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Angela Cheptea, Lionel Fontagné, Soledad Zignago

► **To cite this version:**

| Angela Cheptea, Lionel Fontagné, Soledad Zignago. European Export Performance. 2020. <hal-01208836>

**HAL Id: hal-01208836**

**<https://hal.science/hal-01208836v1>**

Preprint submitted on 6 Jun 2020

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DOCUMENT  
DE TRAVAIL  
N° 393

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# European Export Performance <sup>\*</sup>

Angela Chepea<sup>†</sup>

Lionel Fontagné<sup>‡</sup>

Soledad Zignago<sup>§</sup>

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<sup>\*</sup>We thank the participants to the Banque de France Seminar, the PSE-Gmond Conference on Quality and Trade, and the XII Conference on International Economics (Castellón), as well as Guillaume Gaulier, Luciana Juvenal and Julia Woerth for their comments. This is a profoundly revised and extended version of CEPII Working Paper 2010-12. The views are those of the authors. Usual disclaimer applies. Tables of this paper present results only for large exporters. Results for all countries in the world are available in our personal webpages.

<sup>†</sup>INRA Rennes (Angela.Chepea@rennes.inra.fr).

<sup>‡</sup>PSE (Université Paris 1), European University Institute, Banque de France and CEPII (lionel.fontagne@univ-paris1.fr).

<sup>§</sup>Banque de France (soledad.zignago@banque-france.fr).

## Abstract

Competitiveness has come to the forefront of the policy debate within the European Union, focusing on price competitiveness and intra-EU imbalances. But how to measure properly competitiveness, beyond price or cost competitiveness, remains an open methodological issue; and what is the resilience of producers located in the EU to the competition of emerging economies is disregarded. We analyze the redistribution of world market shares at the level of product variety, as countries no longer specialize in sectors or even products, but in varieties of the same product, sold at different prices. We decompose changes in market shares into structural effects (geographic and sectoral) and a pure performance effect. Our method is based on an econometric shift-share decomposition and we consider the EU-27 as an integrated economy, excluding intra-EU trade. Revisiting the competitiveness issue in such perspective sheds new light on the ongoing debate. From 1995 to 2009 the EU-27 withstood the competition of emerging countries better than the US and Japan. The EU market shares in the upper price range of the market proved quite resilient, by cumulating good performance and favorable structure effects, contrary to the US and Japan. Finally, while most developed countries lose market shares in high-technology products to developing countries, the EU is slightly gaining, benefiting of a favorable structure effect.

*Keywords:* International Trade, Export Performance, Competitiveness, Market Shares, Shift-Share, European Union.

*JEL classification codes:* F12, F15.

## Résumé

La spécialisation des pays ne se fait plus au niveau des produits ou des secteurs, mais au niveau des variétés d'un même produit (vendues à des prix différents). Pour étudier la manière dont l'UE fait face à l'émergence de nouveaux grands exportateurs mondiaux, Chine en tête, nous analysons la redistribution mondiale des parts de marché dans ce contexte renouvelé. Pour distinguer ce qui relève de la performance de chaque exportateur des positions qu'il a acquises sur les différents marchés, nous décomposons les changements observés dans ses parts de marché (commerce mondial de biens hors intra-UE) en effets structurels (géographique et sectoriel) et un pur effet de performance. De 1994 à 2009, l'Union à 25 résiste mieux que les Etats-Unis et le Japon à la concurrence des émergents. Contrairement aux autres économies avancées, l'Europe gagne des parts de marché dans les produits de haute-technologie et maintient sa place de leader mondial dans le haut de gamme grâce à un bon positionnement dans les secteurs les plus demandés ainsi qu'à une assez bonne performance commerciale.

*Mots-clé :* Commerce international, Performance à l'exportation, Parts de marché, Analyse à parts de marché constantes, Shift-Share, Union européenne.

*Codes classification JEL :* F12; F15.

# 1 Introduction

The 2020 European Agenda focuses explicitly on competitiveness questions. Though the EU officially defines competitiveness in the broad sense as an economy's capacity to grow with full employment in a sustainable way (with respect to environmental and social pillars/aspects), the ongoing European debate on competitiveness is much more narrow focused. Internal current account imbalances within the EU, arguably explained by a divergence in price or cost competitiveness between Member states, are the central concern. Notwithstanding legitimate concerns regarding macroeconomic imbalances having fueled the debt crisis, such approach is however questionable for two reasons.

First, how to correctly assess competitiveness is a challenging issue as most of the action is taking place on the front of non-price competitiveness and is potentially affected by the products or destination markets exporters specialize in. For instance, Italy has exhibited poor price competitiveness over the recent years, with resilient market shares. In contrast, the improvement in Japanese price competitiveness did not prevent the deterioration of its world market shares. More fundamentally, the effective demand introduced in macroeconomic equations is by construction missing the sectoral or product dimension. Quality positioning, sectoral specialization and geographic orientation of exports contribute all to the observed changes in market shares.

Second, what ultimately matters for the EU as a whole, and more generally for high-income countries, is the capacity to uphold competition from emerging economies and low wage countries.<sup>1</sup> This broader perspective is justified by the fact that emerging countries have been winning large market shares over the last two decades. Among these, China stands out with the most remarkable performance: it almost tripled its world market share since 1995, reaching 17.1% in 2009. This competitive pressure is striking for the most technological products, where many of the new competitors have combined an increase in market share with a higher unit value of the exported products.

Our aim in this article is to disentangle observed changes in market shares into prod-

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<sup>1</sup>Interestingly, this view is not absent from the EU Commission philosophy, as the Directorate General trade action is guided by the axiom: *To build a stronger EU economy at home, Europe has to be more competitive abroad.* The US Department of Commerce uses a similar definition and focuses on *maximizing US competitiveness by enabling economic growth for American industries, workers, and consumers.*

uct or geographic specialization of exporters, and into pure performance. We develop an econometric *shift-share decomposition of exports growth* that identifies for each exporter the contribution to the intensive margin of (i) the composition of its exports by product and destination and (ii) its competitiveness. Accordingly, export growth for each country is broken down into three components: a geographic composition effect, a sectoral composition effect and an exporter effect capturing other sources of country’s export performance, including competitiveness. In line with a now abundant literature, we measure export performance at the level of the (vertically differentiated) variety of the traded products (Schott 2004, Hallak 2006, Baldwin & Ito 2008, Fontagné et al. 2008, Manova & Zhang 2011, Khandelwal 2010, Hallak & Schott 2011). We also have a focus on high-tech products. We adopt the viewpoint of an integrated European market and reconstruct world trade excluding intra-EU trade flows. The latter are considered as ”intranational” trade.<sup>2</sup>

The method we use brings several improvements with respect to the standard Constant Market Share (CMS) decomposition found in the literature (Tyszynski 1951, Richardson 1971*a,b*, Bowen & Pelzman 1984, Fagerberg 1988).<sup>3</sup> First, the competitiveness effect is estimated rather than computed as a residual of the analysis. Second, the econometric approach permits to drive out the non-orthogonality of product and market structure effects in standard CMS analyses, responsible for the fact that the order of the decomposition changes the results. In addition, we are able to identify confidence intervals for each product, market and exporter effect. Unlike the standard approach, our methodology permits to obtain results (effects) additive over the time dimension and thus take stock of changes in countries’ initial export structure.

To proceed, it is necessary to rely on very detailed and longitudinal trade data, covering all countries, including information on bilateral trade unit values. To this end, we rely on a database of international trade at the product level, BACI, developed by Gaulier & Zignago (2010). BACI provides (FOB) reconciled values, as well as unit values (values/quantities), of all international trade flows for about 5,000 product headings from the 6-digit Harmonised

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<sup>2</sup>67% of EU 27 exports are shipped into the Single European Market, where most of European countries record larger market shares benefitting from a somehow better market access.

<sup>3</sup>Alternative measures of country competitiveness have been used in the literature: comparative advantage, specialisation or productivity indicators, cost of leaving indices (Fagerberg 1988, Neary 2006, Delgado et al. 2012).

System classification (hereafter HS6), since 1994. We consider all exchanged products, *i.e.* the primary and the manufacturing sectors, with the exception of mineral products, notably oil, as well as some specific and non classified sectors. The availability of unit values enables us to classify flows by range of price and thus to analyze the positioning of exporters by price segment. We employ these data to examine changes in market shares of leading world exporters over the period 1995-2009. The *world distribution of unit values for each HS6 heading* allows us to classify each product-bilateral flow into three price segments, and examine competition within each of these segments.

