⁴⁾. Moreover, while most 'core euro area' countries (Austria, Belgium, Germany, and the Netherlands) also gained EMS, this was not the case for Italy and France. Finally, Greece also gained EMS while losses were quite small for Portugal and Spain, which confirms the view that poor export performance was not at the root of the well-known accumulation of external imbalances in those three countries.

Second, turning to the **crisis period**, the picture is in some sense reversed: the large majority of countries lost market share (except for Estonia, Latvia, Lithuania and Malta). This was largely due to the depth of the crisis in the EU, which is the main export market for euro area countries, as will be discussed in sub-section III.4.

Third, focusing on the **adjustment period** (the last column of Table III.1), the picture has somewhat improved, with 12 countries out of 19 having gained EMS. Among them are some euro area countries heavily hit by the crisis (Cyprus, Portugal, Spain and, to a lesser extent, Italy). This suggests that a good export performance has contributed to the rebalancing process in these countries. In spite of some common factors (as mentioned for the crisis period), euro area countries' export performance differed widely from country to country. The following discussion aims to shed light on these differences and open the way for more in-depth analysis.

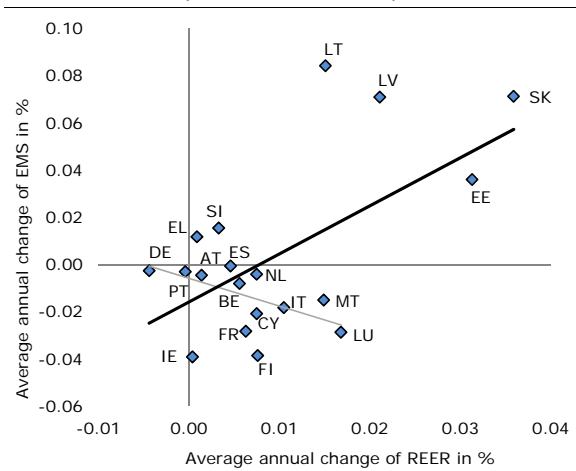
III.3. Measuring price competitiveness: a challenging task

The most common summary measure of drivers of price (or cost) competitiveness is the real effective exchange rate (REER). The reason is simple: REER data are widely available and generally updated in a timely way and the concept is also well-known to many non-experts. However,

⁽⁹⁴⁾ This is especially the case for Lithuania, Latvia, Slovakia and Slovenia, where the pre-crisis increase in EMS was mostly due to an increase in their intra-EU EMS.

measuring price competitiveness simply by using the REER can lead to results that are, to some extent, counterintuitive: the stylised fact that the industrial countries' growth in EMS was sometimes found to be uncorrelated or even *positively* correlated to their growth in unit labour costs (ULCs) or relative prices gave rise to what is known as the '*Kaldor Paradox*'. One explanation for this paradox is that higher prices might actually reflect higher quality which, in turn, might imply higher wages, as we will discuss in sub-section III.5⁽⁹⁵⁾. As a result, cost competitiveness per se should not be seen as the only determinant of trade performance, especially for countries that export more diversified, high-quality goods and for countries that are undergoing a rapid process of integration with international markets.

Graph III.1: REER and EMS average annual change in the euro area (1)
(2001 – 2014, in %)



(1) The black line is the trend line for the whole euro area. The grey line is obtained by excluding EE, LV, LT and SK. Source: AMECO, UN Comtrade and DG ECFIN calculations

Observing data from euro area countries gives some idea of the issue. Graph III.1 below plots the average annual change in export market shares in euro area countries in the period 2001-2014 against the average annual real appreciation or depreciation. Export market shares are calculated using data from Comtrade and therefore only cover manufacturing exports. The real effective exchange rate is the one based on unit labour costs. As shown in Graph III.1, including all 19 euro area countries, the relationship between REER and EMS growth seems to be positive, as shown by the

black line. However, this is due to the strong export performance registered by four catching-up central and eastern European countries, i.e. the Baltic states (Estonia, Lithuania and Latvia) and Slovakia, despite the fact that their REERs have appreciated substantially. When we drop these four outliers, the correlation is negative, as shown by the gray line and as one would expect at the outset, although far from one ⁽⁹⁶⁾.

