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CROWDING-OUT OR CO-EXISTENCE?

THE COMPETITIVE POSITION OF EU MEMBERS AND CHINA IN GLOBAL MERCHANDISE TRADE

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ABSTRACT

In this paper, we analyze export competition between individual EU Member States and China in third-country goods markets. We find that competitive pressure from China is strongest for small and peripheral EU members, especially for the Southern periphery, Ireland and Central, Eastern and Southeastern European EU members. While we find no hard evidence for “cut-throat” competition between China and EU countries, we see an increasing tendency of smaller EU exporters leaving markets that are increasingly served by China. We base our findings on traditional market share analysis, the exploration of intensive versus extensive margin export growth and on a Dynamic Trade Link Analysis. The latter, a newly developed tool, identifies different types of competitive pressure at the detailed product-destination market level. We use UN Comtrade data at the highest level of disaggregation (6-digit HS) for 75 world exporters and importers over the period 2000–2011.

Keywords

Competitiveness, trade links, sectoral market shares, extensive margin, European Union, China

JEL codes

F14, F15, O57

NON-TECHNICAL SUMMARY:

Over the last decade, China was the most successful player in world trade. Between 1999 and 2010, its export market share increased from about 4% to more than 12%. This shift in world market shares raises the question on how well European producers withstood competition in third markets from China over the past decade. To tackle the issue, we analyze to what extent Europe managed to conquer new markets in light of heightened competition from China. We examine to what extent European producers were driven out of their traditional export markets by analyzing market shares and the extensive and intensive margin of trade growth. In addition, we apply the Dynamic Trade Link Analysis developed by Silgoner et al. (2013). It investigates specific merchandise market segments for pairs of exporters (each individual EU country versus China) over time in order to identify the winners and losers of China's emergence on the global trade market. Using highly disaggregated trade data from the UN Comtrade database, we arrive at the following main findings:

- The euro area has become an important export destination for China during the past decade and as such is now at par with the U.S.A. By contrast, China continues to play only a minor role as an export destination for most EU exporters.
- Export growth of EU countries was mostly fueled by the deepening of existent trade relationships rather than by the exploration of new sectoral or geographical export destinations. Within the euro area, the introduction of the common currency also generated new trade links, including spillover effects to non-euro area EU countries. On the other hand, joining the EU opened up new markets in the case of the ten countries from Central, Eastern and Southeastern Europe (CESEE) that became members in 2004 and 2007 (CESEE-10: Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia). For those countries new trade relationships have been more important for their export growth than for the EU periphery (Greece, Ireland, Portugal, Spain, Italy), the core EU countries and even China, which had already established many new trade relationships in the 1990s, i.e. prior to the time period we are covering.
- During the economic and financial crisis, all countries suffered from a substantial decline in exports. What happened was that countries reduced the size of existing trade relationships rather than cutting off active export relationships altogether.
- At the sectoral level, it turns out that the share of capital goods and transportation equipment in total exports strongly increased in the CESEE-10 and China between 2000

and 2010, which indicates more direct competition in these merchandise categories. By contrast, these two categories lost importance for the core EU countries, which may point to potential cut-throat competition. Industrial supplies remained the most important merchandise category for the core EU countries, while losing importance in the CESEE-10 countries in terms of export market shares. Nevertheless, the CESEE-10 managed to establish a relatively large number of new trade relationships in this export category. During the global financial crisis, many of these trade links were cut again, though. The core EU countries as well as the CESEE-10 increased exports in consumer goods, which has traditionally been dominated by China. Several CESEE-10 countries also managed to explore a relatively large number of new export markets.

- We further explore different forms of competitive pressure between each EU member country and China based on detailed information from trade links in narrowly defined product markets using the so-called Dynamic Trade Link Analysis (see Silgoner et al., 2013). The results of this analysis are summarized in the following.
 - Toward the end of the observation period (i.e. 2009), China was serving roughly 70% of all markets also served by individual EU members. Smaller Western and Southern EU countries, such as Portugal, Finland, Sweden and Ireland, show more overlap in geographical and sectoral export markets with China than the large EU export nations Germany, France, Italy and Spain. Most CESEE-10 countries range at the lower end of this scale, i.e. showing a smaller overlap with China. While CESEE-10 countries often enter markets that have traditionally been served by China, we observe the opposite for large EU countries: here we find more cases of China entering traditional markets of large EU incumbents than of large EU exporters entering the traditional Chinese export domains.
 - There is only very limited evidence of direct crowding-out between China and individual EU members; still, we note a rising importance of this type of competition over time. Cut-throat competition in terms of the EU country leaving the market while China continues to operate it is more relevant for CESEE-10 countries than for larger EU members. Vice versa, we observe that Germany often continues to operate in markets where Chinese exporters are exiting.

Overall, our analysis suggests that competition from China is well manageable and that there is still ample room for differentiation in terms of destination markets and export products. EU

countries have been fairly successful in the past in ensuring both the ability to retain existent trade relationships and the flexibility to create new ones despite rising competition from China. Nevertheless, especially small and peripheral EU countries are exposed to increasingly strong competition from China. In an environment of slowing demand from the most advanced import markets, the possibilities of further expansion will become more limited while competitive pressure from China is likely to rise further. Countries that are specialized in specific niches of production or that are especially competitive in their most important market segments will be less subject to cut-throat competition from China.

I INTRODUCTION

From the European perspective, China's emergence as a major trade competitor is ambivalent. On the one hand, cheap Chinese imports have a positive effect on the purchasing power of European citizens' incomes. By lowering the inflation rate, they also contribute to a greater monetary policy margin. And as input factors to production, they help support the competitiveness of European manufacturing products.

On the other hand, China enters traditional European export destination markets and the core segments of European production. In this case, China is sometimes seen as a menacing competitor that threatens to crowd out European exporters. This type of reasoning naturally also applies to other emerging markets' exports. For example, applying the shift-share analysis, Voon and Yue (2003) analyze exports of China and the ASEAN-4 to the U.S.A. and show that altogether the latter were less competitive than China. Athukorala (2009) shows a more pronounced picture by analyzing the impact of China's world market penetration on the export performance of other East Asian countries and finds that on the one hand competition from China does not necessarily imply proportionate losses in market share for all developing countries. On the other hand, China's rise in exports of labor-intensive manufactured goods made other East Asian countries lose comparative advantages in related product categories.

The aim of this paper is to investigate how well European producers withstand competition in third markets from China and to analyze to what extent they manage to conquer new markets given competition from China or whether they are driven out of their traditional export markets by China. Using highly disaggregated trade data from the UN Comtrade database, we try to identify, at the most detailed product level, those countries that withstood intensified competition best over the past decade. Countries that are specialized in specific niches of production or that are especially competitive in their most important market segments will be less subject to crowding-out effects¹ by China and thus benefit more from China's emergence as an exporter. Overall, this analysis will help us identify the winners and losers of China's emergence on the global trade market.

To this end, we will investigate market shares, the extensive and intensive margin of trade growth as well as the Dynamic Trade Link Analysis developed by Silgoner et al. (2013) that traces the contestation of a specific market segment for each pair of reporting countries – a

¹ Please note that “crowding out” does not refer to causality in terms of country A crowding out country B or vice versa. Nevertheless, in this paper, we use the term for reasons of simplicity. The analysis of causality is subject to future research.

given EU country and China – over time by processing information from single trade links. In Silgoner et al. (2013), we focus on the effects of China’s emergence as a competitor on the CESEE region as an aggregate, while in this paper we display single country results for all EU countries separately. This allows for a more detailed assessment of cross-country differences and similarities. Moreover, our analysis draws on the global UN Comtrade database instead of Eurostat’s COMEXT and thus covers the world goods market.

Our analysis centers on the following issues:

- The degree of accordance or differentiation between individual EU members’ export patterns vis-à-vis China in terms of sectoral and geographical specialization
- The importance of the extensive margin of trade and thus the role of newly explored regional and sectoral market segments for each country
- Potential crowding-out of EU members by China (and vice versa) from their traditional regional and sectoral export markets
- Identification of product groups and destination markets in which individual EU members are able to withstand intensified competition arising from China

Overall, we come to the conclusion that there is almost no evidence for cut-throat competition from China for European countries. Especially the large European countries such as Germany, France, Italy and the United Kingdom maintain their strong position and even manage to crowd out China from individual goods markets. In contrast, small EU peripheral countries in Southern as well as in Central, Eastern and Southeastern Europe (CESEE-10)² are exposed to much stronger competition from China and often show a tendency to leave markets where China is active. At the same time, the Southern periphery and CESEE-10 show much higher entry rates into new markets, often they also enter new markets which are unexplored by China, thus avoiding a rise in direct competition.

These findings are in line with the previous literature. Cheptea et al. (2005) observe that the good positioning of EU member countries on the European market allowed EU members to maintain more or less their markets shares. They further reveal that CESEE and emerging Asian countries (including China) show the strongest gains in global market shares over the period 1995 to 2002. Buitelaar and Van Kerkhoof also confirm that the EU-15 countries have been able to maintain their market position fairly well over the period 1999 to 2008. Based on a

² CESEE-10 refers to Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

constant market share analysis they also identify that competition from China, non-EU Europe and CESEE has at the same time intensified for the EU-15.

At the outset, let us point out two important limitations of our analysis of competitive pressures. First, we only use data on trade of goods but do not cover services trade, even though the latter is gaining in importance, especially for advanced economies. This limits the universality of our results, as we investigate the performance of an emerging market economy (China) against a group of largely advanced economies (EU-27). However, for services trade there is no database of comparable richness and depth as the UN Comtrade currently available.

Second, we focus on the competitive pressures in third markets and therefore to a certain extent disregard the performance of the import competing sectors: China's emergence in a specific market segment may not directly lead to export losses of European competitors but may well hurt the production for the own domestic market. We thus potentially underestimate the negative effects of China's export market penetration for Europe.