In a context of sharp reshaping of world trade flows since the mid-1990s, we conclude that the redistribution of market shares observed between emerging and developed countries and among developing countries themselves has differently affected the EU, Japan, and the US. European market share losses arise mainly during the first half of the period (up to 2001) and fall mostly on old member states. The overall EU's good performance over the 1995-2009 period, compared to the United States or Japan, is associated with an original price-quality positioning of its products. The EU gains market shares in the upper price range of the market by cumulating good performance and favorable structure effects, contrary to the US and Japan which withdraw extensively from this segment. Finally, all developed countries lose market shares in high-technology products to developing countries, with the EU losing less than other countries.

The rest of the paper is organized as follows. We review the redistribution of world market shares in Section 2, with a focus on high-tech and top range products. Our econometric shift share analysis of export growth is implemented in Section 3. Section 4 concludes.

## **2 The redistribution of world market shares between 1995 and 2009**

The objective of this section is to take stock of the recent shifts in world market shares, taking into account the price segment and technological content of exported products at the most detailed available level of classification of traded products. We firstly characterize the

extensive and intensive margins of world trade, then we examine what have been the big swings in market shares, and we conclude with a focus on top range and high-tech products.

## 2.1 Changes in trade margins

Trade can increase either by exchanging a larger value of already traded products between the same partners (the intensive margin of trade), or by increasing the number of involved countries and/or exchanged products (the extensive margin of trade). The former refers to the change in the value of existing trade flows, while the latter refers to the change in the composition of trade flows. The entry of new competitors is reflected in the margins of world exports at the most disaggregated level of the product classification.<sup>4</sup> Hummels & Klenow (2005) use a cross-section of detailed trade data to identify the patterns of exports of 126 countries in 1995, and find that 60% of big economies' exports growth are attributed to shipments of a wider set of goods and the remaining 40% to larger quantities and higher prices of each good already shipped.

We adopt a similar approach but use the most detailed trade data compatible with an exhaustive set of exporters to compute the two margins for the whole matrix of trade flows.<sup>5</sup> Relying on information by product, market, exporter, and year, we compute the *extensive margin* of trade, defined as the change in the *number* of trade flows at the most detailed level, or as the *net value* of appearing and disappearing trade flows. Symmetrically, the *intensive margin* of trade is defined as the change in the value of trade flows that are present continuously throughout a given period. While a rapid turnover of trade flows can be observed – in a world matrix mostly filled of zeros – the largest contribution to the growth in the world trade value has been on the intensive margin.

Let us firstly consider the number of *potential* trade flows. A simple calculation would compare the 3.6 million trade flows observed in 1995 (see Table 1, Panel 1) with a potential

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<sup>4</sup>The extensive margin of exports so defined should not be confounded with the heterogeneous firms settings where trade introduces a selection between firms, as well as, in case of multi-product firms, a selection within the portfolio of products of each exporter.

<sup>5</sup>Hummels & Klenow (2005) rely on HS6 data on exports in 1995 by 110 countries to 59 importers. Alternatively, they rely on US imports from 119 countries in over 13,000 10-digit US tariff lines for the same year. Our approach also differs from Besedes & Prusa (2011) who integrate the time dimension into the analysis of export growth and breakdown the intensive margin into a survival and a deepening component.

of some 200 countries trading on a bilateral level in some 5,000 products. Accordingly, only a tiny percentage of the whole universe of trade flows would have been observed. However, simply taking the number of products times the number of exporters times the number of importers is misleading: most products are hardly exported by every country. Thus, we must compute this potential number by restricting it to situations where a product is at least exported by a country to one partner. Thus, for each year and product if a country reports its trade with at least one partner, trade flows with all unreported destinations are considered as true zeros and correspond to potential flows. Under this assumption, we get some 74 million potential trade flows in 1995 and 88 million in 2007. Accordingly, only 4.9 percent of the potential trade flows were actually observed in 1995 and 6.4 percent in 2007. The change in the number of countries is not the explanation of such increase: what matters is the product diversification of their exports.

Relying on the set of *observed* flows in Table 1 we compute the intensive and extensive change in the value of world trade between 1995 and 2009. In panel (1) of this Table we start by excluding mineral products, specific, and non-classified products.<sup>6</sup> The observed USD 4,204 bn 1995-2009 increase in world trade (column C) can be decomposed into three components. Firstly, the 2.3 million elementary bilateral trade flows existing in 1995 and still in place in 2009 (second line of Table 1) have increased their value by USD 3,428 bn. Accordingly, the intensive margin accounted for 81.6% of the change in the value of world trade (ratio of column D to column C). Secondly, one third of 1995 trade flows (1.34 million flows) have disappeared by 2009. This is the result of firms and countries ceasing trade with certain markets or certain products. In 1995 these trade flows amounted to USD 289 bn. Lastly, 3.07 million new country-partner-product trade flows appeared during the period, corresponding to the positive extensive margin of trade. This is a very large number, outpassing the number of initial trade flows. Overall, only 42.7% of the number of trade flows recorded in 2009 were also present in 1995. The remaining 57.3% are new flows (column E) either in terms of destination, exported products, or both. Meanwhile, the contribution of new entries to the 1995-2009 growth of trade in value terms was of only 14.4%. Exits

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<sup>6</sup>We exclude HS chapters 25, 26, 27, 97, 98, and 99 all along this paper, as detailed in Section 5.1 in the Appendix.

(column F) account for 25.1% of the number of 1995 flows but only for 3.9% of their value. Thus, although the exports of new products and/or to previously unexploited markets (trade relationships that ceased over the period), account for a large share of the total number of flows both in 1995 and 2009, they represent much less (10.5%) of the value increase in global trade.

Table 1: Extensive and intensive margins in world trade, 1995-2009

	Unit	1995	2009	$\Delta$	Intensive	Extensive		
		A	B	C= B-A	D	E	F	G =E-F
				(D+G)		Entries	Exits	Net
<i>Data at the HS 6-digit level:</i>								
All flows,	USD bn	3,197	7,400	4,204	3,428	1,065	289	776
intra-EU excl.	nb flows, 1000	3,629	5,354		2,286	3,068	1,343	1,725
<i>Data aggregated at the HS 2-digit level:</i>								
(1) All flows,	USD bn	3,197	7,400	4,204	3,935	298	29	269
intra-EU excl.	nb flows, 1000	369	526		289	236	80	156
(2) Our (reduced)	USD bn	3,179	7,339	4,159	4,095	353	289	64
sample	nb flows, 1000	270	384		3,904	933	818	115

Source: Authors' calculations using BACI values (current USD) of exchanged goods. Horizontal panel (1) combines all trade flows, excluding intra-EU trade and mineral, specific, and non-classified products. Horizontal panel (2) is obtained from panel (1) by excluding non-independent territories, micro-states and small flows (<10,000 USD). For each panel, we give figures in billion dollars and in thousands of HS6 or HS2 bilateral flows.

These results can be qualified by performing some sensitivity tests. Let us firstly aggregate trade flows at the HS 2-digit level. This yields indeed a considerably lower number of flows in each column of Table 1 and a larger relative importance of the intensive margin. The USD 4,204 bn increase in world trade decomposes as follows: 93.6% for the increase in the value of trade flows that survived throughout the period, 7.1% for new flows (entries), and 0.7% for trade flows that disappeared by 2009 (exits). Next, we can exclude non-independent territories and micro-states<sup>7</sup> as well as small flows (below USD 10,000), which account for a large share of the total number of individual bilateral trade flows but a

<sup>7</sup>Non-independent territories and certain small countries do not collect and report separately data on their foreign trade. We keep however Taiwan and Macao due to the large value of their trade.

very limited share of their value. Besides, these small flows are also excluded in section 3. When one combines these two corrections, we end up with a contribution of the extensive margin of 6.4% ( $267/4,159$ , figures not reported in Table 1), pointing to the robustness of our findings. Finally, in line with the methodology developed in Section 3, we may also choose to compute the intensive margin as the sum of annual changes in trade flows present in any two consecutive years rather than the change in the value of flows present in 1995 and 2009. The resulting extensive margin (panel (2) of Table 1) accounts only for a small fraction ( $1.5\%=64/4,159$ ) of the overall change in trade, which allows us to use a decomposition of changes in market shares relying on the intensive margin only.