In sum, the relationship between the REER and EMS growth is often weak, and this is due to country-specific factors that have to be taken into account. The weakness of this relationship is, however, also due to the fact that the REER is constructed based on some very restrictive assumptions. First of all, weights derived from gross trade data ignore the importance of vertical integration in trade⁽⁹⁷⁾. This means that changes in the price basket would have the same effect on the REER whether it is for a final good or an intermediate good. However, at the outset we would expect that the price elasticity of demand would be lower for intermediate goods⁽⁹⁸⁾. Moreover, the REER assumes that changes in the price of goods of foreign competitors have the same impact on the index, but in practice this is unlikely to be the case. For example, this assumption implies that the elasticity of substitution between German and Italian cars is the same as the elasticity of substitution between German cars and cars produced in any other country of the world⁽⁹⁹⁾. This is a very strong assumption, which translates into the fact that, on the basis of the REER, the relevance of a country (or a good) in price competition is only related to its weight in other countries' exports. This critique is valid for all commonly used measures of the REER, such as the ULC-based and the export prices-based REER.

The critique of the restrictive assumptions at the basis of the REER have resulted in a sub-category

⁽⁹⁵⁾ See also Fagerberg, J. (2002), 'Technology, growth and competitiveness', selected essays. Cheltenham, UK, Edward Elgar.

⁽⁹⁶⁾ Excluding Estonia, Lithuania, Latvia and Slovakia, the correlation is equal to -0.40 over the period 2001-2014.

⁽⁹⁷⁾ Vertical integration implies that different stages of the production of a good are performed in different countries. In this case, the exported good is therefore not entirely domestically produced.

⁽⁹⁸⁾ For example, for economies at the end of the production chain, some imports (components) and exports (final goods) become complements. In this case, the depreciation of the home currency does not necessarily lead to a decrease in imports.

⁽⁹⁹⁾ For a discussion of this, see Spilimbergo, A. and A. Vamvakidis (2003), 'Real effective exchange rate and the constant elasticity of substitution assumption', *Journal of International Economics*, 60(2), 337-354.

of literature aimed at producing REER indicators that are not subject to the same type of assumptions. For example, studies have been produced that try to better account for vertical integration and global value chains and the sectoral dimension⁽¹⁰⁰⁾. However, these new and promising REERs are not yet available on a systematic basis.

Estimates of the elasticity of exports to the real exchange rate vary quite a lot in the literature and across countries. In particular, for the euro area, recent estimates⁽¹⁰¹⁾ suggest that the long-term elasticity of exports to the REER is close to 0.8 in absolute value. However, the ‘true’ price elasticity of exports might actually be underestimated by the REER. When micro data are used, estimated export elasticities are in fact substantially higher⁽¹⁰²⁾. For example, in Imbs and Méjean (2010), estimated export elasticities range between 0.9 and 2.25 depending on the countries considered (rich open economies tend to post low absolute values, whereas developing countries have higher estimates)⁽¹⁰³⁾. Where does this large cross-country variation in responsiveness of exports to prices come from? The response is in the microeconomic structure of the economies and in the nature of the goods exported. Recent work in this area using firm-level data has shown that the elasticity of exports to exchange rate changes is substantially different across firms and is related to firm size and productivity. In particular, smaller firms have a price elasticity of exports that is up to four times as big as that of large firms; similarly, the export price elasticity of the least productive firms is almost three times as big as that of the most productive ones⁽¹⁰⁴⁾. Finally, the demand for goods that are more diversified and of higher quality will most certainly react less to price changes. This discussion shows that measuring

price competitiveness is a complex task, and that using the right measure and level of disaggregation are equally crucial in order to assess how far it affects export performance.

III.4. A shift-share decomposition of export market share changes

As anticipated in the introduction, one additional factor affecting export performance is the type of specialisation. This is rather the result of a favourable composition of a country’s export basket, which means that the country is exporting products that have more dynamic demand than the average, and/or it is exporting to countries which are particularly dynamic. For this reason, as stated in the introduction, the contribution of this factor to export market share growth is exogenous, at least in the short run, and should be analysed separately⁽¹⁰⁵⁾.

A more precise account of export performance therefore has to distinguish between the specialisation component and the underlying performance component. To illustrate this, this sub-section contains a decomposition of export market share growth using a shift-share approach⁽¹⁰⁶⁾. In particular, we employ two types of shift-share decompositions: geographical decomposition and sectoral/product decomposition (see Box III.1 for the technical details). The decomposition will also enable us to identify the relative importance of these two components.