The paper proceeds as follows: Section 2 describes the evolution of world market shares for the EU members and China over the past decade. Section 3 dissects trade growth for each of these exporters into the contribution from the extensive versus intensive margin. Finally, section 4 contains the Dynamic Trade Link Analysis, which reveals interesting details about different types of competitive pressure between each EU member country and China in the world market. Section 5 concludes.

2 THE DATASET

Our analysis is based on UN Comtrade data which offers global country coverage and at the same time a high level of disaggregation for goods trade. We extract bilateral trade data at the highest possible level of disaggregation, namely the 6-digit HS (Harmonized System, 1996) level. Thus, our sample includes 5,132 products which are traded bilaterally between each exporter and importer worldwide.³ In the description of the results, we confine our attention to exports from all 27 EU members and China.

Our observation period starts in 2000⁴ and extends up to 2010. As such, our dataset covers a range of interesting episodes for world trade flows, such as the entire period since China's accession to the WTO in 2001. Furthermore, we include the EU's eastward enlargement by ten new Member States in 2004 and are able to assess the competitiveness effects of this important institutional step on incumbent and new members as well as on third parties. Finally, we also include the global recession in 2009, which has resulted in the steepest and most profound global trade decline ever observed in international trade statistics.

We extract all data according to the initial 1996 HS classification to avoid any difficulties resulting from later reclassifications (2002 and 2007). Such reclassifications introduce breaks in the time series as some products are moved to other or new data categories. In an investigation of the developments of single trade links over time, such reclassifications may lead to spurious results as some trade links are classified as new products without any underlying changes in actual trade patterns. One drawback of the use of the UN Comtrade database is that – just as with any large-scale global data source – it may contain unreasonable observations and recording errors. Given the huge mass of data points, a thorough plausibility screening would clearly be beyond the scope of the paper. As we will explain in the empirical analysis below, we consider only those new trade links for our Dynamic Trade Link Analysis that survive the second year. This should eliminate a substantial part of mis-recordings.

For our calculations of trade margins, we use export data. Export data in UN Comtrade always contain re-exports and transit trade, which might lead to overestimating the competitiveness of exporters with a huge share of re-exports or transit trade. While it is possible to obtain data on

³ Due to time and space constraints, we downloaded product-level trade data for the 75 most important exporting and importing countries only and arrived at 360,000 observations for each year. Still, our dataset, which covers more than 95% of world imports in 2010, is quite representative of the world market. Although we focus on exporters, it is necessary for all relevant indicators of competitiveness used in our analysis to define a common market in terms of global demand for imports. The list of exporter and importer countries can be found in table A1 in the Annex (the list of exporters is not fully identical with the list of importers).

⁴ In fact, we apply data starting in 1999 as we need this additional year for calculations in the framework of the Dynamic Trade Link Analysis where a new trade link is only considered when it has survived for at least one year.

re-exports from the database, these data are often not reliable. For example, UN Comtrade does not report any re-exports for Latvia although they are an important component of Latvian exports. Thus, we prefer not to work with the rather sketchy data on re-exports. Implicitly, we thus assume that the fraction of re-exports is comparable across EU members and thus the results are not biased toward a particular country. We are confident that this introduces a smaller bias in the estimations than subtracting the incomplete data on re-exports from gross exports. For the dynamic trade link analysis, we base our calculations on import data – as by definition competition takes place at the destination market -, thus this data problem is avoided.

3 THE GLOBAL PICTURE: DEVELOPMENT OF MARKET SHARES

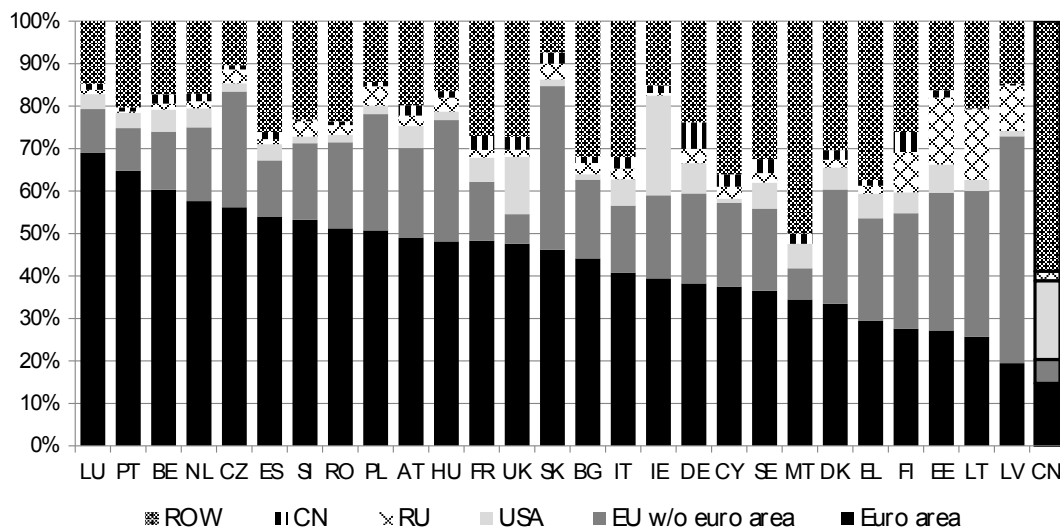
Over the last decade, China has become the important single exporter worldwide. Between 2000 and 2010, its export market share increased from about 4% to more than 12%. Large increases in market shares can also be observed in the other BRIC countries Brazil, Russia and India, as well as in the CESEE countries that joined the European Union in 2004 and 2007 while all other EU countries lost market shares, some of them on a considerable scale. In the same vein, the export market share of the United States was also reduced over the past decade.

Figure 1 illustrates the regional distribution of exports for each country. With the exception of the Baltics and Malta, the euro area (black bars) represents the most important destination for exports, absorbing up to 70% of all exports. For most European exporters, the EU-27 (black and dark gray) receive about two-thirds of all exports. Russia (checked) is of importance only for Finland and for the Baltics, while the U.S.A. (light gray) is a major export destination only for the U.K. and Ireland. To date, China (striped) plays only a minor role as an export target for EU members. Only Germany and Finland export about 5% to 6% of their total exports to China. Overall, Figure 1 suggests that EU countries do not yet benefit to a large extent from the huge Chinese market as an export destination even though exports to China have risen in absolute terms.

China on the other hand has a clear export focus on the “rest of the world” (ROW; shaded), which especially comprises other Asian economies. The U.S.A. also plays an important role. Its share in total Chinese exports is currently 17%, which is about the size of the share of exports going to the EU.⁵

⁵ This might underestimate the true importance of exports going to Europe or the U.S.A. as many Chinese exports are input factors to the production process abroad. We cannot capture the role of global value chains – or the importance of China as a source country in net trade flows – with our dataset.

Figure 1 Regional distribution of exports, as a share in total exports, 2011



Source: UN Comtrade.

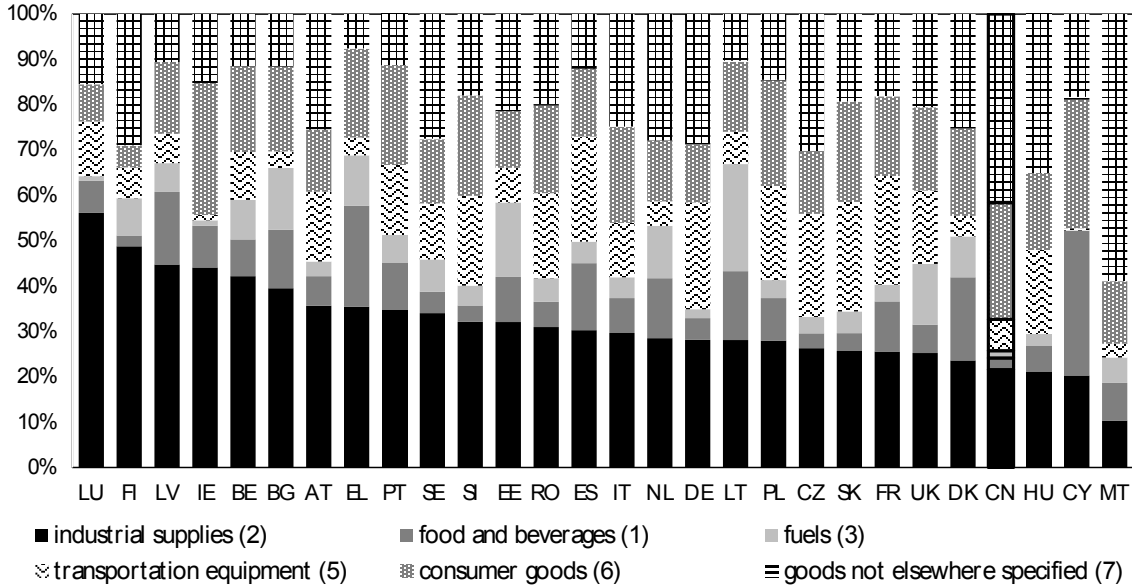
Figure 2 helps understand which industries are most heavily exposed to intensified competition from China. Or, as Silgoner et al. (2013) put it: which countries are fishing in the same pool of product categories as China. The chart shows the decomposition of exports according to the seven Broad Economic Categories (BEC) defined by the United Nations: food and beverages, industrial supplies not elsewhere specified, fuels and lubricants, capital goods, transport equipment, consumer goods not elsewhere specified and goods not elsewhere specified.⁶ This first analysis will also help identify those product categories that will be the focus of the deeper analysis in this paper.

The most important product group for most EU countries is **industrial supplies** (black bars). The share of this product category in total exports reflects to a large extent the relocation of large international enterprises and typically contains to a great extent re-exports of imported intermediate goods. The import content of exports cannot be judged from our database. We observe a marked increase in the share of industrial supplies in total exports over the past decade in several euro area peripheral countries as well as in the U.K. and U.S.A. This increase is traceable to the global economic integration process, which promotes division of labor and international production chains. By contrast, the share of industrial supplies lost importance in most of the CESEE-10 countries in our sample. This might point to a structural shift away from producing parts and components toward a greater focus on final assembly and is also reflected

⁶ The Annex includes a comparable Figure A1 for the year 2000 to illustrate changes in patterns over the last decade.

in the increased importance of capital and consumer goods exports mentioned below. For China this product group slightly lost relevance over time but continued to represent about one-fifth of total exports in 2010.