The contribution of the different margins of trade can be computed for individual large exporters. Table 8 in the appendix compares the EU to other large exporters from the developed and the developing world. Computations are performed at the country level. For the ease of presentation, as well as in the rest of the paper, results for countries that account for less than 1% of world exports from 1995 to 2009 are aggregated under three groups – Middle East and North Africa (MENA), Sub-Saharan Africa (SSA), and Rest of the World (RoW). Results for all other countries are available in our online appendix.<sup>8</sup> We observe that the contribution of the positive extensive margin (entries) to the growth of the value of exports is very similar for the developed economies (less than 4%). This points out the pronounced inertia in the orientation of advanced exporters, in particular those from the US, Germany, UK, and Japanese exports. Their trade growth is mainly accounted for by expansion in existing markets (98.9%, 99.7%, 99.6% and 99.7% respectively). The contribution of the positive extensive margin is larger for emerging economies. It peaks for instance at 65.7% for Ukraine, 54% for Russia, or 25% for Greece. In average, the contribution of new flows in export growth for countries not reported in Table 8 is of 32%, clearly above individual exporters reported in the Table (for Middle East and North Africa this contribution is of 30% and for Sub-Saharan Africa of 16%). The lowest shares among developing countries are observed for China and Mexico, which show a structure of exports growth similar to the developed exporters. Mexico reaped the benefits of its preferential market to the huge US market, but did not manage to diversify its portfolio of products or markets over the

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<sup>8</sup>Zipped file at Soledad Zignago's Banque de France webpage and Lionel Fontagné's personal webpage.

considered period. In contrast, results for China also confirm the importance of the increased intensive margin, but the diversification of their exports was already accomplished in 1995 (China is shipping roughly as many different products as Germany).<sup>9</sup>

How did the different EU member states behave in terms of the two margins of trade? Did new member states have a better performance in the extensive margins of trade than former member states? Country level results show that old member states increased their exports mainly along the already established trade relationships. The relative importance of the intensive margin goes from 39.5% for Bulgaria to 99.9% for Finland (results available on our online appendix). For Denmark and Cyprus the negative extensive margin (exits) outpassed the positive one (entries), yielding a contribution of the intensive margin greater than 100%. On the opposite, new members exports' growth is acquired much more by developing new trade relationships. The contribution of the positive extensive margin to the growth of exports exceeds 18% for Baltic countries (reaching 40.2% for Latvia) and Malta. Among the fifteen old member states only Greece exhibit comparable figures. Since export baskets and destinations of the new EU members have been profoundly reshaped during the 1995-2009 period, the negative extensive margin is also larger for these countries. Still, the net extensive margin always accounts for less than half of the growth in country's exports.

In Section 3 we decompose the intensive margin of exports using an econometric shift-share methodology. Our objective is to rely on this decomposition to identify the changes in the determinants of the good resilience of EU market shares in the upper segment of the market.

## **2.2 EU market shares compared with main world exporters**

In Table 2, we summarise the recent shifts in world market shares as follows. The first three columns give the market share in 1995, 2007 (before the trade collapse), and 2009. In the three subsequent columns, we observe the percentage point changes in market shares for the whole period and for the two sub-periods (1995-2007 and 2008-2009).

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<sup>9</sup>Wang & Wei (2010) use export at product level for different Chinese cities and point to the role of human capital and government intervention in shaping a specialisation increasingly overlapping with high-income countries.

Table 2: Changes in world market shares for largest world exporters, 1995-2009

Exporter	Market shares, %			$\Delta$ , p.p.	
	1995	2007	2009	1995-2009	2007-2009
EU 27	20.7	19.5	19.4	-1.30	-0.09
France	2.8	2.3	2.5	-0.38	0.16
Germany	5.6	5.5	5.5	-0.16	-0.07
Italy	2.7	2.3	2.3	-0.43	-0.02
UK	2.8	2.0	1.9	-0.89	-0.09
Euro Area 12	15.7	14.9	14.9	-0.79	0.03
USA	18.3	13.0	12.5	-5.76	-0.51
Japan	14.2	8.9	8.0	-6.17	-0.86
Canada	5.3	3.8	3.1	-2.17	-0.75
Switzerland	2.8	2.3	2.4	-0.37	0.18
China	6.3	15.5	17.1	10.80	1.58
Brazil	1.4	1.7	1.7	0.29	0.02
India	1.1	1.7	2.1	1.02	0.40
Indonesia	1.2	1.2	1.3	0.11	0.05
Korea	3.8	4.4	4.7	0.89	0.32
Malaysia	2.4	2.1	2.1	-0.29	-0.01
Mexico	2.2	2.8	2.7	0.46	-0.13
Taiwan	3.7	3.6	3.3	-0.44	-0.31
Singapore	2.8	2.0	2.0	-0.73	0.02
Thailand	1.8	1.9	2.1	0.32	0.18
MENA	2.5	4.0	3.9	1.44	-0.10
Sub-Saharan Africa	1.5	1.6	1.6	0.06	-0.04
RoW	8.1	9.9	10.0	1.84	0.03

Source: Authors' calculations using BACI values (current USD) of exchanged goods. We exclude oil and intra-EU trade. The change in market shares is given in percentage points (p.p.). Results for countries accounting for less than 1% of world exports from 1995 to 2009 are aggregated under three groups: Middle East and North Africa (MENA), Sub-Saharan Africa (SSA), and Rest of the World (RoW).

The most remarkable evolution in Table 2 is that, China has more than doubled its world market share (its market share in 2009 is 2.7 larger than in 1995) becoming larger than the US as a super trader. In 1995, EU 27 had a 20.7% market share of world trade in goods, in a world excluding intra-EU flows. This market share has been only slightly affected by competitive pressures from emerging economies, down to 19.4% in 2009. Thus, the EU market share has been fairly affected by the eleven-point rise of China over the same period. In contrast, Japan and the US lose around 6 percentage points of market shares each.

The EU's export performance varies significantly between markets. The EU shows a decrease in market shares on some of the most dynamic importing markets during the last decade.<sup>10</sup> The largest gain is in the US market, where the EU accounted for over one fifth of the import market in 2007. This performance coincided with shrinking shares of Japanese and, to a lesser extent, of Canadian and ASEAN exports in the same market. Oppositely, the EU loses market shares on the Japanese and BRICs markets. The small market share loss of EU products on the rapidly expanding Chinese market can have, however, a high potential impact in the long run.

As the other emerging countries, the new European member states are doing better than the EU15. This may be linked to a shift of production lines from EU industrialised countries to new Member States, with lower costs. The exception is Ireland who has been the most successful exporter among the EU-15 group over the period, doubling its world market share. Poland, Hungary, Slovakia, and the Czech Republic also recorded large gains in market shares. On the contrary, the UK, Sweden, Italy, and Finland and France, and have experienced the greatest losses in their world market shares, as well as Cyprus and Bulgaria on the new Members States side.

Changes in market shares also vary across sectors as illustrated in Table 9 of the Appendix, which provides the sectoral composition of world and EU exported values and their evolution between 1995 and 2009, in current and constant terms.<sup>11</sup> Among the most performing sectors in terms of world values, the manufacture of basic metals, chemicals and machinery stand out. However, for chemicals and basic metals, their increased weight in the

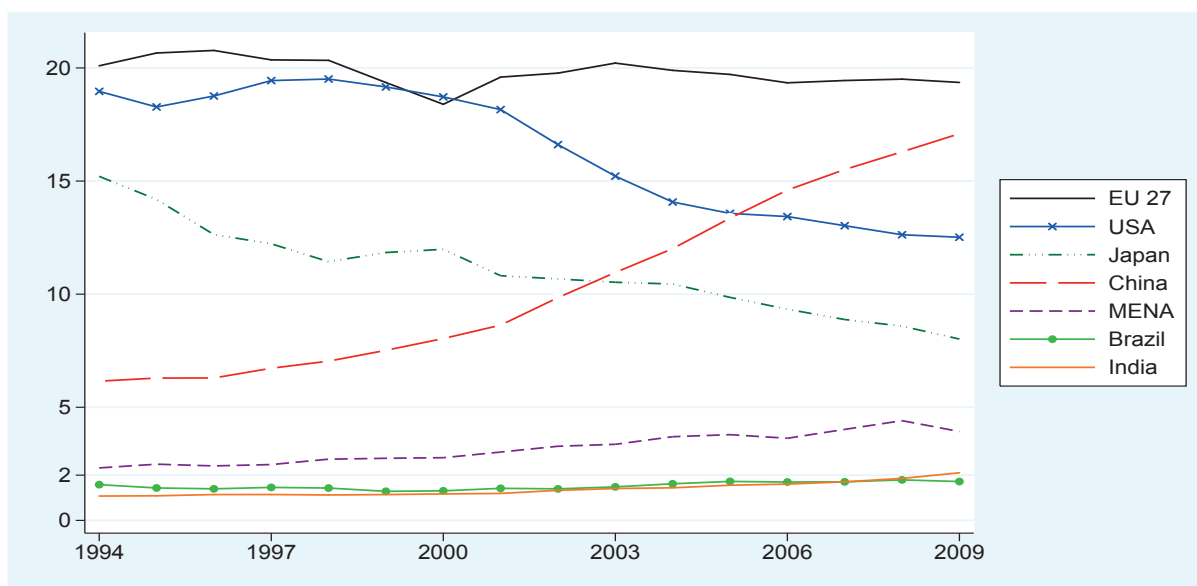
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<sup>10</sup>Results not shown in the paper but available upon request.