In the geographical decomposition, EMS growth is broken down into two parts: a country’s **initial geographic specialisation (IG)** and a country’s **market share gain in geographical markets (MSGG)**. IG measures the dynamism of destination markets or the extent to which export performance is driven by a favourable geographical specialisation of exports. A destination country is considered ‘dynamic’ if its total imports grow faster than world imports. The other component, MSGG, measures how a country performs in its

⁽¹⁰⁰⁾ Some recent examples are Bems, R. and R. C. Johnson (2012), ‘Value-added exchange rates’, NBER Working Papers, No 18498 and Patel, N., Z. Wang, and S. J. Wei (2014), ‘Global value chains and effective exchange rates at the country-sector level’, *NBER Working Papers*, No 20236; for sectoral REERs, Mehrez G., L. Fernández Vilaseca and J. Monteagudo (2014), ‘A competitiveness measure based on sectoral Unit Labour Costs’, *Quarterly report on the euro area*, Vol. 13, No 2.

⁽¹⁰¹⁾ See Balta, N., K. Fischer, P. Nikolov and L. Vilmi (2014), ‘Member States’ vulnerability to exchange rate changes’, *Quarterly report on the euro area*, Vol. 13, No 3.

⁽¹⁰²⁾ See Berthou, A. and F. di Mauro (2015), ‘Exchange rate devaluations: when they can work and why’, <http://voxeu.org/article/exchange-rate-devaluations-when-they-can-work-and-why>.

⁽¹⁰³⁾ Imbs, J., I. Méjean (2010) ‘Trade elasticities: a final report for the European Commission’, *European Economy Economic Papers*, No 432.

⁽¹⁰⁴⁾ See Berthou, and di Mauro (2015), cit.

⁽¹⁰⁵⁾ As time passes, however, exporters might redirect their products to more dynamic countries, or specialise in more dynamic products. Therefore, in the long run, geographic and product specialisation are endogenous.

⁽¹⁰⁶⁾ See Irigoyen, J.M., J. Monteagudo and A. Rutkowski (2012) ‘A closer look at some drivers of trade performance at Member State level’, *Quarterly report on the euro area*, Vol.11, No 2. For a similar approach, see also Cheptea, A., G. Gaulier and S. Zignago (2005), ‘World Trade Competitiveness: a disaggregated view by Shift-Share analysis’, *CEPII Working Paper*, No 2005-23.

Box III.1: Decomposition of EMS

The growth rate of the export market share is defined as

$$g = \frac{g^e - g^*}{1 + g^*} \tag{B.1}$$

Where g^e is the country's export growth rate and g^* is the world import growth rate (proxied by global exports). A positive value indicates that the country is increasing its global market share. A negative value means that its global market share is decreasing. Two approaches for the decomposition of export market share growth are used here: a geographical decomposition and a product (or sectoral) decomposition.

Geographical decomposition

$$g = \frac{\sum_i w_i^e (g_i^* - g^*)}{1 + g^*} + \frac{\sum_i w_i^e (g_i^e - g_i^*)}{1 + g^*} = g_{IG} + g_{MSGG} \tag{B.2}$$

where w_i^e is the share of exports from country e to destination country i in total exports of country e at the beginning of the period, g_i^e is the growth rate of exports from country e to destination country i (of all products), and g_i^* is the growth rate of total imports of destination country i (proxied as global exports to country i).

Product Decomposition

$$g = \frac{\sum_s w_s^e (g_s^* - g^*)}{1 + g^*} + \frac{\sum_s w_s^e (g_s^e - g_s^*)}{1 + g^*} = g_{IP} + g_{MSGP} \tag{B.3}$$

Where w_s^e is the share of exports from country e in sector s in total exports of country e at the beginning of the period, g_s^e is the growth rate of exports from country e in sector s (to all destinations), and g_s^* is the growth rate of global imports (proxied by exports) in sector s.

Interpretation of the EMS decompositions

In both decompositions, the total growth in export market share is divided into two components: the dynamism of the destination markets (g_{IG}^e ; g_{IP}^e) and the performance in the destination markets (g_{MSGG}^e ; g_{MSGP}^e).

The former is an 'exogenous' component because a country's EMS can grow or fall because total imports in its destination markets (from a geographic or product point of view) grow more or less than world imports, and that depends on product-specific or partner country-specific demand factors.