Figure 2 Share of product category in total exports, 2010



Source: UN Comtrade.

The most important product group for China in 2010 is **capital goods** (see the checked bars in figure 2). Its share in total Chinese exports expanded markedly over time, from only 25% in 2000 to 40% in 2011 (see Figure A1 in the Annex for the market share in the year 2000). Similarly, the importance of capital goods has increased markedly since 2000 in all the CESEE-10 countries in our sample. It is thus a challenge for the CESEE-10 region to withstand the fierce Chinese competition in this product category. Silgoner et al. (2013) conclude that the CESEE-10 region has so far managed to successfully compete with China in many important market segments such as plastics and machinery, at least in the EU-15 market. By contrast, Figure 3 shows that the export share of capital goods (at least slightly) declined for the most advanced EU countries. Capital goods used to be among the most important product groups in 2000 but fell back to second place after industrial supplies in most core EU countries. This may suggest some crowding-out effects following China’s emergence.

We further observe that there is a group of European countries with an export focus on **transportation equipment** (wavy bars). The cluster around German and French automobile production spreads to Austria, the Czech Republic, Hungary, Poland, Portugal, Slovenia and Slovakia. Car production is also important in the U.K., and Romania has its own car brand. Over time this product group lost importance for the most advanced EU countries but gained prominence within the export bundles of the CESEE-10 countries. For China the manufacture of transportation equipment is of rather small importance today, but its share in total Chinese exports has grown dynamically by about 52% since 2000. Overall, this is a product segment where both the CESEE-10 and China are expanding, probably to some extent at the expense of the core EU countries. It would be worthwhile to investigate the dynamics in this product group more thoroughly.

Consumer goods (shaded bars) still play an important role in the export portfolio of China, most CESEE-10 countries and some of the EU peripheral countries, although their export share had declined markedly over the last decade. In the most advanced EU countries, by contrast, consumer goods are less important, but an increasing trend is evident. While this product category is probably most prominently perceived as being dominated by China – given the prevalence of final consumer goods “made in China” –, it no longer appears to be very prone to crowding-out effects through China’s presence. Hence, this product group deserves special attention.

Fuels (light gray bars) are only relevant for a few countries, notably those with own resources (U.K. and Denmark) or those which host important transit routes (the Netherlands, Belgium, the Baltics, Greece). Similarly, **food and beverages** (dark gray bars) are of high relevance for a few EU countries which are characterized by favorable climate and land conditions, such as Greece, Cyprus, Spain, as well as for Denmark due to its advanced technology in the sector. Both product groups are of small and decreasing importance for China.

To sum up, the four most dynamic export segments appear to be industrial supplies, capital goods, transportation equipment and consumer goods. Especially capital goods and transportation equipment appear to be highly contested and are increasingly being provided by emerging markets. The share of these two product groups in total exports rose both markedly and rapidly not only for China, but also for the CESEE-10 countries. In other words, both regions seem to expand along similar directions, although at different speed., For the remainder of the EU countries, by contrast, both categories lost importance, which might indicate crowding-out effects. Then again, the most advanced countries recorded a rise in the share of

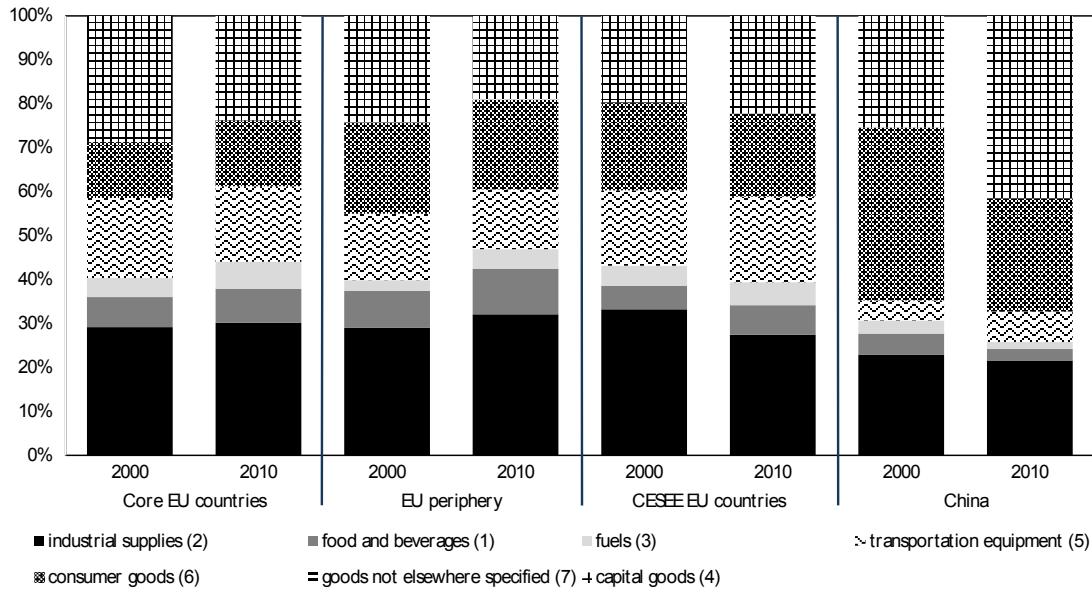
industrial supplies and consumer goods in total exports. In the remainder of the paper, we will thus focus on these four most important and dynamically evolving export segments.

The analysis also suggests natural country subgroups for further analysis, as illustrated in Figure 3. In the **“core” EU countries** (Austria, Belgium, Denmark, Finland, France, Germany, Luxembourg, the Netherlands, Sweden and the United Kingdom), the most important product categories are industrial supplies and capital goods in terms of market shares in 2010. Over the last decade, capital goods and transportation equipment lost importance, while industrial supplies and consumer goods gained relevance. The second group of countries, the **CESEE-10** region, covering Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia, generally gained market share over the last decade. The export sector is dominated by industrial supplies, consumer goods and in some countries transportation equipment⁷. Similarly to China – although less quickly – they managed to realize gains in capital goods and transportation equipment. A final group of countries – which we will call **EU periphery** (Cyprus, Greece, Ireland, Italy, Malta, Portugal, Spain) – shares with the CESEE-10 region the focus on industrial supplies and consumer goods⁸. However, they lost in both segments, just as the core EU countries. We will use these subgroups to structure the single-country results, with different colors indicating the subgroups: blue for the core EU countries, red for the EU periphery, green for the CESEE-10 countries and purple for China.

⁷ Hungary and the Czech Republic deviate from the pattern of the other CESEE-10 countries insofar as the most important product groups are capital goods, industrial supplies and transportation equipment, while consumer goods are of only minor importance. The dynamics over time for the most important BEC codes are, however, in line with developments in other CESEE-10 countries.

⁸ Only Spain and Portugal show a notable share of transportation equipment in their world exports given the integration into the German automobile industry.

Figure 3 Share of products category in total exports, 2000 and 2010



Source: UN COMTRADE

4 EXTENSIVE AND INTENSIVE MARGIN OF GROWTH

How successfully a region can stand up to international competition also depends on the flexibility of the economy with respect to moving into new, yet promising markets and maintaining presence there. Hence, to complete our picture, we also dissect total export growth into the contribution that arises from the intensive margin of growth versus the extensive margin. This will reveal whether export growth relies more on the deepening of existent trade links or rather on the opening-up toward new regional or sectoral export markets. The analysis of each country's extensive and intensive margins of trade growth will illuminate the crowding-out hypothesis from a different angle.

For our calculation of the intensive and extensive margin of trade, we follow an approach which is similar to Benkovskis (2012), but instead of dissecting market shares, we split export growth (in nominal U.S. dollars) into the growth in existent varieties (intensive margin) and the ratio of new to old varieties in two consecutive periods of time (extensive margin). Thus, as in Amiti and Freund (2010), we implicitly use Feenstra's (1994) variety index as the basis for our definition of the extensive margin:

$$EM_t = \frac{\sum_c \sum_{g \in G_t} X_{c,g,t} \sum_c \sum_{g \in G_{t,t-1}} X_{c,g,t-1}}{\sum_c \sum_{g \in G_{t,t-1}} X_{c,g,t} \sum_c \sum_{g \in G_{t-1}} X_{c,g,t-1}} \quad (1)$$

whereby $X_{c,g,t}$ is the country's nominal exports of good g to country c at time t . G_t is the set of exported products in time t , G_{t-1} the set of exported products in time $t-1$ and $G_{t,t-1}$ refers to the set of goods exported in both periods. Thus, if the value of varieties exported in period t (the first term in equation 1) exceeds the value of varieties exported in period $t-1$ (the second term), the extensive margin is greater than one. Variety refers to each product-destination combination, i.e. if an exporter starts serving a new geographical destination with a product he was already exporting to another destination, this is counted as a new variety. Likewise, serving an existent geographical destination with a new product (defined at the 6-digit HS level) is counted as a new variety. Countries either start exporting to a new geographical destination or extend the set of exported goods going to existent trading partners, or they do both at the same time. The

extensive margin is the part of export growth that results from the exploration of new export markets.⁹

The intensive margin is defined as the change in the value of existing varieties, i.e. varieties that are traded in both years, and thus captures the part of export growth which results from the intensification of already established trade relationships as countries export more of the same products to the same export markets. By defining the intensive margin simply as export growth in existent varieties in both periods,

$$IM_t = \frac{\sum_c \sum_{g \in G_{t,t-1}} X_{c,g,t}}{\sum_c \sum_{g \in G_{t,t-1}} X_{c,g,t-1}} \quad (2)$$

we can easily see that the two margins together account for total trade growth $\frac{\sum_c \sum_{g \in G_t} X_{c,g,t}}{\sum_c \sum_{g \in G_{t-1}} X_{c,g,t-1}}$.