<sup>11</sup>Values are converted into volumes using chained Tornqvist indices of unit values. See the data appendix for more details on sources and methodologies used.

world market is largely explained by price effects (comparison between columns (5) and (6) of Table 9), which can be linked to oil prices evolutions for these two industries. Conversely, changes in machinery, radio, TV and other communication equipment, as well as in medical, precision and optical instruments are strong in terms of volumes than in values. The sectoral redistribution of European exports during the period has favoured chemicals but also the automotive industry, for which evolution in volumes are stronger than in values. Food, beverages, textiles, wearing, basic metals and computers are among sectors recording the largest losses in their share of European exports.

Figure 1: Evolution of world market shares, 1994-2009



Source: Authors' calculations using BACI values (current USD) of exchanged goods. Oil and intra-EU trade is excluded.

This redistribution of market shares must be gauged with the U-shaped evolution of the Euro-US dollar exchange rate throughout the period in the background. In Figure 1 we plot the evolution of world market shares for selected exporters, also summarised in columns 1 to 3 of Table 2. EU's market shares decreased more during the late 90s than in the early 2000s. Despite the appreciation of the Euro, the early 2000s were a period of partial recovery for the EU exports, with most of its previous losses recuperated. Among other industrialised countries, Japan continued to lose market shares in the second sub-period. All of the US losses are also concentrated in that period. The Chinese competitive pressure has increased

since 2000, and not all emerging markets have managed to cope with this.<sup>12</sup>

Overall, the economic crisis has not changed the redistribution of world market shares within global exporters. The last column of Table 2 gives the percentage point change in the two-years-period covering the great trade collapse<sup>13</sup>, 2008-2009. The crisis seems to confirm the long-run trends above mentioned: the Chinese performance (+1.6 p.p. gain of world market share between 2007 and 2009), the vulnerability of Japanese and North-American exporters and the European resilience. The online appendix show that the main changes observed between the period 1995-2007 and the period 2008-2009 relies on the sectoral composition of demand. Whereas transformed products gain market shares in the period 1995-2007, the crisis collapsed their demand. Conversely, consumption goods more than compensate their previous losses in the last two years. In terms of technological content, resource-based and mid-tech manufactures have recorded the big losses during the crisis, to the benefit of primary products and to high-tech manufactures. The next sub-section details the technological dimension of larger exporters specialization and turns to another dimension of international competition: performances differ within categories of products according to the market positioning of varieties. This is fundamentally where the action is for European exporters.

### **2.3 Performances in high-tech and top range products**

High-tech and top range quality products play an important role in international competition, since they are basically the output of innovation and the very source of rents. Leamer (1987) pioneered the idea that what you export matters. Hausmann et al. (2007) went one step further by characterizing the proximity of specialization between advanced and emerging countries at the HS6 product level. They show the “income level of a country’s exports” is a determinant of subsequent growth.

We firstly focus here on high-tech products, we rely on the classification proposed by Lall (2000). Sectors are classified into primary products, resource-based manufactures, low,

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<sup>12</sup>For instance, results available in our online appendix show disappointing performances for Mexico and ASEAN countries since 2000.

<sup>13</sup>Record negative export growth rates were attained between the last quarter 2008 and the first half 2009 for most countries in the world.

medium and high-technology manufactures, and other transactions. The high-tech category comprises electronics and electrical products, as well as pharmaceutical products, aerospace, optical and measuring instruments, cameras, etc. (see Table 7 in the Appendix for the sectors classified in the other categories).

Results concerning high-tech products are reported in the first two columns of Table 3. The first one gives the world market shares for high-tech products in 2009, the second one their change in percentage points over the period 1995-2009. The EU is gaining market share in high-tech products: a 1.55 p.p. gain compared to a loss of 1.30 p.p. for all products together (column 4 of Table 2). The United States and Japan, on the other hand, recorded losses twice as large as for all products (respectively 10 p.p. and 12 p.p., as shown in the second column of Table 3). In the meantime, Chinese gains are very large on the high-tech market (17 p.p.), due to a massive relocation of the assembly of these products to mainland China.

Besides trade similarity in terms of product categories, trade flows with persistently dissimilar prices can be observed within the most narrowly defined products. Though high-income and emerging economies export rather similar bundles of goods, they actually compete within industries, on different price-quality ranges (Schott 2004, 2008, Fontagné et al. 2008). Hence, specialization occurs inside these categories, on vertically differentiated varieties of products. However, quality is not directly observable. Hallak (2006) refers to product quality as to a demand shifter that captures all attributes of a product valued by consumers. Conditional on price, a higher quality increases income share spent on a given variety. Using this definition, he finds that cross-country variation in unit values can be attributed to differences in quality. Competitiveness ultimately depends upon the quality-adjusted price (Baldwin & Harrigan 2011). Baldwin & Ito (2008) classify products according to the related market structures (price competition versus quality competition) for nine big exporters in the period 1997-2006. Estimating the price-distance relationship separately for each product, they observe more “quality-competition goods” in EU exports than in US and Japanese exports, and a very low share of “quality-competition goods” in Chinese exports. Unit values can reflect not only quality but also costs (Khandelwal 2010). Idiosyncratic preferences for

Table 3: Change in world market shares for high-tech products and by market segment, 1995-2009

Exporter	High-tech products		Up-market		Mid-market		Low-market	
	2009 %	95-09 p.p. $\Delta$	2009 %	95-09 p.p. $\Delta$	2009 %	95-09 p.p. $\Delta$	2009 %	95-09 p.p. $\Delta$
EU27	18.1	1.55	28.8	-0.89	17.1	-2.64	15.2	-3.20
France	3.3	0.10	3.4	-0.63	2.3	-0.73	1.9	-0.51
Germany	4.7	0.66	8.8	-0.97	5.1	-0.61	3.4	-0.54
Italy	1.2	-0.03	3.1	-0.03	1.9	-0.44	2.1	-0.97
United Kingdom	2.0	-0.99	2.9	-0.86	1.7	-0.93	1.5	-1.07
Euro Area 12	13.5	1.74	22.7	-0.53	13.2	-1.92	11.2	-2.33
USA	13.4	-9.97	13.0	-5.04	13.9	-2.96	10.5	-6.86
Japan	7.3	-12.29	11.0	-8.20	8.8	-9.10	4.2	-5.31
Canada	1.9	-0.70	1.8	-0.99	4.7	-0.98	2.4	-3.17
Switzerland	2.9	0.56	4.8	-0.35	1.6	-0.85	1.6	0.43
China	21.4	16.62	11.6	8.88	16.4	10.76	22.9	13.18
Brazil	0.6	0.33	1.1	0.21	2.3	0.64	1.8	-0.25
India	0.9	0.73	1.2	0.78	1.6	0.75	2.7	1.29
Indonesia	0.6	0.25	0.9	0.03	1.5	-0.07	1.5	0.08
Korea	6.5	1.22	2.8	-0.18	4.6	0.35	6.8	1.75
Malaysia	4.1	-0.59	2.3	0.93	1.9	-0.20	2.1	-0.37
Mexico	3.2	1.07	1.4	0.49	4.0	2.16	2.5	-1.47
Taiwan	7.0	1.56	2.2	0.35	2.5	-0.01	4.1	-0.85
Singapore	3.5	-3.41	2.1	-0.77	1.6	-0.48	2.0	0.05
Thailand	2.3	0.13	1.9	0.33	2.5	1.00	1.9	-0.29
MENA	1.6	0.74	3.3	1.17	3.7	1.23	4.3	1.92
SSA	0.2	0.08	1.3	0.55	1.8	0.07	1.6	0.43
RoW	4.5	2.13	8.6	2.70	9.6	0.33	12.0	2.64

Source: Authors' calculations using BACI values (current USD) of exchanged goods. We exclude oil and intra-EU trade. The change in market shares is given in percentage points (p.p.). Results for countries accounting for less than 1% of world exports from 1995 to 2009 are aggregated under three groups: Middle East and North Africa (MENA), Sub-Saharan Africa (SSA), and Rest of the World (RoW).

products' horizontal attributes may also induce exports of goods of same quality at different prices. Finally, export prices may vary for reasons other than quality or costs (Hallak & Schott 2011). Our approach is accordingly to examine changes in market shares by price-range. If a country exports are spotted in the high price range but exhibit quality that does not deserve such pricing, market shares will shrink.