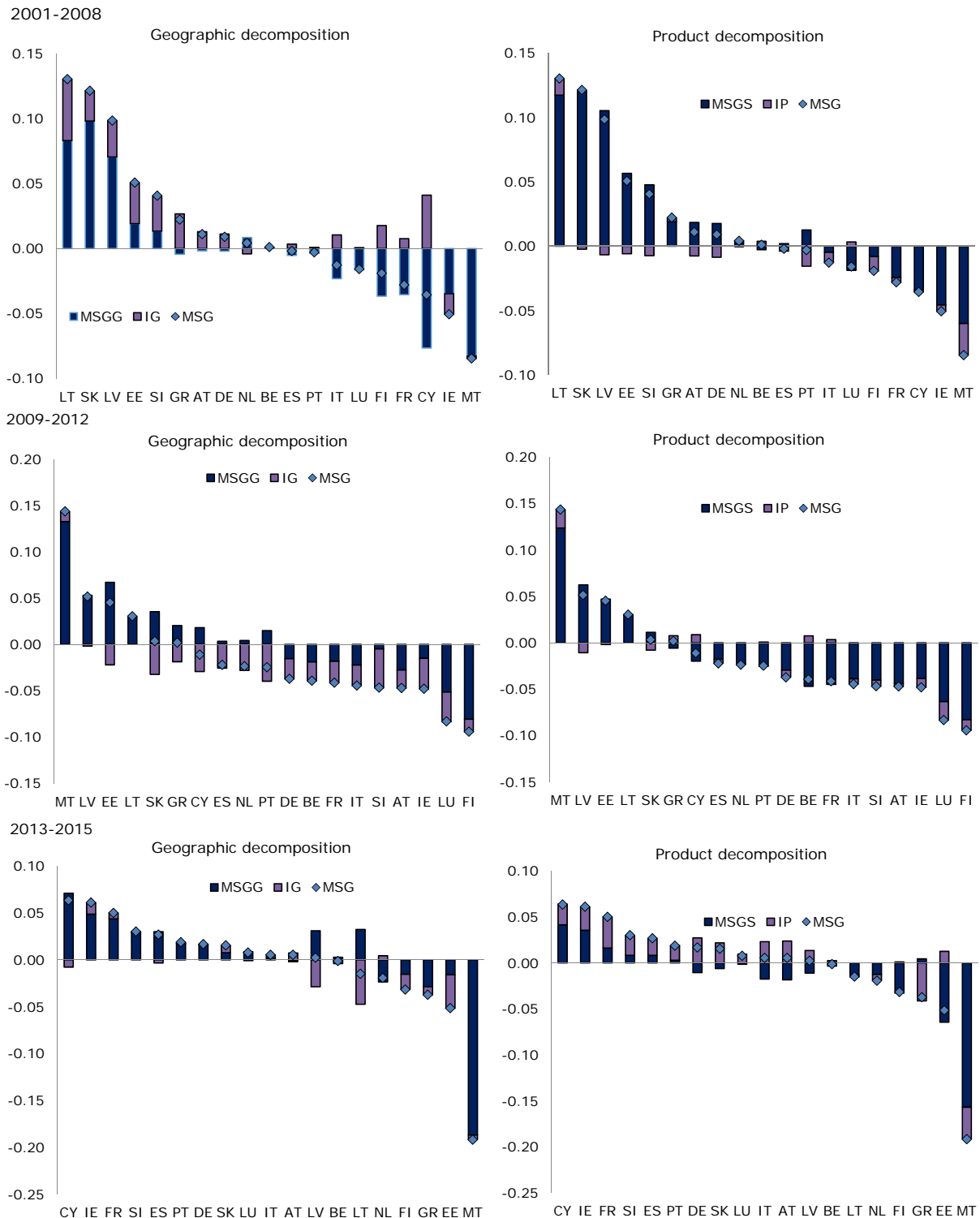
The latter is an 'endogenous' component because a country's total EMS can grow or fall because its EMS within its destination markets (from a geographic or product point of view) grows or falls, i.e. it performs better or worse than its competitors.

individual geographical destinations, i.e. how successful a country has been in lifting its export growth above market growth in destination countries. MSGG is therefore affected by both price and non-price competitiveness drivers of exports.

Similarly, in the sectoral/product decomposition, EMS growth can be split in two components, the **initial product specialisation (IP)** and **market share gains in product markets (MSGP)**.

Similarly to what was discussed above, IP measures the dynamism of destination markets or the extent to which export performance is driven by a favourable product specialisation of exports. MSGP shows then how successful a country has been in gaining market shares on average across the products' markets.