We calculate these indices (intensive and extensive margin of trade) for the growth in exports in each year. Hence, a new variety is only factored into the extensive margin in the year when it is first exported. In subsequent years, it will be counted toward the intensive margin. This has to be kept in mind when interpreting the results. When depicting our results graphically, we transform both indices into growth rates.

Figure 4 shows for each country the average contribution of the extensive margin to total trade growth over the last decade.¹⁰ The different country groups explained in section 3 are indicated in different shades of gray (black for the CESEE-10, dark gray for the EU periphery, light gray for the core EU countries and white for China). In line with the comparable literature, the extensive margin is, as a rule, rather small at about, or even less than, 1% of total trade growth. It is generally larger for most CESEE-10 countries, especially for Latvia, Lithuania, Bulgaria, Romania and Slovenia than for the core EU countries (except for Luxembourg) and the EU periphery (except for Greece¹¹). Hence, trade growth is mainly driven by the intensification of

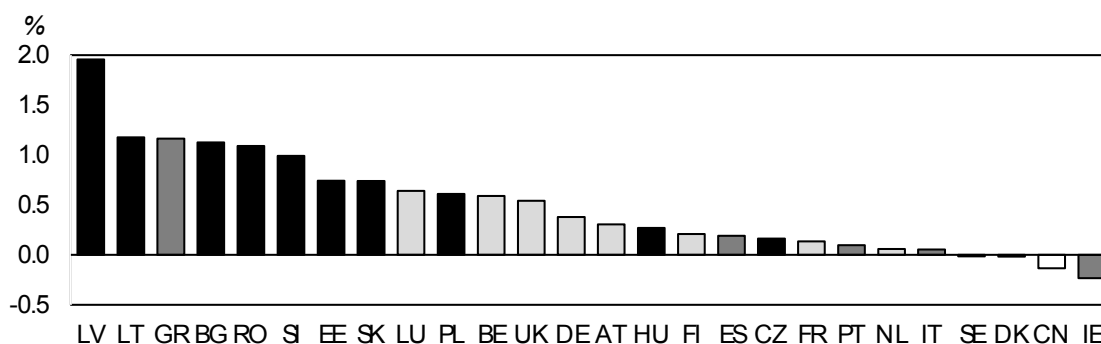
⁹ This approach is not standard in the empirical literature. Amiti and Freund (2008) focus on the product dimension so that only the first export of a specific good to any destination counts for the extensive margin but not the geographical widening of export markets. Opposite examples are Evenett and Venables(2002) or Felbermayr and Kohler (2006), who focus on the regional dimension of export markets. Besedeš and Prusa (2011) use both the product and the geographical dimension.

¹⁰ Cyprus and Malta are not included in this section for data reasons.

¹¹ Greece appears to be a special case given its very low degree of openness and the very moderate merchandise export growth over the decade following monetary integration. In such circumstances, any new trade link can disproportionately influence trade growth.

already existent trade relationships. The small size relates to our year-by-year investigation – compared with studies that have longer time horizons (Amiti and Freund, 2008; Evenett and Venables, 2002; Felbermayr and Kohler, 2006) – and to the focus on industrial countries that have typically exploited potential export markets to a greater extent. The fact that we investigate trade values and not just the number of trade links (as for example Besedeš and Prusa, 2011) also reduces the size of the extensive margin as new trade relationships tend to be of a small magnitude.

Figure 4 Average contribution of the extensive margin to total export growth



Source: UN COMTRADE, authors' calculations

Average from 2000 - 2010.

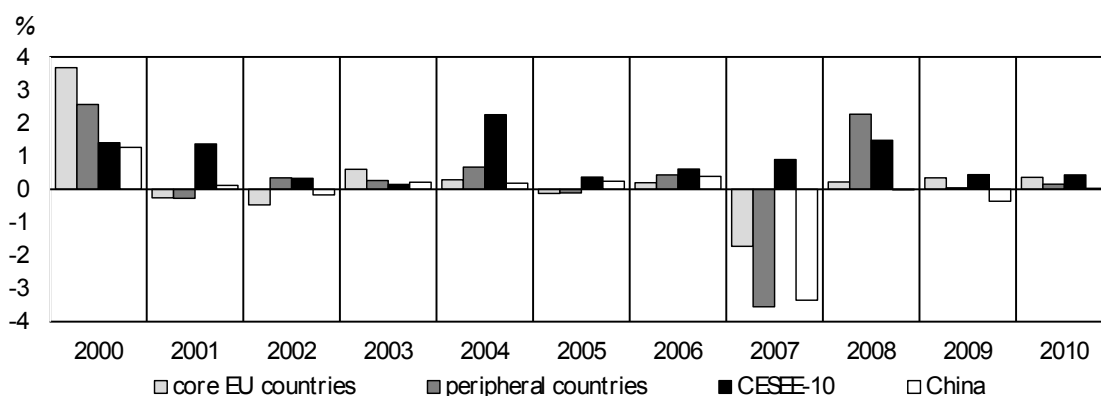
The small – or actually negative – size of the extensive margin is also observable for China. This is somewhat surprising against the conventional claim that China is progressively flooding the European market with new products. Typically, a catching-up process is initially based on a diversification of production before the focus is put on specialization strategies once a certain level of development has been reached. Our result is, however, in line with Amiti and Freund (2008) and Silgoner et al. (2013) and seems to be related to the fact that the Chinese export diversification phase was already accomplished more than a decade ago (Cheptea et al., 2010) and is thus not captured by our sample.

Another possible explanation relates to differences in the level of disaggregation within main product groups. For historical reasons, HS codes for product groups, such as agricultural products, processed food and textiles and clothing, are more narrowly defined than individual tariff lines for machinery and equipment. As an illustration, the HS 1996 classification lists 822 differentiated textile product categories (falling into the end use category of industrial supplies and consumer goods), while the “machinery and electrical equipment” heading includes 804

different product lines. In the previous section, we noted that China's export patterns changed notably during our observation period. While industrial supplies and consumer goods (including food, textile and clothing items) lost importance, the share of capital goods (covering machinery and equipment) in total exports increased. Thus, China's structural shift away from its traditional export goods may also induce an artificial reduction in its extensive margin simply as a result of the properties of the HS classification system as narrowly defined product categories cease to exist.

Finally, we cannot rule out another, purely statistical, factor which possibly lowers China's average extensive margin over the period: Although we have extracted all trade data according to the HS 1996 classification, the reclassifications that occurred in 2002 and 2007 may still blur our results for these years. This last hypothesis may be investigated through an inspection of annual patterns of the extensive and intensive margin. Figure 5 reveals that the contribution of the extensive margin to export growth is negligible in most years. There are just a few instances when the extensive margin is significantly positive or negative. In 2000, the extensive margin was the main contributor to export growth in the core EU countries. This may be related to the introduction of the euro as a common currency in 1999, which can be assumed to have had trade-creating effects (see Baldwin et al., 2005; Rose and Stanley, 2005; Flam and Nordström, 2006; to cite just a few papers). Evidence for the peripheral EU countries is less pronounced and more mixed. The CESEE-10 and China report a significantly less pronounced contribution of the extensive margin in 2000. However, the somewhat higher contribution of the extensive margin to total export growth for the CESEE-10 in 2001 might indicate spillover effects of the introduction of the euro to CESEE-10 exporters as the EU-15 countries are their main trading partners. Thus, the common currency facilitated the establishment of new trade relationships with the EU-15, not just for the euro area countries themselves, but also for other countries.

Figure 5 Annual average contribution of the extensive margin to total export growth



Source: UN COMTRADE, authors' calculations. Unweighted average for the respective group of countries.

The 2004 accession to the EU went hand in hand with an important trade push for the respective CESEE countries: in the form of both more trade along traditional trade links and new trade relationships. The importance of the extensive margin may, however, also be partly related to the new reporting requirements after EU accession: before 2004, all trade data were derived from customs statistics, while EU accession implied a switch in reporting to intra- versus extra-EU trade. Intra-EU trade flows are based on survey data; thus, it cannot be excluded that this leads to spurious new-trade-link cases.

In 2007, Bulgaria and, to a lesser extent, Romania also benefited from their EU accession, showing positive extensive margins in 2007 and 2008. These figures also drive the positive average contribution of the extensive margin to total export growth for the CESEE-10 shown in Figure 5 and appears to confirm trade-creating effects of EU enlargement. In contrast, almost all other countries lost many trade links and thus show a negative contribution of the extensive margin to total export growth in 2007¹² (except for Estonia, Latvia and Slovakia). This may indicate an early herald of the crisis as companies became less venturesome after the turn of the business cycle. The drop in the extensive margin was most pronounced for capital goods as investment was the first GDP component to suffer. In most countries, existent trade relationships were, however, intensified markedly in that year, so that trade growth was still very high.¹³

¹² This might be related to the HS reclassification in that year despite the fact that we use the HS 1996 classification.

¹³ The large negative extensive margin in 2007 also explains why the average contribution of the extensive margin to trade growth over the whole period is negative in China and Ireland (Figure/chart 5). Nevertheless, in both countries the average extensive margin remains small (around 0.2) over the entire period when the year 2007 is excluded.

In 2008, when trade started to contract sharply, we observe a positive contribution of the extensive margin to negative export growth for all European regions, which indicates that lost trade relationships dominated over newly formed trade relationships. In 2009, by contrast, the overall contribution of the extensive margin remained relatively small, which implies that exporters rather adjusted trade flows in existent trade relationships and no further trade links were permanently lost. In fact, the extensive margin contributed positively to export growth in most EU countries in that year, thus preventing a more severe drop in total trade. New trade links were created in particular by Germany, Luxembourg, Slovakia, Latvia and Lithuania. In contrast, several countries recorded a shrinking extensive margin, such as China, France, Finland, Greece, Slovenia and Bulgaria. The subsequent recovery of trade in 2010 took place along existent trade relationships so that the contribution of the extensive margin to export growth was negligible in most countries.