The procedure we use deserves more explanation since it aims at tackling the within trade

flows heterogeneity. We rely on the distribution of unit values for each HS6 product and year, based on the assumption of a continuum of vertically differentiated products. Notice first that, for a given exporting country, the HS6 data is actually aggregating different flows under a unique heading, reported by several firms on several dates by year. Hence each “flow” reported by the trade statistics will be hardly classified under a unique single vertical specialization positioning. Accordingly, we rely on a smoother procedure, used by Fontagné et al. (2008), that splits each elementary trade flow into two adjacent ranges of prices out of the three considered (low, medium, high). More specifically, if  $i$  is the exporter,  $j$  the destination market,  $k$  the product, and  $t$  the year, the relative unit value of a bilateral flow, noted  $r = r_{ijkt}$ , is obtained as the ratio between the bilateral unit value and the trade weighted geometric average of all unit values in the world for the product and year concerned.<sup>14</sup> If  $r < 1$ , then the *value* allocated to the low range is  $X_{ijkt}(1 - r^\alpha)$  and the value in medium range is  $r^\alpha X_{ijkt}$ . If  $r > 1$ , then the value allocated to high range is  $X_{ijkt}(1 - 1/r^\alpha)$  and the value allocated to the medium range is  $X_{ijkt}(1/r^\alpha)$ . The lower  $\alpha$ , the higher the share of trade in the medium range (here we use  $\alpha = 4$  to end up with similar size groups).<sup>15</sup> Overall, we decompose each bilateral value ( $X_{ijkt}$ ) across an additional dimension  $s$ , corresponding to the market segment ( $s = low, mid, up$ ).

Implementing this procedure, we observe the market positioning of exported products, as described in Table 3. The remaining three pairs of columns in this Table give the world market shares in 2009, and their change in percentage points over the period 1995-2009 for each of the three market segments (low, middle, up). EU’s leadership for up-market exports is ascertained, with almost 29% of the world market. The EU has a market share that is almost twice as high for top range products compared to those in the middle or lower range. The United States and Japan exhibit a quite different pattern, with similar world market shares in up- and mid-market products and less important market shares in low-

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<sup>14</sup>Noting  $UV$  the unit values and  $V$  the trade values used as weights, the relative unit value is:

$$r = r_{ijkt} = \frac{UV_{ijkt}}{(\prod_{ij} UV_{ijkt}^{V_{ijkt}})^{1/\sum_{ij} V_{ijkt}}}$$

<sup>15</sup>Since quantities are not systematically reported, we assume that non allocated flows (in terms of unit values) are distributed by market segment in the same way as allocated flows.

market products. Both countries are losing ground in all ranges of products. Differently, the resilience of the EU market share for top range products is remarkable, with less than one percent point of world market lost over the whole period. An in-depth look shows that this loss occurred since the crisis, in the period 2008-2009. Chinese gains are concentrated in the middle and the bottom segments of the market, although Chinese exporters (actually mostly foreign firms assembling in China) have started to gain market shares in the upper segment of the market.

The evidence provided so far is purely descriptive. We cannot identify the pure performance of exporting countries on this basis, as changes in market shares can be also driven by composition effects. The next section aims at disentangling composition effects from pure competitiveness. This will be done for different ranges of vertically differentiated varieties of traded products.

### **3 An econometric shift-share analysis of exports growth**

This section aims at identifying the contributions to the exports growth: what are the product and market composition effects and what resorts to pure competitiveness? One of the simplest ways to investigate growth rates is the *shift-share* approach, also known as the constant market share (CMS) analysis or structural decomposition. Fabricant (1942) and Maddison (1952) were among the first to formalize the shift-share decomposition, which was extensively used afterwards. Although employed mainly in regional studies on employment and productivity growth, this technique has been successfully extended to international trade issues over the last six decades (Tyszynski 1951, Richardson 1971*a,b*, Fagerberg 1988). The method has been extensively used in competitiveness studies. Laursen (1999), Wörz (2005), Brenton & Newfarmer (2007), or Cafiso (2009) are examples of papers using the structural decomposition to analyse export performances at the country level. In the context of the recent economic crisis it gained interest among central bank researchers (ECB 2005, Amador & Cabral 2008, Jiménez & Martín 2010, Panagiotis et al. 2010, Finicelli et al. 2011).

Instead of following this traditional decomposition, we adopt an econometric approach, taking benefit of the data disaggregation. In addition, in order to capture variations across

time, we focus on the sum of annual growths of each trade flow rather than on the increase in its value between the first and last year of the considered period. Therefore, our method is constrained by the observation of the same flow in two consecutive years (necessary for computing annual growth rates). As in panel 2 of Table 1, we exclude flows under USD 10,000 and those concerning micro-states. The 3.9 million flows that satisfy these conditions account for a trade growth of bn USD 4,095. This figure does not include trade flows created (bn USD 353) or disappeared (bn USD 289) throughout the period, and is larger than the intensive margin of panel (1) in Table 1. As previously, market positioning in terms of technology or quality is computed from HS6 level data. However, in order to capture even more of trade flows in the intensive margin, the decomposition of export growths is performed on data aggregated to the 2-digits level of the HS classification.

### 3.1 The shift-share methodology applied to changes in market shares

In the field of international trade, the CMS or shift-share analysis aims to measure the contribution of countries' geographical and sectoral specialization to the growth of their exports. Since the analysis is performed on exports growth, only the intensive margin of trade is explained. The method simply aims at computing the contribution of the initial geographical and sectoral composition of exports to changes in market shares. The remaining part of the change is attributed to pure performance (*i.e.* price and non-price competitiveness).

The traditional shift-share analysis is based on an algebraic decomposition of the total exports growth of a country (or a region) during a given time period. Four contributions are identified, namely world trade growth, growth in exports of individual products (sectoral effect), growth in imports of specific markets (geographical effect), and a residual performance of the exporter.<sup>16</sup> here are three components when market shares are considered, as is the

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<sup>16</sup>The following equation gives this identity:

$$X_{i..}^t - X_{i..}^{t-1} = rX_{i..}^{t-1} + \sum_k (r_k - r) X_{i.k}^{t-1} + \sum_{jk} (r_{jk} - r_k) X_{ijk}^{t-1} + \sum_{jk} \left( X_{ijk}^t - X_{ijk}^{t-1} (1 + r_{jk}) \right)$$

where  $i$  denotes the exporter,  $j$  the importer,  $k$  the product or sector,  $t$  the time period,  $r$  the global growth rate of exports for all countries in the sample except  $i$ ,  $r_k$  the global growth rate of product  $k$  exports, and  $r_{jk}$  the global growth rate of exports of product  $k$  to country  $j$ .

case in this work, instead of export growth. Such structural decomposition has a major drawback: results are sensitive to the order in which the composition effects are considered. Computing sectoral effects first and geographical effects afterwards and *vice versa* yields different results.

Departing from this traditional analysis, we rely here on a shift-share methodology based on econometrics, proposed by Cheptea et al. (2005), which is a further development of Jayet (1993) weighted variance analysis of growth rates.<sup>17</sup> The aim of this method is ultimately to decompose the growth of each country’s world market shares into three terms: a geographic structure effect, a sectoral effect, and an exporter-effect which represents the exporter’s performance. To compute country-level structural and performance effects, we first explain the growth rate of each individual trade flow (from each exporter to each importer for a given product and year) and, in a second step we aggregate results at the exporter level.

Let  $w^t$  denote the average weight of a flow in world trade in years  $t - 1$  and  $t$ :  $w_{ijk}^t = \frac{1}{2} \left( \frac{X_{ijk}^{t-1}}{X^{t-1}} + \frac{X_{ijk}^t}{X^t} \right)$  and  $w_i^t = \frac{1}{2} \left( \frac{X_i^{t-1}}{X^{t-1}} + \frac{X_i^t}{X^t} \right)$ . The bilateral and sectoral exports growth rates are regressed on dummies identifying exporters ( $i$ ), importers ( $j$ ) and HS2 groups of products ( $k$ ) with weighted, by  $w_{ijk}^t$ , OLS:

$$\ln \left( \frac{X_{ijk}^t}{X_{ijk}^{t-1}} \right) = intercept^t + \alpha_i^t + \beta_j^t + \gamma_k^t + \varepsilon_{ijk}^t. \quad (1)$$

where  $X$  represents the value of exports,  $\beta_j^t$  and  $\gamma_k^t$  capture the contribution of the average geographic and product structure in year  $t$  to the annual growth rate of exports between  $t - 1$  and  $t$ ,  $\alpha_i^t$  is the amount of growth in  $t$  that can be attributed to the export performance of country  $i$ , and  $intercept^t$  is a constant term. More than half of the fixed effects exhibit an absolute value of the t-test larger than 2 (the distributions are plotted in Figures 2 to 4 in the Appendix). The above decomposition is done for each year between 1995 and 2007. We estimate thus thirteen annual effects for each exporter, importer and product.<sup>18</sup>

Differently from Cheptea et al. (2005), the growth rate of country  $i$ ’s exports is computed here as the logarithm of the Törnqvist index of its exports of each product  $k$  to each partner

<sup>17</sup>The traditional shift-share analysis is actually a constrained and imperfect version of regression and variance analysis techniques.

<sup>18</sup>Data on 1994 flows serve as base year for 1994-1995 growth rates.