Graph III.2: Shift-share decomposition of EMS growth (1)
(2001 - 2015)



(1) MSG= average annual market share gain; IG= change in EMS due to dynamic geographical specialisation; MSGG= market share gain within geographical markets; IP= change in EMS due to dynamic product specialisation; MSGP= market share gain within product markets. See Box III.1 for details.

Source: UN Comtrade and DG ECFIN calculations

The initial specialisation terms (i.e. IG and IP) are driven by foreign demand, while the market share gain, or 'performance', terms (i.e. MSGG and MSGP), reflect other forms of competitiveness.

This latter component can be seen as the outcome of a country's firms' export strategy within geographical or product markets, e.g. competitive or non-competitive prices, sufficient or insufficient customisation to local tastes and high or low quality of products.

In order to calculate export market shares and perform the shift-share decomposition, annual data on exports from the UN Comtrade database for all the available 2-digit HS product categories are used. Graph III.2 shows the average annual growth in EMS for each euro area country in the three sub-periods identified in sub-section III.2, i.e. 2001-2008, 2009-2012 and 2013-2015. First of all, the total change in EMS is mostly explained by the 'performance' components, i.e. MSGG (in the geographic decomposition) and MSGP (in the product decomposition), and this is relatively more the case in the product decomposition⁽¹⁰⁷⁾. Using a back-of-the-envelope calculation, MSGG explains on average about 75 % of total EMS changes in the geographical decomposition across the sub-periods, while in the product decomposition MSGP explains about 85 %.

Second, the relevance (and the sign) of the dynamism of geographic and product markets (i.e. IG and IP) is quite different in each sub-period. This reflects the fact that specialisation does indeed change over time due to firms' export strategies. In the crisis period, while the performance components (MSGG and MSGP) still explain the bulk of export performance on average, the specialisation components were more relevant than in the previous period. In particular, the initial geographic specialisation explains about 40 % of total export market share gains or losses during the crisis and is negative for 16 countries out of 19. This reflects, in most cases, the depth of the crisis in the EU, which is the main destination market for euro area countries' exports. Focusing on the period 2013-2015, it is interesting to see that the product specialisation not only contributed positively to EMS growth for 13 countries out of 19, but also accounts for about 43 % of total EMS changes. While a detailed explanation of the causes of this goes beyond the scope of this article, it may signal that in the post-crisis scenario euro area

firms were able to reposition themselves by exporting products with more dynamic demand.

In what follows, we focus on the 'performance' component of export market share growth (i.e. MSGG and MSGP), keeping in mind that it captures both price and non-price competitiveness. In particular, in the next sub-section we introduce some indicators of non-price competitiveness based on export quality and related to this 'performance' component.

III.5. Export quality and trade performance

We mentioned in the introduction that non-price competitiveness is a broad concept which encompasses many different determinants of export performance in addition to the specialisation effects previously discussed: export quality, tastes, integration in global value chains and institutional factors. In this sub-section, the focus is on one of these determinants, presenting an indicator of export quality that is based on Vandenbussche (2014), and showing how quality improvements indeed seem to be related to gains in export market shares⁽¹⁰⁸⁾.

Why is quality important? The simple answer is that it is the other side of the coin of costs when looking at export prices. While changes in both production costs and quality would affect prices in the same direction, there is one key difference between them. When production costs increase, prices increase too (unless the producer can decrease its profit margins). Other things being equal, this will reduce the demand for the good (i.e. it will cause a movement along the demand curve). By contrast, when quality increases the price of a product could also rise, but this will not necessarily mean a decline in demand (i.e. there will be a shift of the demand curve)⁽¹⁰⁹⁾. The overall effect on demand will therefore depend on the interplay of income and substitution effects.

It should be clear from this short discussion that identifying the quality of a good with its price can be misleading, because a higher price might reflect higher costs instead of higher quality. Against this

⁽¹⁰⁷⁾ The available data do not allow us to combine the product and geographical decompositions, which are therefore presented separately in Graph III.2.

⁽¹⁰⁸⁾ For a description of the theoretical model and the empirical approach, see Vandenbussche, H. (2014), 'Quality in exports', *European Economy Economic Papers*, No 528.

⁽¹⁰⁹⁾ However, in some cases quality improvements may result in price decreases, in particular if they contribute to reducing production costs.

Box III.2: A measure of export quality

The calculation of the indicators of export quality used in this chapter is based on the theoretical background and empirical approach described in Vandenbussche (2014).

Quality indicators are constructed using data coming from two sources. First, we use Comext (Eurostat) trade flows at product (CN8) level to obtain unit values as a proxy for prices. Second, we use information from the firm-level dataset ORBIS to obtain a proxy for country-product costs.