The annex shows the average contribution of the extensive margin to export growth according to selected end-use (BEC) categories (Figures A2 to A5). Industrial supplies and capital goods are the most important product categories for the majority of EU countries. For industrial supplies, the deepening of existent trade was the major source of export growth, as indicated by the especially small contribution of the extensive margin. On balance, the CESEE-10 countries were more successful in establishing new trade links in industrial supplies. The same is also true for capital goods trade. For several (mostly core) countries, negative contributions of the extensive margin in both product categories can be attributed to large losses in trade relationships in 2002 – possibly due to consolidation following the large diversification in the previous year – and in the crisis year 2009.

Transportation equipment exports are particularly important for the CESEE-10 countries in terms of export shares. Strong export growth in this product category was, however, mainly driven by a rise in the value of exports to already established trade partners, as indicated by the very low extensive margin. The industry thus showed signs of consolidation. In the same vein, China, too, had already established many trade relationships in this sector before 2000 and thereafter continued to stabilize the existent trade links.

Consumer goods are a traditional Chinese export segment. However, it seems that some CESEE countries (the Baltics, Slovenia, Poland, Bulgaria and Romania) have increasingly been entering this market segment, as indicated by the positive contribution of the extensive margin to the export growth of consumer goods. While the EU periphery (especially Greece and Portugal) managed to build more new trade relationships compared with the trade links that were lost, the core EU countries on average recorded a negative contribution of the extensive margin, which

indicates a loss in export varieties. China built on its established trade relationships. The average negative extensive margin can be explained by a loss of trade relationships in 2007 before the economic and financial crisis hit.

Overall, the intensification of trade with existent partners was the main driver of export growth from 2000 to 2010, as indicated by the small contribution of the extensive margin to total export growth. Nevertheless, the establishment of new trade relationships is/was somewhat more important for export growth for the CESEE-10 countries than for the core EU countries, the euro periphery or China. The introduction of the common currency appears to have supported the establishment of new trade relationships. Export declines during 2009 were the result of smaller trade volumes rather than of permanent losses in trade relationships. This is a positive signal for future export growth as it is easier to revive long-lasting trade relationships.

5 DYNAMIC TRADE LINK ANALYSIS

Since competition does not only manifest itself in market shares, some questions remain open: Do exporters survive in direct competition in third-party markets or are they crowded out by exporters from different countries? As China is sometimes seen as a menacing competitor threatening to crowd out European exporters, the *Dynamic Trade Link Analysis*, developed by Silgoner et al. (2013), sheds light on this issue by analyzing the development of trade links in third-party markets over time.

With this newly developed tool we can map competitive pressure between any two exporters at very narrowly defined product markets. In contrast to traditional market share analysis, we are working on the disaggregate HS-6 digit level. This allows us to identify the fraction of product-destination markets in which the proliferation of exporters from China has coincided with an exit of exporters from EU members. However, we can also identify any other type of competitive pressure (as summarized below). In contrast to RCA indicators or changes in market shares, our method follows in spirit the analysis of intensive and extensive margins of trade. Thus, we also capture changes in the extensive margin, which are usually not explicitly identified in traditional measures of revealed competitiveness. The novelty of our method – which is conceptually simple, but computationally demanding – lies in a bilateral comparison of any two exporting countries. The results can thus supplement traditional indicators of market shares or RCA.

A trade link refers to the information whether a country exports a specific product at the 6-digit HS level to a given importing country or not, i.e. serves a particular “market.” Analyzing the 1/0 pattern of trade links at two points in time, we get information on four different states of trade links for a given country A and a given market B:

Table I **Definition of Trade Links**

Trade link	Explanation
Active	Country A is an active exporter to market B in both periods
Inactive	Country A does not serve market B in either period
Entry	Country A does not serve market B in the first period but starts exporting to B in the second period
Exit	Country A exports to market B in the first period and stops serving market B in the second period

Source: Authors' compilation.

We only account for new trade links that survive at least for two years because many new trade relationships fail within the first years¹⁴. Combining the information on the status of all trade links for exporter pairs — we always contrast one specific EU member country with China — allows us to identify different forms of competitive pressure. All in all, there are $[4^2 =]$ 16 different types of competitive pressure in each bilateral comparison of two individual exporters. Table 2 presents the most important types of competitive pressure analyzed in this section. The status of the EU country is always indicated in capital letters, the status of China in lower-case letters.

Table 2 Definition of Types of Competitive Pressure among Exporter Pairs

Types of competitive pressure	Explanation	Combination of trade links for exporter pairs
No competition	EU member exports to a market which is not served by China	ACTIVE-inactive
Existent competition	Both countries export to the same market	ACTIVE-active
Conquering new markets	EU member starts exporting to a new destination market not served by China	ENTRY-inactive
New competition	At least one country enters a destination market where the other country is already active, or both countries enter a new market	ACTIVE-entry ENTRY-active ENTRY-entry
Crowding-out	One country leaves a market where the other country is active or has just become active	EXIT-active EXIT-entry ACTIVE-exit ENTRY-exit
Leaving markets	EU member stops exporting to a market where China is not active, or both exporters leave the market simultaneously	EXIT-inactive EXIT-exit

Source: Authors' compilation.

It should be emphasized that the *Dynamic Trade Link Analysis* exclusively uses information about the number of trade links, but not about the value of trade flows. We can thus not investigate partial crowding-out effects in the sense of one competitor expanding trade flows at the expense of the other in a specific export market. We can only observe exporters leaving a market altogether. The purpose of this exercise is to investigate patterns of trade diversification

¹⁴ Besedeš and Prusa (2011) provide evidence for developing and emerging economies, which shows that about 70% of new trade relationships fail within two years.

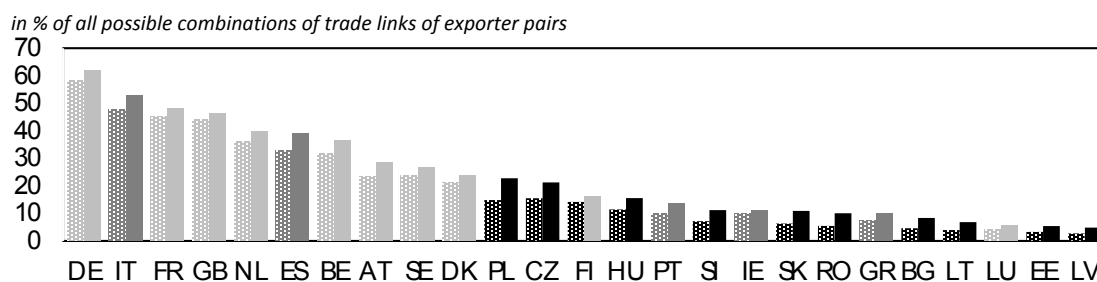
as well as to observe the development of new trade links which are the source of future export growth.

While the analysis is done at the 6-digit HS level, the results are presented for total trade. The fact that we analyze the number of trade links rather than trade values also implies, however, that all trade links are given equal weight when we construct the total aggregates, irrespective of their share in exports.

It is important to conduct the analysis at the most detailed level of disaggregation. Working with aggregated data would imply that many entries and exits are missed. Thus, we can only meaningfully speak of crowding-out when we define the market as narrowly as possible. In our case, we use product markets in bilateral trade. We should once again stress that our definition of crowding-out does not imply any causality (see footnote 2), but merely captures simultaneous moves by competing exporters that serve the same destination with the same product.

In table 2, we deliberately dropped those combinations of trade links where the EU member does not have an exporter status, i.e. we ignore all combinations where the EU member is inactive. In 2009, for example, almost 80% of all markets were consequently excluded. This helps control for the country size in our exercise, as the number of existent common trade links with China (where the European country has the exporter status ACTIVE/ENTRY or EXIT) typically increases with the size of a country, as suggested by Figure 6. For instance, while Germany has an exporter status in 62% of all possible markets (including the markets where German exporters are inactive), Latvia only serves 5% of all 374,636 product-destination combinations. Comparing these figures with the importance of the extensive margin for export growth shown in Figure 4 reveals the following: Export growth in the countries with the smallest market coverage in percent of all possible markets was to a greater extent driven by a rise in export varieties. All EU exporters increased the number of destination markets over time, most strongly so the CESEE-10 countries.

Figure 6 Markets served by European exporters



Source: UN COMTRADE, authors' calculations.

Shaded bars = 2001; solid bars = 2009.

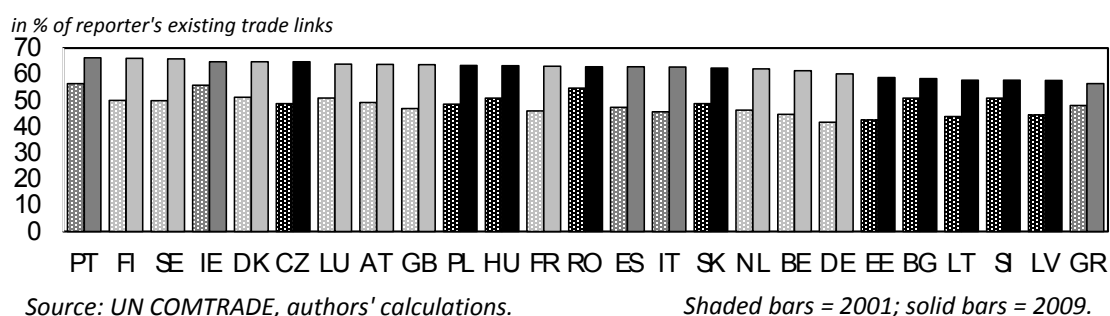
For the same reason – to control for the country size – Figures 7 to 11 present for each EU member-China pair different types of competitive pressure as a fraction of all trade links where the EU member has an exporter status. Additional figures are shown in the annex. The different shades of gray again refer to the three country groupings which were established in section 3 based on the product mix of exports: core EU countries are shown in light gray, peripheral EU countries are marked by dark gray and CESEE-10 countries are shown in black.