$j$ .<sup>19</sup> The annual growth of country  $i$ 's exports in period  $t$  is obtained as an approximation of the true logarithmic change in its exports:

$$d \ln X_i^t = \ln \left( \frac{X_i^t}{X_i^{t-1}} \right) \approx \sum_{jk} \frac{w_{ijk}^t}{w_i^t} \ln \left( \frac{X_{ijk}^t}{X_{ijk}^{t-1}} \right). \quad (2)$$

Thus, we express the growth of country  $i$ 's exports as a weighted average of the logarithmic change in its exports of each product  $k$  to each partner  $j$ .<sup>20</sup>

Combining equations (1) and (2), we can express the overall growth of country  $i$  exports in terms of the three types of effects mentioned above:

$$d \ln X_i^t = \text{intercept}^t + \alpha_i^t + \sum_j \frac{w_{ij}^t}{w_i^t} \beta_j^t + \sum_k \frac{w_{ik}^t}{w_i^t} \gamma_k^t. \quad (3)$$

To reach equation (3) we use the fact that the weights of all flows involving exporting country  $i$  sum to the weight of its exports in world trade,  $w_i^t = \sum_{jk} w_{ijk}^t$ , and that the sample weighted average of the error term in (1) is equal to zero,  $\sum_{jk} w_{ijk}^t \varepsilon_{ijk}^t = 0$ .<sup>21</sup> Given the large size of our sample (over 200,000 observations per year), the identity established by (3) is almost unaltered if we replace the constant term, exporter, importer, and product effects by their OLS estimates.

Let hats indicate OLS-estimated coefficients in (1). When estimating (1), one individual for each set of fixed effects has to be removed because of collinearity. Therefore,  $\hat{\alpha}_i^t$  is a measure of country  $i$ 's 'pure' exports growth relatively to the omitted country. A measure of country  $i$ 's effect independent of the choice of the omitted country is given by the *least square mean* (hereafter *LSMEAN*), obtained by adding the intercept and the weighted mean

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<sup>19</sup>The Törnqvist index is the weighted geometric average of the relative change between the current and base period where weights are the arithmetic average of the shares in the two periods.

<sup>20</sup>Although at the exporter/importer/product level the difference between growth rates computed according to the two sides of the above equation may vary significantly, the weighted averages at the level of each exporter are very similar. For example for France the difference between the two weighted means represents at most 6% of the largest of the two values. For Germany the difference is even smaller.

<sup>21</sup>The last constraint is implicitly imposed when estimating (1) with weighted OLS.

of partner and product effects to the estimated effect:

$$LSMEAN_i^t = \hat{\alpha}_i^t + intercept^t + \sum_j w_j^t \hat{\beta}_j^t + \sum_k w_k^t \hat{\gamma}_k^t. \quad (4)$$

Note, that the weighted average of country-specific ‘pure’ exports growths gives the growth rate of world trade:  $\sum_i w_i^t LSMEAN_i^t = \sum_{ijk} w_{ijk}^t \ln \left( \frac{X_{ijk}^t}{X_{ijk}^{t-1}} \right) = d \ln X^t$ . We employ the fact that the sum of weights across any dimension is equal to one ( $\sum_i w_i^t = \sum_j w_j^t = \sum_k w_k^t = 1$ ) to establish this result.

For similar reasons, we normalise the estimated importer and product effects. The new values are obtained by subtracting the weighted average of estimated effects from the parameters estimated originally:  $\tilde{\beta}_j^t = \hat{\beta}_j^t - \sum_j w_j^t \hat{\beta}_j^t$  and  $\tilde{\gamma}_k^t = \hat{\gamma}_k^t - \sum_k w_k^t \hat{\gamma}_k^t$ . Note that with these notations equation (1) becomes  $\ln \left( \frac{X_{ijk}^t}{X_{ijk}^{t-1}} \right) = LSMEAN_i^t + \tilde{\beta}_j^t + \tilde{\gamma}_k^t + \varepsilon_{ijk}^t$ . The decomposition (3) can then be re-written as:

$$d \ln X_i^t = LSMEAN_i^t + \sum_j \frac{w_{ij}^t}{w_i^t} \tilde{\beta}_j^t + \sum_k \frac{w_{ik}^t}{w_i^t} \tilde{\gamma}_k^t. \quad (5)$$

The first right hand side element of (5) represents the *exports performance* of country  $i$ . The last two terms reflect the contribution of its exports structure by partner and product to the overall growth of its exports. We refer to them as the *geographic* and *sectoral structure* effects.

We decompose, thus, the growth of each country’s exports into three terms: an exporter (performance) effect, a geographic structure effect which depends on the destination of exports, and a sectoral effect that varies with the sectoral composition of exports. The decomposition of exports growth is done separately for each year. Note that the sum of annual growth rates yields the change in the value of exports between the first and last year of the period. Therefore, results for the entire 1995-2007 period are obtained by summing up the different effects across years:

$$d \ln X_i^{95-07} \equiv \sum_t d \ln X_i^t = \sum_t LSMEAN_i^t + \sum_t \left( \sum_j \frac{w_{ij}^t}{w_i^t} \tilde{\beta}_j^t \right) + \sum_t \left( \sum_k \frac{w_{ik}^t}{w_i^t} \tilde{\gamma}_k^t \right). \quad (6)$$

Let us consider an illustrative example. According to our methodology, the growth of Chinese exports in year 2000 (relative to year 1999) is equal to the sum of the Chinese export performance in 2000, the effect of the average geographic orientation and that of the average product composition of Chinese exports in 2000. The 1995-2007 growth of exports from China is the sum of these three effects computed for each year of the period.<sup>22</sup>

Now, we can transpose this decomposition into a decomposition of changes in market shares. For this, we subtract to both left and right hand side expressions of (6) the logarithmic change in world exports over the period computed as a Torqvist index,  $d \ln X^{95-07}$ , and take the exponentials of the resulting expressions.<sup>23</sup> We obtain:

$$g_i^{95-07} \equiv \exp(d \ln X_i^{95-07} - d \ln X^{95-07}) - 1 = PERF_i \times GEO_i \times SECT_i - 1 \quad (7)$$

where  $PERF_i = \exp(\sum_t LSMEAN_i^t - d \ln X^{95-07})$ , and  $GEO_i$  and  $SECT_i$  are the exponentials of the last two terms of the right hand side expression of equation (6). Note that  $d \ln X_i^{95-07}$  and  $d \ln X^{95-07}$  are approximations of true logarithmic changes in country and world exports obtained with the Törnqvist index.<sup>24</sup> Therefore,  $g_i^{95-07}$  in equation (7) is an approximation of the actual market share growth rate.<sup>25</sup>

Exporting countries have no influence on structural effects affecting their exports. These effects result from the growth in destination markets, given the geographical and sectoral composition of exports. In contrast, the performance effect is a true competitiveness effect. It indicates the degree to which the exporting country was able to gain or lose market shares, after controlling for composition effects.

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<sup>22</sup>Figures corresponding to this example are displayed in the upper part of Table ??.

<sup>23</sup>Accordingly, we have  $d \ln X^{95-07} \equiv \sum_t (d \ln X^t) = \sum_t \left( \sum_i w_i^t d \ln X_i^t \right)$ .

<sup>24</sup> $\tilde{d} \ln X_i^{95-07} \approx \ln(X_i^{2007}/X_i^{1995})$  and  $\tilde{d} \ln X^{95-07} \approx \ln(X^{2007}/X^{1995})$ .

<sup>25</sup>Actual (true) market share growth rates are obtained as  $\left( \frac{X_i^{2007}}{X^{2007}} - \frac{X_i^{1995}}{X^{1995}} \right) / \left( \frac{X_i^{1995}}{X^{1995}} \right)$ .

### 3.2 Contributions to the changes in world market shares: all products

We now report the results of the shift-share analysis. We explain the annual growth of all trade flows existing in any two consecutive years and aggregate results in terms of market shares over the period 1995-2009.<sup>26</sup> The estimation is performed at the 2-digit level of the HS: the 6-digit level does not give very different results, while the HS2 secures higher statistical significance of parameter estimates. However we continue to define unit values ranges and technological products at the HS6 level. The statistical significance of fixed effects  $\alpha_i^t$ ,  $\beta_j^t$ , and  $\gamma_k^t$  by year is shown in Figure 2 in the Appendix.

Table 4 shows the differences between market shares considered in this section and those in section 2. The first column in Table 4 reports the changes in market shares between 1995 and 2009 as presented in Table 2 (e.g. the EU25 loses 1.3 p.p. of the world market shares). The following three columns consider the change in world market shares by focusing on the intensive margins of trade only and excluding minor flows, i.e. using the exact sample on which we perform the shift-share analysis. Column (2) gives changes in market shares computed on flows existing in any two consecutive years. Note that the difference between column (1) and column (2) is negligible for all countries. This indicates that the change in market shares for the shift-share sample is a good proxy of the change in market shares computed from all trade flows. Column (3) provides the same information as column (2), but now expressed in percentage terms (the 1.49 p.p. loss of the EU25 represents 7.2% of the value of its exports in 1995). Column (4) displays the change in world market shares as computed with the Tornqvist index, i.e.  $g_i^{95-07}$  from equation (7). It is this change that is decomposed by our shift-share analysis (last three columns).