In the empirical analysis, only the CN8 products for which sufficient information on the cost side is available, exported to the EU market (EU-28) by each European member state, and by China, the US and Japan, are considered. This results in 31 countries of origin whose export products we can compare within the same product market and results on average, in about 6 000 exported products for each EU Member State and its main world competitors, i.e. the US, Japan, China.

To construct this set of quality indicators, we compute for each product (CN8) exported by a country to the EU market, its normalised quality rank based on the method explained in Vandenbussche (2014) and outlined in this section. In each narrowly defined product category (CN8), exports of 31 countries of origin (EU Member States, the US, China, Japan) exporting to the EU are compared. A quality rank of 1 reflects the highest quality in the EU market for a particular ‘country of origin-product’, while a rank of 0 is the lowest quality rank. It is important to note that when assigning a quality rank to a product, we also consider the number of other countries exporting the same product.

To obtain a country-product cost measure, the 4-digit NACE Rev. 2 primary Industry classification of ORBIS for firms in the country of origin is first matched with the CN8 product classification (via CPA codes) to which a particular product belongs, in order to have an idea of the cost of each exported product. Our cost data are variable costs data, consisting of both wage costs and material costs. Due to different accounting practices and data availability, for some countries the cost of goods sold was used instead of wage costs and material costs. This was the case for China, Cyprus, Denmark, the UK, Greece, Ireland, Japan, Lithuania, Malta, the US, Latvia and Netherlands.

One caveat is that ORBIS does not report all the very small firms and thus has a bias towards larger firms. However, since exporters tend to be larger firms, we expect variable costs estimates coming from this data to be a good proxy. To take this potential bias into account, the variable cost of the median firm in the sector is considered as a proxy for the costs of all the CN8 products that map onto this industry classification. Arguably, the median is less influenced by outliers than the average. Thus, for each country in our sample (all EU countries, the US, China and Japan) and for each 4-digit NACE sector that CN8 products map onto, the cost level of the median firm for that country-sector is taken to be a proxy for the marginal cost of a country-product variety exported by that particular country. The indicators are based only on CN8 products that map onto the NACE-R2 in manufacturing (sectors 10 to 32).

background, the indicator presented in this subsection measures quality in the following way:

first of all, for a narrowly-defined product category, the mark-up over production costs is calculated for firms in a specific country;

second, within a specific product and destination market, a quality rank is established, i.e. products are ranked from the highest to the lowest mark-up.

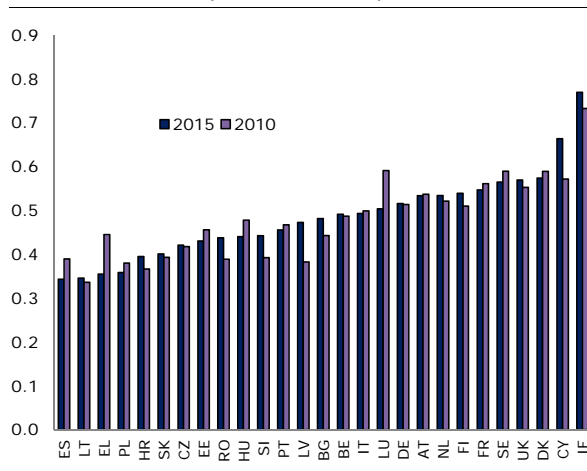
The underlying assumption is that for very similar products in a competitive environment, if a producer is able to extract a higher mark-up, this means that the quality of its products is higher.

The quality indicator takes values from 0 (lowest possible quality, relative to the other countries) to 1 (highest possible quality). The indicator is therefore of a purely ordinal nature⁽¹¹⁰⁾. The data then allow us to calculate, for each country, the average quality rank of its exports (i.e. a measure of the ‘aggregate’ export quality calculated as an average rank across all destinations and all products), and the distribution of exports across quality ranks, from low quality (i.e. with an average rank below 0.2) to top quality (average rank above 0.8).

⁽¹¹⁰⁾ Box III.2 summarises the data sources and the methodology for the calculation of the quality indicators.

Graph III.3 shows the average quality rank of euro area countries, comparing, for illustrative purposes, the situation between 2010 and 2015⁽¹¹⁾. Average export quality declined in Spain, Greece, Estonia and Luxembourg and, to a lesser extent, in Austria, Portugal, Italy and France. A fall in the average export quality rank can either be due to a worsening of the quality of exported products or to a composition effect, where the volume of total exports increases due to higher exports of low-quality products, and thus their share increases.