The solid bars in Figures 7 to 11 refer to the change in the exporter status from 2008 to 2009, while the shaded bars refer to 2001 as compared to 2000. The choice of these two periods is given by data availability: As we require new trade links to survive for at least two years, we lose observations on both ends of our sample. The comparison of the two years 2001 and 2009 for all possible types of competitive pressure listed in table 2 reveals that competitive pressures changed markedly in the course of those 8 years. To illustrate differences across country subgroups, reporting countries are always sorted in descending order based on the share of “existent competition” in total trade links in 2009 (Figure 7).

The extent of existent competition between individual EU members and China (observed at the margin of the markets served by EU members) is fairly homogeneous across all EU countries. Figure 7 shows that the fraction of trade links where both China and the given EU member are active in two consecutive periods amounts to roughly 62% in 2009, up from 49% in 2001. Thus, mutual competition increased for all EU members. Interestingly, the greatest overlap in export markets with China is observed for the smaller western and southern EU countries and not for the largest exporters (Germany, Italy, France, the U.K. or the Netherlands). With an overlap of 65% and beyond in 2009, countries like Portugal, Sweden, Ireland, Denmark and the Czech Republic face the strongest existent competitive pressure from China in terms of the fraction of markets where they are directly exposed to China. The group of large exporters shows an

overlap of existent markets between 60% and 64%, while many small Eastern European countries and Greece only serve between 56% and 59% of their export markets jointly with China.

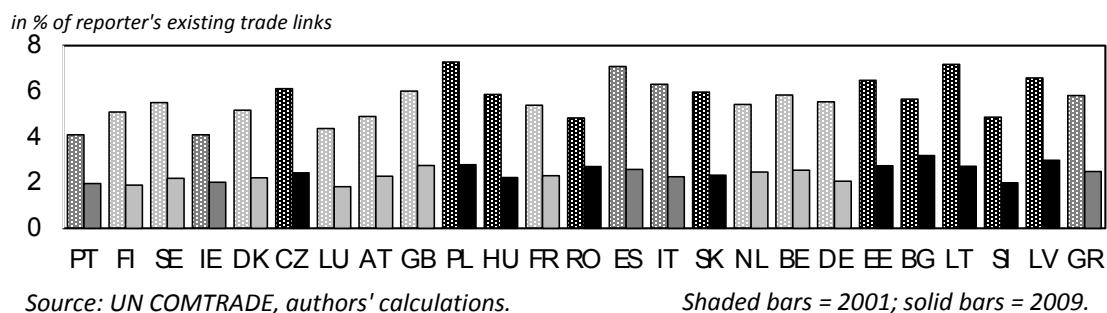
Figure 7 **Existent competition (ACTIVE-active)**



In line with this evidence, the large EU exporters show the highest fraction of “no competition” links, i.e. the fraction of markets which are served only by the given EU country and not by China (see Figure A6 in the annex). This suggests that large exporters manage better than smaller countries to differentiate themselves from China in terms of export products and destination countries and thus to strengthen their competitive position globally. In general, however, the fraction of such links decreased for all EU exporters over time.

In the same vein, the fraction of “newly conquered markets”, i.e. newly established trade links by either an EU member or China where the other exporter did not already operate (figure 8), declined from 5.6% in 2001 to 2.4% by 2009 on average across all EU members. Thus, with heightened existent competition, the number of new market conquests where China was not active decreased in all countries over time. The decline was particularly pronounced for large exporter such as Italy, Spain, Germany and Finland. But a number of CESEE-10 countries likewise shows a relatively strong decline, such as Lithuania, Hungary, Poland and Slovakia.

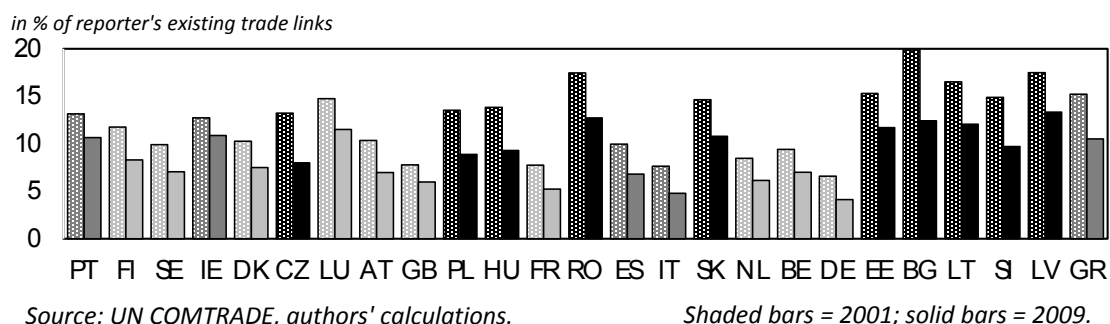
Figure 8 Conquering new markets (ENTRY-inactive)



However, exporters were apparently quite successful in operating existent markets: The number of cases where a country leaves a market, i.e. a market not being served by China either, is very small in general (less than 5% of all trade links) and declined for most countries between 2001 and 2009 (Figure A7 in the annex). In other words, unless exporters exit from a new market within the first two years after the venture – which we do not count as an “entry” given evidence of high initial failure rates from the literature –, they tend to survive well in the new market.

An interesting distinction in the analysis of entries into new markets can be made between cases where a new exporter enters a market currently being served by a competitor (“new competition,” Figure 9) as opposed to entering a market which is not served by the respective competitor (“conquering new markets,” Figure 8). Entry rates into new markets which are already served or are at the same time entered by China are particularly high for CESEE-10 countries and the smaller peripheral EU countries. New competition cases decreased over time for all countries.

Figure 9 New competition (ACTIVE-entry, ENTRY-active, ENTRY-entry)

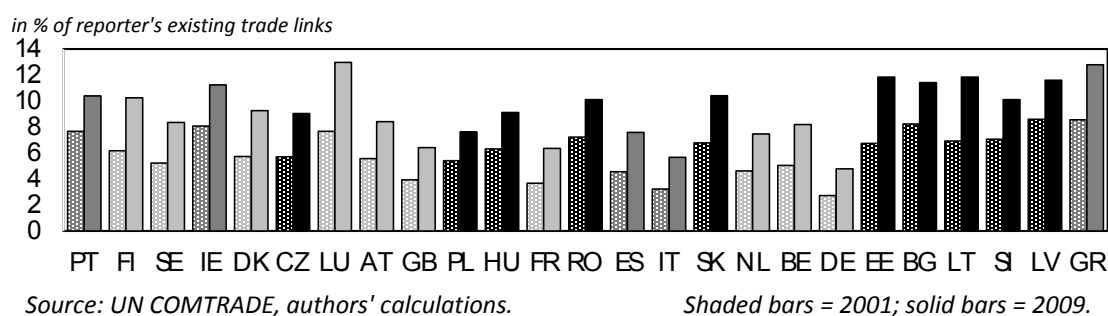


Comparing the cases where the respective EU member enters a market currently being served by China to those where China enters a market which is served by an EU member, we observe that especially CESEE-10 countries and peripheral EU countries frequently move into markets served by China. Thus, increased competition on these markets is often the result of entry by a small, peripheral EU country and not due to China's rising dominance. In contrast, the opposite holds for the large EU exporters, i.e. Germany, France, Italy and the U.K., where China predominantly enters into their traditional markets, thus raising the level of competition for these large EU exporters.

Finally, the last but nevertheless the most interesting type of competitive pressure is depicted in figure 10. The four combinations which are summarized here all represent different forms of potential crowding-out of one exporter by its competitor. We should emphasize here that we can only observe that a specific market is no longer served by country A while country B is still or newly exporting to this market. We can, however, not say anything about causality. Crowding-out of country B by country A is only one possible scenario. For the sake of simplicity, we stick to the term "crowding-out," while keeping in mind that a proof of causality is missing at this stage and would be the topic of future research.

As a first interesting observation, even taken together, these cases are less important than the creation of new competition. However, we observe an increasing trend over time. Furthermore, with 10% or more of all cases, in particular CESEE-10 countries and the small peripheral EU members are especially affected by this type of competition.

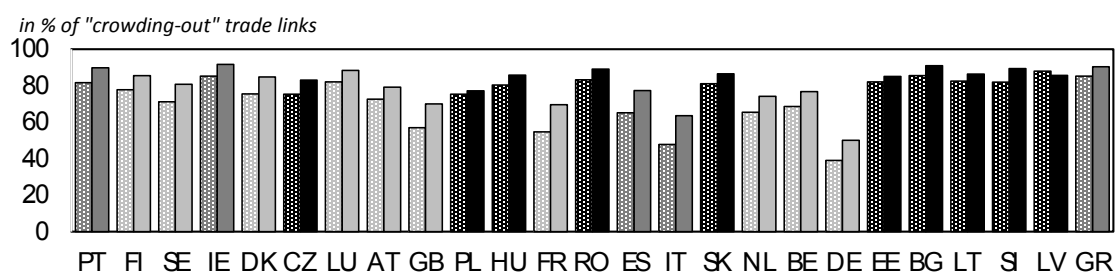
Figure 10 Crowding-out (ACTIVE-exit, ENTRY-exit, EXIT-active, EXIT-entry)



As crowding-out of European exporters by Chinese newcomers is one of the most pressing concerns, we disintegrate the bars in Figure 10 and extract information on the crowding-out of EU countries by China. Figure 11 shows the share of crowding-out cases in which an EU

country exits a market which China has just entered or continues to operate. Toward the end of our sample, in 16 out of the 25 EU countries observed, more than 80% of all crowding-out cases refer to an incidence where China crowds out the EU country. The countries for which crowding-out was less frequently observed (Figure 10) tend to crowd out China to a larger extent. The extreme case is Germany where crowding-out is observed for only 4.8% of all trade links in 2009 (Figure 10) and Germany crowds out China in half of these cases (Figure 11). In contrast, evidence for the CESEE-10 is mainly characterized by China crowding out the CESEE-10 countries (Figure 11), and, furthermore, the incidence of crowding-out increased markedly over time (Figure 10). The same holds true for the EU's small peripheral countries Ireland, Portugal and Greece. In all three countries, 90% of all crowding-out cases refer to their exit from a market where China enters or is active (Figure 11). Compared with 2001, crowding-out *by* China has generally gained importance over crowding-out *of* China, particularly for the core EU members.