To clarify the difference between the different columns of Table 4, let us consider the case of Chinese exports. In 1995 Chinese exports represented only 6.3% of the value of world trade; they increased by the year 2009 by 10.80 p.p. When we exclude the extensive margin (flows that appeared and disappeared over the period) and minor flows, the market share

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<sup>26</sup>As mentioned above, the sample used eliminates the noise associated with tiny values (below USD 10,000), non-independent territories and micro-states, and drops HS sections 25, 26, 27, 97, 98, 99 (mineral, specific and non-classified products).

Table 4: Changes in world market shares for large exporters (overall growth and intensive margin) and shift-share decomposition, 1995-2009

	Overall	Intensive margin			Shift-share		
	p.p., panel (1)	p.p.	%	%	Structural Effects		Export
	of Table 1	panel (2) of Table 1	eq.(7)		geographic	sectoral	performance
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
EU27	-1.30	-1.49	-7.2	-5.4	7.4	9.7	-19.7
France	-0.38	-0.41	-14.4	-13.2	10.0	16.8	-32.5
Germany	-0.16	-0.17	-3.1	-1.1	6.2	10.1	-15.5
Italy	-0.43	-0.45	-16.5	-15.0	11.7	-6.0	-19.0
UK	-0.89	-0.90	-32.1	-34.7	1.4	17.8	-45.4
Euro Area	-0.79	-0.88	-5.6	-3.6	7.6	9.1	-18.0
USA	-5.76	-5.79	-31.7	-31.2	4.8	9.9	-40.3
Japan	-6.17	-6.18	-43.6	-44.0	0.5	6.3	-47.6
Canada	-2.17	-2.17	-41.4	-40.6	-22.5	-0.3	-23.1
Switzerland	-0.37	-0.38	-13.5	-9.4	-0.6	25.3	-27.2
China	10.80	10.76	171.1	180.9	-15.1	-20.8	317.3
Brazil	0.29	0.23	15.9	22.4	-1.8	-11.3	40.5
India	1.02	0.99	91.2	98.3	5.9	-16.6	124.4
Indonesia	0.11	0.10	8.3	13.3	-6.7	-21.8	55.3
Korea	0.89	0.71	18.7	21.7	8.4	-0.8	13.1
Malaysia	-0.29	-0.31	-12.7	-11.4	-8.4	-1.3	-1.9
Mexico	0.46	0.45	20.4	23.0	-23.0	-0.9	61.1
Taiwan	-0.44	-0.50	-13.5	-13.7	14.6	-4.5	-21.2
Singapore	-0.73	-0.72	-26.2	-20.4	5.1	8.6	-30.2
Thailand	0.32	0.32	17.7	20.4	-5.1	-10.5	41.8
MENA	1.44	1.60	64.4	61.6	14.0	-10.4	58.2
SSA	0.06	-0.02	-1.1	-4.6	-0.9	-8.4	5.1
RoW	1.84	0.94	11.6	11.6	3.4	-13.6	24.9

Source: Authors' calculations. Figures in column (1) are obtained using the sample of the panel (1) of Table 1. The difference between columns (1) and (2) are due to the exclusion of the extensive margin and tiny trade flows (below USD 10,000, involving non-independent territories and micro-states) in the latter. Column (3) provides the same information as column (2), but now expressed in % change relatively to the 1995 market share. Column (4) is the approximation of the Törnqvist index. The shift-share estimation is performed at the 2-digit level of the HS (figures are expressed in terms of percentage change in market share). The four last columns correspond to  $g_i \cdot 100$ ,  $(SECT_i - 1) \cdot 100$ ,  $(GEO_i - 1) \cdot 100$  and respectively  $(PERF_i - 1) \cdot 100$ , from equation (7). Results for countries accounting for less than 1% of world exports from 1995 to 2009 are aggregated under three groups: Middle East and North Africa (MENA), Sub-Saharan Africa (SSA), and Rest of the World (RoW).

growth is almost unchanged (10.76 p.p.), which represents 171.1%. When annual changes in exports are approximated using a Törnqvist index (column 4), we obtain a growth rate of 180.9%. In the following, we will compute the contributions of sectoral, geographic and performance effects to this 180.9% increase.

Columns (5) to (7) of Table 4 show our decomposition of changes in market shares computed using the Törnqvist index for all products taken as a whole over the entire period (1995-2009). The 7% loss of world market share by the EU25 solely results from the negative performance effect, since the geographic and sectoral structures both contributed positively to the growth of European exports. Disentangling “old” and “new” EU Member States points to the positive contribution of the latter to the overall European export performance. More generally, the individual performances of member states are very different: the Irish performance, as well as the performance of most new member states, is striking and contrasts with the difficulty faced by the UK, France, Denmark, Belgium-Luxembourg, and Sweden. Of the EU15, only Greece, Portugal, Italy, and Spain suffer from a poor sectoral specialization (Table 10 in the Appendix). Lastly, the euro area performs slightly better than the EU27, which implies bad export performances for European countries not using the euro (UK shows the largest losses with almost 30% between 1995 and 2007).

However, the magnitude of EU losses (even EU15 ones) is much more limited than those recorded by Japan and the US. Structural effects contribute positively to American market shares growth but negative performance effects are stronger. Japanese losses in market shares are particularly strong (notably in the sub-period 2001-2009), with only the sectoral specialization contributing positively. All in all, EU performance remains satisfactory given the pressure of new competitors: China, but also India, Mexico or Indonesia, show impressive export performances, although negative structural contributions in general. This resilience of EU market shares is largely due to the German resilience and, to a lesser extent, to new member states performances as is shown in Table10, which details the results for individual EU27 countries.<sup>27</sup> Moreover, EU losses are less important in volume terms (Table 11 in the

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<sup>27</sup>The CMS analysis from Crespo & Fontoura (2010), which uses a panel similar to ours, also provides evidence of the growth of market share of many emerging countries in Asia and Central and Eastern Europe, despite their negative sector and /or geographical structure effects. As confirmed by Beltramello et al. (2012) using our methodology and data, the sectoral effect is negative for most emerging exporters, reflecting their specialization toward more traditional, lower technology industries.

Appendix), indicating a negative price effect, in particular for Germany and France.

As noted above, since the great trade collapse was synchronised among exporters, aggregate figures do not change the trend observed since 1995: advanced exporters continue to lose their market shares to the benefit of emerging ones, during and after the crisis. However, France and Switzerland have better performances when these two last years are included in the sample, mostly due to changes in sectoral demand, affecting positively their sectoral effect. Inversely, Japan, the US and Canada increase their losses in the last two years, combining worse performance and less favorable sectoral effect. Estimated HS2 fixed-effects indeed significantly change year by year: in particular, considering the period 1995-2009 or excluding the years 2008 and 2009, as shown in Figure 3 in the Appendix, does not give the same average effects.

### 3.3 A focus on high-tech and top range products

We now consider the changes in world market shares for high-tech products and top range products. As in Section 2.3, the two dimensions are considered separately. High-tech products are defined at the most detailed level of the product classification, regardless of their market positioning in terms of unit values. Besides, we ranked individual countries exports in three price segments of the world market, considering *all* products, whatever their technological level, and relying on unit values of trade flows. The decomposition is still performed at the HS2 level.

Regarding high-tech products, results are reported in Table 5. We observe a 12.6% increase in EU's world market share. This increase is the result from favourable sectoral positioning of European exporters, dampened by their disappointing performance on dynamic foreign markets.<sup>28</sup> In contrast, US and Japan lose within the decade about half of their 1995 market shares, due to a massive relocation of their assembly lines in Asia, in particular in China. Market share losses of developed countries are compensated by large gains recorded by many developing countries. China, Brazil and India stand out with the best performances, by multiplying their initial market shares by four, more than three and respectively more

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<sup>28</sup>The performance of the EU25 on high-tech products is considerably better than that of the EU15. New member states combine positive structure effects with a strong performance effect.