Graph III.3: **Average export quality rank of euro area countries (1)**
(2010 and 2015)



Source: DG ECFIN calculations based on Comext (Eurostat) and ORBIS data

Do changes in quality affect export performance? In Graph III.4 quality improvements are plotted against the market share gains in both geographical and product markets, MSGG and MSGP, which were introduced in sub-section III.4. To do so, two measures of quality improvements are used: the (annual) change in the average quality rank and the (annual) change in the share of exports in the top quality rank (i.e. percentage of exported products with an average rank above 0.8, based on their value).

As the trend lines show, the correlation is indeed positive⁽¹²⁾. In spite of the presence of some dispersion around the trend, this positive correlation is confirmed when we exclude the four ‘catching-up outliers’ identified in sub-section III.4,

i.e. Slovakia, Estonia, Latvia and Lithuania. There is nonetheless some inertia in the quality indicators, that is, they tend to change little over time, which makes it more difficult to capture their impact on exports.

Moving forward, a simple econometric analysis is performed to corroborate the descriptive result showed in Graph III.4. Using annual data at country level, the ‘performance’ component of the shift-share decomposition (in particular, MSGP) is regressed on the change in the quality indicators, controlling for the (lagged) growth rate of the REER. However, as discussed in sub-section III.3, the REER has a number of limitations and might actually underestimate the importance of price competitiveness. Results are reported in Table III.2.

Table III.2: **Quality, real exchange rate and export performance**

	Average Quality Rank	Share of exports in the top quality rank
DREERT-1	-0.359*** (0.140)	-0.370*** (0.139)
DOQUALITY	0.213* (0.122)	0.178** (0.076)
Country Fixed Effects	Yes	Yes
N. Obs.	134	134
R-squared	0.09	0.1

(1) Dependent variable is the market share gain in product markets (MSGP). The sample period is 2006-2015, since data on quality is available only from 2005. Robust standard errors are in parenthesis.

Source: AMECO, ECFIN and author’s calculations

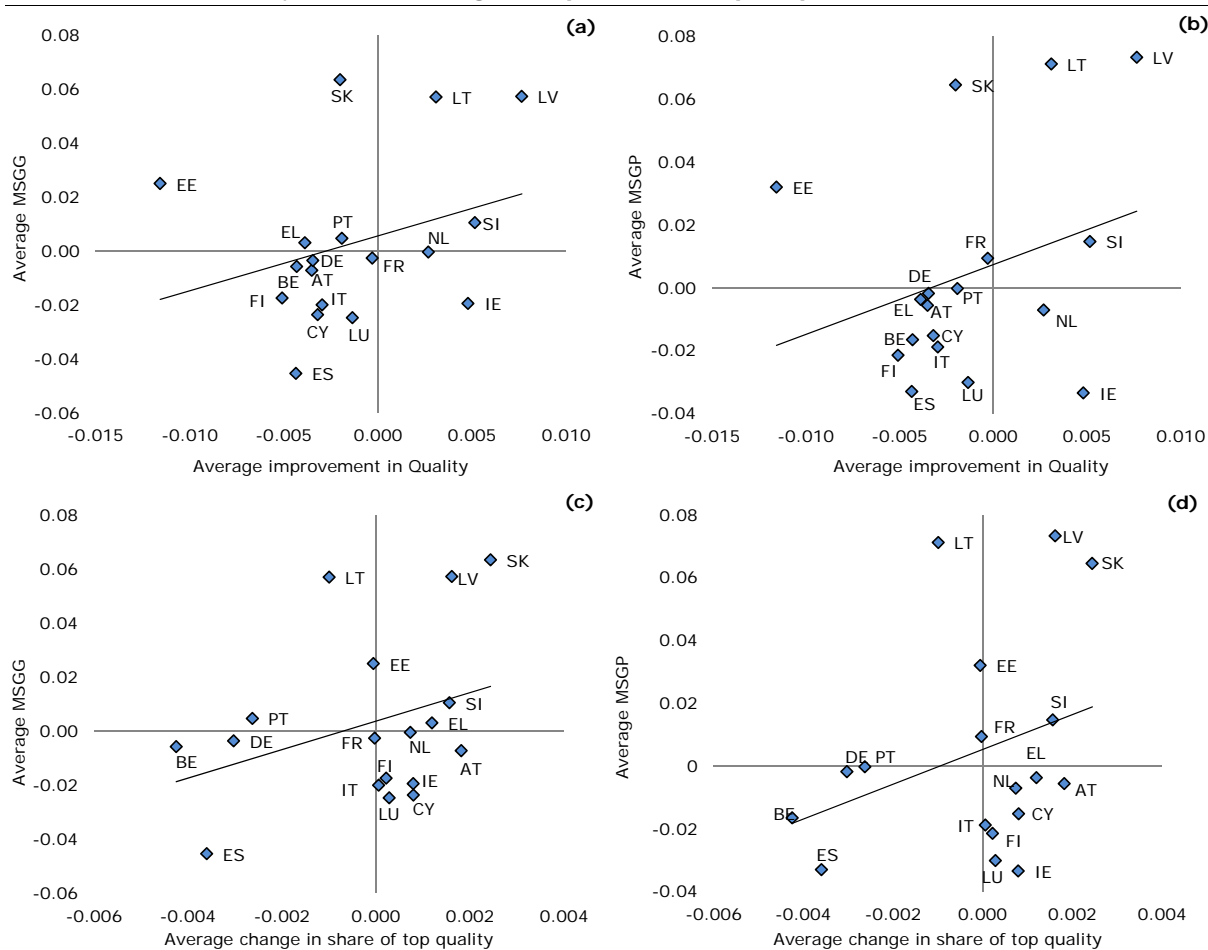
The descriptive results displayed on a cross-sectional basis in Graph III.4, are confirmed in the regression results in Table III.2, where quality improvements (defined as either an increase in the average export quality or an increase in the share of exports in the highest quality rank) are positively related to export performance⁽¹³⁾. At the beginning of this sub-section, we mentioned that increases in quality, despite pushing prices up, may have a positive impact on export performance as they shift the demand curve outwards. While a more thorough analysis would require the empirical analysis to be performed at a more disaggregated