Figure 11 Crowding-out by China (EXIT-active, EXIT-entry)



Source: UN COMTRADE, authors' calculations.

Shaded bars = 2001; solid bars = 2009.

6 CONCLUSIONS

China is often seen as a menacing trade competitor in merchandise markets. In this paper, we take the European perspective and investigate the distinct patterns of regional and sectoral trade specialization of EU Member States on the world market and compare these patterns with those of China in the period from 2000 to 2010. We aim at identifying the importance of newly developed regional and sectoral market segments and at finding evidence for potential crowding-out of EU Member States by China and vice versa. We analyze market shares, the extensive and intensive margin of trade growth and conduct the Dynamic Trade Link Analysis developed by Silgoner et al. (2013) for export data at the 6-digit HS product level.

For China, the euro area has gained importance as an export destination over the past decade, having evolved into an equally important destination for Chinese goods as the U.S.A. In general, we find that export growth is mainly driven by the intensification of existing trade relationships rather than by the formation of new trade links (extensive margin). Nevertheless, the extensive margin turns out to be more important for the CESEE-10 than for the EU periphery, the core EU countries or even China. It seems that China had already developed many new trade links at the beginning of the 2000s (Cheptea et al., 2010). In Europe, the introduction of the common currency as well as the two EU enlargement rounds in 2004 and 2007 appear to have contributed to genuine trade creation. Trade losses in the course of the economic and financial crisis in all countries were mainly caused by a reduction in trade volumes rather than the permanent termination of trade links.

At the sectoral level, the share of capital goods and transportation equipment in total exports strongly increased in the CESEE-10 and in China from 2000 to 2010, which indicates growing direct competition within these categories. In the core EU countries, capital goods and transportation equipment lost importance in terms of export market shares, which might point to potential crowding-out effects. Export growth of consumer goods – a product segment traditionally dominated by China – was primarily the result of intensified trade relationships in the case of the core EU countries and the EU periphery, while for the CESEE-10 the extensive margin was relatively large, which suggests future export growth potential.

In a further step, we undertake the “Dynamic Trade Link Analysis” (see Silgoner et al., 2013), a bilateral comparison of different types of competition between each EU member country and China. More specifically, we compare the export status of each EU member country (vis-à-vis all importers) to the export status of China at the detailed product level, controlling for the country size. Our results show that toward the end of our observation period, China served

roughly 70% of all markets which were served by individual EU members. Small and peripheral countries are more exposed to competition from China than the large EU export nations. Most CESEE-10 countries are at the lower end of this scale. However, CESEE-10 countries often enter into new competition with China by tapping into markets that have traditionally been served by China. In contrast, new competition among large EU exporters and China is predominantly the result of China entering a traditional market of the EU incumbent. Finally, we observe only very limited evidence of cut-throat competition through China. However, the crowding-out potential is considerably higher for the CESEE-10 and the small peripheral EU countries than for larger EU members; in some cases, the latter even crowd out China from their traditional export markets.

To sum up, our analysis suggests that competition from China is well manageable and that ample room remains for differentiation in terms of destination markets and export products. Athukorala (2009) provides an argument how increasing competition from China can be reconciled with almost constant global competitiveness of European exporters. With the rising emergence of global value chains, new opportunities arise for individual exporters to specialise in different stages of such production networks. Nevertheless, especially small and peripheral EU countries are exposed to increasingly strong competition from China. Given their smaller export base, they find it harder to withstand this competition than large EU exporters. A country's success in exporting will largely depend on its ability to strengthen long-lasting existent trade relationships as well as its flexibility to explore niches in terms of exporting new products and exploring new geographical markets. Our results show that EU countries have been fairly successful in the past decade to ensure both the ability to retain existing trade relationships and the flexibility to create new ones despite rising competition from China. However, especially in an environment of slowing demand from the most advanced import markets, the possibilities of further expansion will become more limited while competitive pressure from China is likely to rise further. Thus, policy makers have to remain vigilant and must not rest on past successes. A careful and recurrent inspection of export trends at the detailed level as well as an accompanying analysis of the underlying determinants should remain on the agenda. This calls for a thorough understanding of the underlying structural reasons for export success, which certainly extend beyond an exporter's size and location within Europe.

REFERENCES

- Amiti, M. and C. Freund (2010), An Anatomy of China's Export Growth, In: Feenstra, R. C. and Wei, S. J. (eds.): *China's Growing Role in World Trade*. The University of Chicago Press, 35–56.
- Athukorala, P (2009), The Rise of China and East Asian Export Performance: Is the Crowding-Out Fear Warranted?, *The World Economy* 2009.
- Baldwin, R., Skudelny, F. and D. Taglioni (2005), Trade effects of the euro - evidence from sectoral data, Working Paper No. 446, European Central Bank.
- Benkovskis, K. (2012), Competitiveness of Latvia's exporters, Latvijas Banka Working Paper No. 3-2012.
- Benkovskis, K. and R. Rimgailaite (2010), The Quality and Variety of Exports from New EU Member States: Evidence from very Disaggregated Data, Latvijas Banka Working Paper, 2-2010.
- Besedeš, T. and T. J. Prusa (2011), The Role of Extensive and Intensive Margins and Export Growth, *Journal of Development Economics*, 96 (2), 371-379.
- Cheptea, A., Gaulier, G. and S. Zignago (2005), World Trade Competitiveness: A Disaggregated View by Shift-Share Analysis, CEPII Working Paper, 23, 2005.
- Cheptea, A., Fontagné, L. and S. Zignago (2010), European Export Performance, CEPII Working Paper, 12, 2010.
- Evenett, S. J. and A. J. Venables (2002), Export Growth in Developing Countries: Market Entry and Bilateral Trade Flows. Mimeo.
- Feenstra, R.C. (1994), New Product Varieties and the Measurement of International Prices, *American Economic Review* 84(1), 157–177.
- Felbermayr, G. J. and W. Kohler (2006), Exploring the Intensive and Extensive Margins of World Trade. In: *Review of World Economics* 142(4). 642–674.
- Flam, H. and H. Nordström (2006), Trade Volume Effects of the Euro: Aggregate and Sector Estimates. Seminar Papers from Stockholm University No 746, Institute for International Economic Studies, University Stockholm.
- Rose, A. K. and Stanley, T. D. (2005), A Meta-Analysis of the Effect of Common Currencies on International Trade. In: *Journal of Economic Surveys* 19. 347–365.
- Silgoner, M., K. Steiner, J. Wörz and C. Schitter (2013), Fishing in the same pool: Export strengths and competitiveness of China and CESEE at the EU-15 market, ECB Working Paper, No. 1559, June.
- Voon, J.P. and R. Yue (2003), China-ASEAN Export Rivalry in the US Market: The Importance of the HK-China Production Synergy and the Asian Financial Crisis. *Journal of the Asia Pacific Economy* 8(2), 157-179.

ANNEX I

Table AI List of Countries Included in the Sample

Importers (reporters)	Share of world imports %	Exporters (partners)	Share of world imports %
United States	13.51	China	12.71
China	9.59	United States	8.18
Germany	7.33	Germany	8.03
Japan	4.76	Japan	5.15
France	4.12	France	3.56
United Kingdom	3.86	Korea	2.98
Italy	3.35	Netherlands	2.88
Hong Kong	3.03	Italy	2.87
Netherlands	3.02	Russia	2.69
Korea	2.92	Canada	2.64
Canada	2.69	United Kingdom	2.63
Belgium	2.68	Mexico	2.15
India	2.40	Belgium	2.07
Spain	2.17	Malaysia	1.70
Singapore	2.14	Switzerland	1.62
Mexico	2.07	Spain	1.61
Russia	1.71	Saudi Arabia	1.57
Australia	1.30	India	1.47
Turkey	1.27	Brazil	1.41
Thailand	1.25	Singapore	1.41
Brazil	1.24	Australia	1.39
Switzerland	1.21	Thailand	1.34
Poland	1.20	Indonesia	1.16
Malaysia	1.13	Ireland	1.06
Austria	1.03	United Arab Emirates	1.06
Sweden	1.02	Sweden	1.02
Indonesia	0.93	Poland	0.98
Czech Republic	0.86	Austria	0.96
Saudi Arabia	0.73	Norway	0.92
Hungary	0.60	Czech Republic	0.82
Denmark	0.58	Turkey	0.70
South Africa	0.55	South Africa	0.64
Norway	0.53	Denmark	0.60
Portugal	0.52	Hungary	0.60
Finland	0.47	Nigeria	0.55
Slovakia	0.44	Vietnam	0.51
Greece	0.44	Finland	0.49
Romania	0.43	Philippines	0.48
Ukraine	0.42	Chile	0.47
Ireland	0.42	Hong Kong	0.46
Israel	0.41	Argentina	0.45

Philippines	0.40	Qatar	0.45
Argentina	0.39	Venezuela	0.42
Chile	0.39	Kuwait	0.42
Nigeria	0.30	Algeria	0.40
Algeria	0.28	Slovakia	0.40
Colombia	0.28	Israel	0.38
Pakistan	0.26	Ukraine	0.37
Morocco	0.24	Kazakhstan	0.33
Belarus	0.24	Romania	0.32
Venezuela	0.22	Portugal	0.30
New Zealand	0.21	Colombia	0.28
Peru	0.21	Peru	0.22
Slovenia	0.18	Oman	0.21
Bulgaria	0.17	New Zealand	0.20
Lithuania	0.16	Costa Rica	0.18
Tunisia	0.15	Egypt	0.17
Ecuador	0.14	Slovenia	0.16
Luxembourg	0.14	Greece	0.15
Croatia	0.14	Azerbaijan	0.15
Oman	0.14	Pakistan	0.14
Lebanon	0.12	Belarus	0.13
Panama	0.11	Ecuador	0.13
Serbia	0.11	Bulgaria	0.13
Jordan	0.10	Morocco	0.13
Dominican	0.10	Luxembourg	0.12
Costa Rica	0.10	Lithuania	0.11
Guatemala	0.10	Tunisia	0.11
Estonia	0.09	Trinidad and Tobago	0.10
Sri Lanka	0.08	Sudan	0.07
Kenya	0.08	Estonia	0.07
Latvia	0.08	Croatia	0.07
Bahrain	0.07	Cote d'Ivoire	0.06
Bosnia Herzegovina	0.06	Latvia	0.06
Ethiopia	0.06	Panama	0.05
Total	96.25	Total	93.01

Sources: *UN Comtrade*, authors' calculations.

Notes: Share of exporters and share of importers are calculated relative to total world imports.

ANNEX 2

Figure A1 Share of product category in total exports, 2000

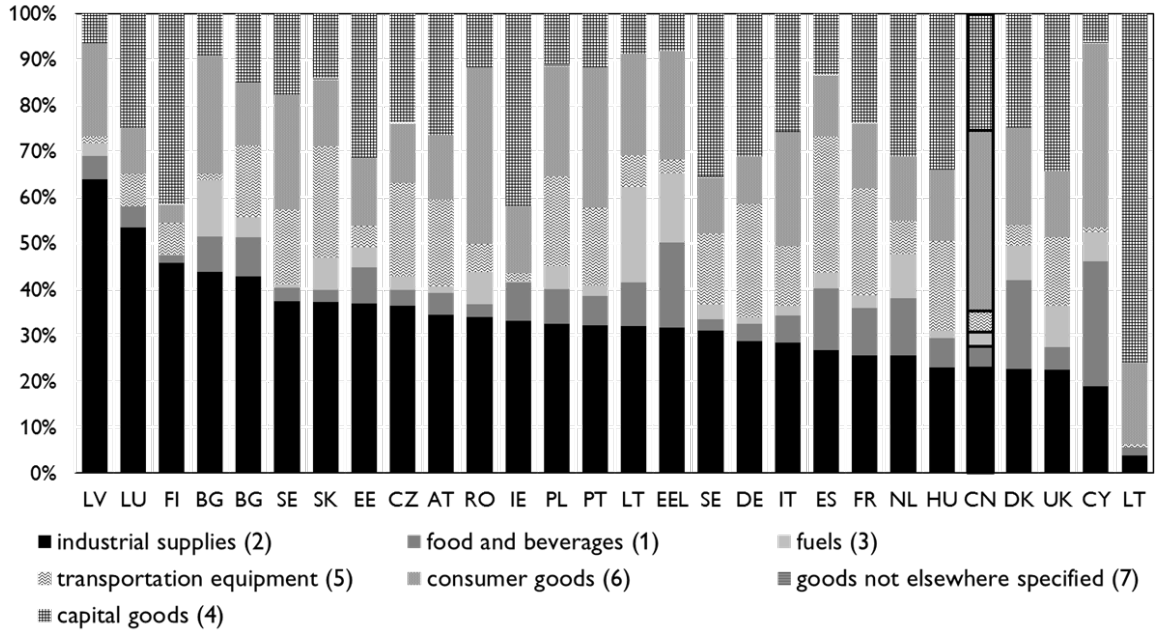


Figure A2 Average contribution of the extensive margin to export growth of industrial supplies

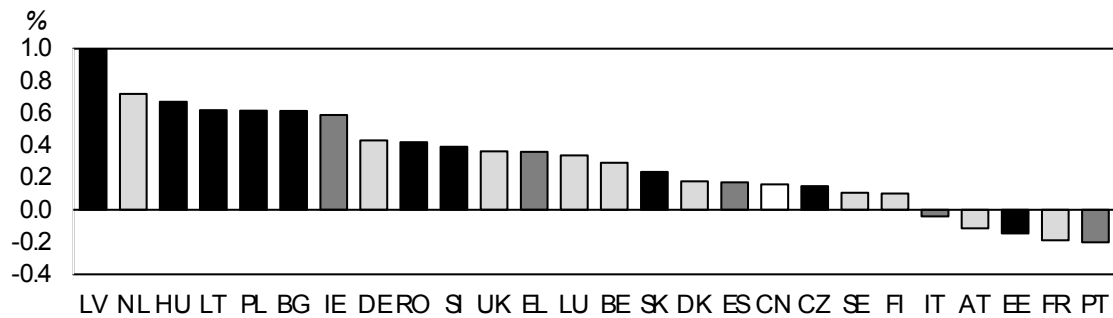
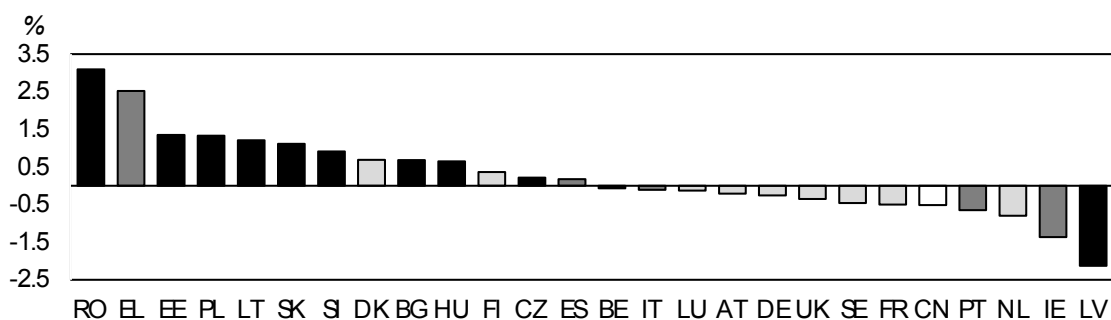


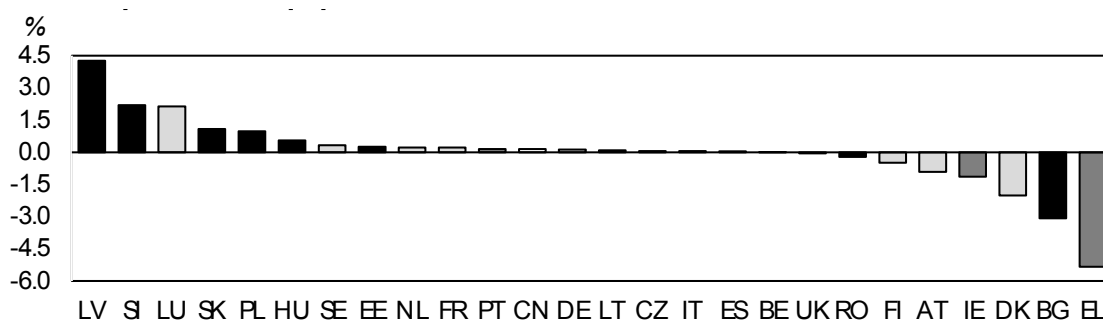
Figure A3 Average contribution of the extensive margin to export growth of capital goods



Source: UN COMTRADE, authors' calculations

Average from 2000 - 2010.

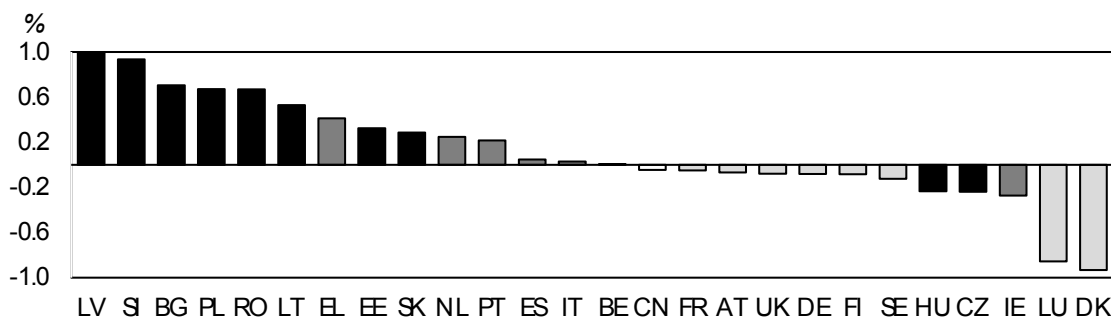
Figure A4 Average contribution of the extensive margin to export growth of transportation equipment



Source: UN COMTRADE, authors' calculations

Average from 2000 - 2010.

Figure A5 Average contribution of the extensive margin to export growth of consumer goods



Source: UN COMTRADE, authors' calculations

Average from 2000 - 2010.

Figure A6 No competition (ACTIVE-inactive)

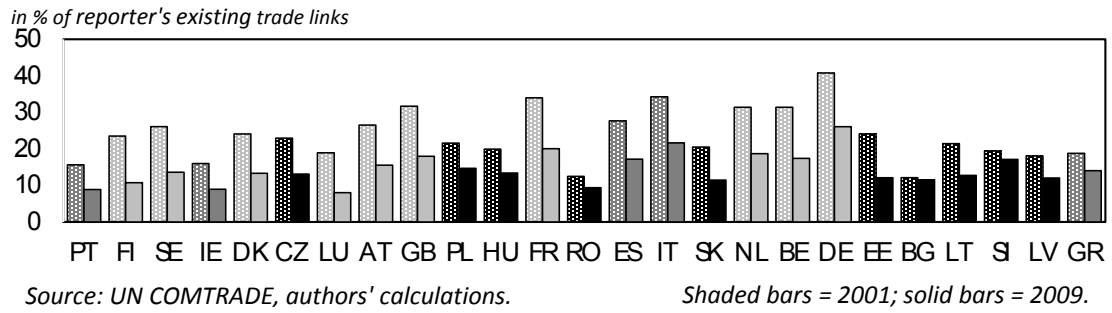


Figure A7 Leaving markets (EXIT-exit, EXIT-inactive)