⁽¹¹⁾ Since year-by-year changes are generally not large, it makes more sense to compare quality developments in the medium term.

⁽¹²⁾ The correlation ranges from 0.30 (in the case of MSGP and the average quality rank growth) to 0.34 (MSGG and increase in the share of top quality exports).

⁽¹³⁾ Results are confirmed when using the export price REER and the consumer price index-based REER instead of the ULC-based REER. Moreover, they are also confirmed when using, for the share of exports in the top quality rank, an estimator based on the number of products exported in each quality rank instead of their value, which should rule out potential sources of endogeneity.

Graph III.4: Quality of exports and export performance



(1) increase in the average quality rank plotted against market share growth in geographical markets (MSGG, panel (a)) and in product markets (MSGP, panel (b)); increase in the share of top quality exports plotted against market share growth in geographical (panel (c)) and product market (panel (d)).

Source: ORBIS, Comext, Comtrade, ECFIN calculations

level, these results appear promising and corroborate this hypothesis⁽¹¹⁴⁾.

III.6. Conclusions: towards an accurate measurement of price- and non-price competitiveness

This section has discussed some of the factors that might be at the root of the differences in export performance across euro area countries since 2001. Challenges in measuring cost/price competitiveness were highlighted. While a negative relationship can be observed between real exchange rate appreciations and export performance in the euro area, the weaknesses of the REER that have been discussed in this section

suggest that it might not fully capture the importance of price competition. Further work in this direction, using highly disaggregated data, is therefore of crucial importance.

Despite the diversity in the specialisation of euro area countries' exports, both price- and non-price competitiveness appear to matter. From a normative perspective, this implies that a successful export strategy has to take both aspects into account. On the one hand, real devaluation could be the best short-term strategy in countries with large imbalances and having also experienced wage increases that are not in line with productivity (although this would not necessarily be the best strategy to gain competitiveness in a sustainable, long-run way). This is especially true for countries exporting less diversified goods and, more generally, goods with more price-elastic demand. On the other hand, non-price competitiveness

⁽¹¹⁴⁾ Empirical work is currently ongoing to investigate more deeply the quantification of the role of non-price factors in affecting export performance in euro area countries.

plays a crucial role, especially for countries with lower price elasticity of exports. In particular, addressing weaknesses in non-price determinants of exports and investing in quality improvements can both increase exports and make them less sensitive to relative price changes.

Robust measurement of these different components of competitiveness and their impact on trade performance is important from a policy perspective. Hence more empirical work is needed, at a highly disaggregated level.