Table 5: Shift-share decomposition of the percent changes in world market shares, 1995-2009: **technological products**

	% $\Delta$ in market share using eq. (7)	Contribution of:		
		Export Performance	Structure effects	
			Geographic	Sectoral
EU27	12.6	-20.3	2.7	37.5
France	-0.3	-41.1	10.2	53.7
Germany	27.2	-5.9	2.8	31.5
Italy	-2.5	-33.6	1.6	44.6
United Kingdom	-35.9	-52.7	-5.6	43.4
Euro Area	17.3	-18.5	3.5	39.2
USA	-43.5	-52.9	4.3	14.9
Japan	-63.3	-63.5	8.3	-7.1
Canada	-26.9	-18.8	-26.7	22.7
Switzerland	23.3	-38.8	-5.0	112.0
China	353.5	623.5	-16.0	-25.4
Brazil	212.9	188.9	-10.6	21.2
India	361.3	154.8	13.2	59.9
Indonesia	72.2	151.8	-12.5	-21.8
Korea	25.4	34.7	9.7	-15.1
Malaysia	-12.8	27.2	-9.5	-24.3
Mexico	51.9	151.6	-30.4	-13.2
Taiwan	26.0	21.9	21.1	-14.6
Singapore	-49.5	-45.0	11.4	-17.6
Thailand	7.8	55.7	-7.4	-25.2
MENA	60.8	38.1	-1.3	17.9
SSA	-18.0	-21.9	-15.6	24.5
RoW	89.5	85.7	2.0	0.1

Source: Authors' calculations using all trade flows existing in any two consecutive years in the considered period, except flows associated with HS sections 25, 26, 27, 97, 98, 99, tiny values (below USD 10,000), non-independent territories and micro-states. The estimation is performed at the 2-digit level of the HS. All figures are expressed in terms of percentage change in market share. The four columns correspond to  $g_i \cdot 100$ ,  $(PERF_i - 1) \cdot 100$ ,  $(GEO_i - 1) \cdot 100$  and respectively  $(SECT_i - 1) \cdot 100$  from equation (7). Results for countries accounting for less than 1% of world exports from 1995 to 2009 are aggregated under three groups: Middle East and North Africa (MENA), Sub-Saharan Africa (SSA), and Rest of the World (RoW).

than two.

The decomposition of changes by market segment, raises an additional data issue. In order to fully capture year on year changes in market shares for a given exporter, one must take into account the fact that some flows may be classified in two different market segments depending on the year. Would the computation of the growth rates be performed on flows classified at both dates in the same market segment, these shifters would not be present. To bypass this problem, we adopted the following strategy. For each triple (exporter, importer, HS6) and year we classify:<sup>29</sup> As middle range products, flows present in the top range in  $t_1$  but not in  $t_0$ ; as middle range products, flows present in the top range in  $t_0$  but not in  $t_1$ ; other shifters as bottom range products.

We now shift to Table 6, focusing on the upper segment of the world market. For the EU, the positive market share growth for up-market products (+7%) contrasts with the global result (-5.4% in Table 4) and suggests a shift-up of the unit values of European exports. This is mostly due to the sectoral structure: the EU has benefited from a composition effect, whereby world demand has increased faster for its most exported up-market products. But the European export performance is also less negative (it is even positive for the Euro area), whereas is still very negative for Japan and the US. Here again the difference with the new Member states is striking, even if these percentage changes apply to tiny market shares. Contrasting with the EU and the US, Japan has benefited from a favourable geographical orientation of their exports of up-market products, thanks to a larger orientation toward a fast growing Asian market.

## 4 Conclusion

In a context of profound reshaping of world trade flows since the mid-1990s, we observe that the redistribution of market shares observed between emerging and developed countries – and among developing countries themselves – has differently affected the EU, Japan and the US. EU managed to maintain its world market share at 19.4% for goods (excluding energy and intra-EU trade) losing only 1.3 percentage points over the period (1995-2009). Market

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<sup>29</sup>Non-shifters (e.g. top range in  $t_0$  and  $t_1$ ) are kept in their initial range indeed.

Table 6: Shift-share decomposition of the percent changes in world market shares, 1995-2009:  
**up-market products**

	% $\Delta$ in market share using eq. (7)	Contribution of:		
		Export Performance	Structure effects	
			Geographic	Sectoral
EU27	7.0	-1.3	-0.4	8.9
France	-1.4	-14.6	2.0	13.3
Germany	7.3	2.6	3.5	1.1
Italy	-5.0	13.5	4.3	-19.7
United Kingdom	-19.6	-32.8	-0.9	20.6
Euro Area	10.5	3.8	-0.9	7.3
USA	-26.4	-28.8	-6.0	10.1
Japan	-25.7	-32.2	14.6	-4.4
Canada	-50.4	-41.0	-15.0	-1.0
Switzerland	-6.4	-29.0	0.2	31.6
China	187.5	436.7	-23.4	-30.1
Brazil	27.1	44.1	-14.8	3.5
India	40.8	61.2	-0.2	-12.5
Indonesia	-10.3	37.5	-6.0	-30.6
Korea	6.1	26.9	3.6	-19.3
Malaysia	-20.3	1.7	-5.8	-16.8
Mexico	44.6	61.5	-8.6	-2.0
Taiwan	-6.2	0.6	21.5	-23.3
Singapore	-37.8	-50.7	19.8	5.4
Thailand	-12.5	25.1	-9.3	-22.8
MENA	50.8	69.9	9.2	-18.7
SSA	25.2	41.4	-7.4	-4.4
RoW	19.9	25.1	4.1	-8.0

Source: Authors' calculations using all trade flows existing in any two consecutive years in the considered period, except flows associated with HS sections 25, 26, 27, 97, 98, 99, tiny values (below USD 10,000), non-independent territories and micro-states. The estimation is performed at the 2-digit level of the HS. All figures are expressed in terms of percentage change in market share. The four columns correspond to  $g_i \cdot 100$ ,  $(PERF_i - 1) \cdot 100$ ,  $(GEO_i - 1) \cdot 100$  and respectively  $(SECT_i - 1) \cdot 100$  from equation (7). Results for countries accounting for less than 1% of world exports from 1995 to 2009 are aggregated under three groups: Middle East and North Africa (MENA), Sub-Saharan Africa (SSA), and Rest of the World (RoW).

share losses are considerably more important in the case of the United States and Japan with around 6 percentage points decline. The US and Japan now account for 12.5%, and respectively 8.0% of world market shares.

Our analysis of the intensive and extensive change in the value of world trade shows that although the exports of new products and/or to previously unexploited markets account for a large share of the total number of flows both in 1995 and 2009, they represent only 17% of the increase in global trade in value. The contribution of the intensive margin to the growth of the value of exports of all developed countries is large, pointing to a relative inertia in the orientation of European, American and Japanese exports.

Our shift-share analysis of exports growth shows that European losses recorded between 1995 and 2009 are exclusively attributable to a negative contribution of the performance for European exporters. On the contrary, the geographic and sectoral structure of EU exports contributed positively to the exports growth. Focusing on EU15 reinforces this conclusion. Sectoral effects are in generally positive for OECD countries and geographical effects are negative for countries in the Americas or some in Asia.

Regarding high-tech and up-market products, the EU increases its world market share. Such better positioning of the EU25 among developed countries is due not only to a superior relative export performance, but also to a more pronounced specialization in products with highly growing import demand.

This paper has two contributions. From a methodological point of view, our findings illustrate the advantage of working at the most detailed level of the classification of products when it comes to defining market segments. These results also illustrate the pros of a shift share analysis applied to the intensive margin of country exports. From a policy perspective, our results indicate that the EU has better resisted the competition of emerging big traders, thanks to a buoyant world demand for top range products its exporters were specialised in.

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## 5 Appendix

### 5.1 Data description

Trade data used in this paper are from the BACI database, a database for the analysis of international trade at the product-level developed by Gaulier & Zignago (2010). BACI draws on the UN COMTRADE information, in which imports are reported CIF (cost, insurance and freight) and the exports FOB (free on board). BACI provides reconciled FOB data on trade flows: for a given product  $k$  and a given year  $t$ , exports from country  $i$  to importer  $j$  are equal to  $j$  imports from  $i$ . This reconciliation of mirror flows is done for both values and quantities, and relies on estimated indicators of the reliability of import and export country reports. The quantity units are converted into tons, making possible the computation of homogeneous unit values.<sup>30</sup>

BACI covers trade between more than 200 countries, in about the 5,000 products of the 6-digits Harmonised System (HS6) classification. However, this study excludes intra-EU 27 trade flows. This choice must be kept in mind when it comes to market shares and changes therein. We exclude also mineral products, specific, and non-classified products.<sup>31</sup> Trade flows inferior to USD 10,000 and involving non-independent territories and micro-states are also excluded in panel (2) of section 2.1 tables and in section 3. For the shift-share analysis in section 3 we employ HS2 data obtained by aggregation of HS6 data. The motivation behind is to keep a larger share of trade flows in the intensive margin, the only component of the exports growth discussed in that section.

Concerning the high-tech products, we use the classification in broad sectors proposed by Lall (2000), detailed in Table 7.

The availability of exchanged unit values at a very disaggregated level (country-partner-product-year) in the BACI database permits to compute international trade price indices. Similar to Gaulier et al. (2008) we compute price indices as chained Tornqvist indices of unit values, but unlike them we compute an index for each couple of trading countries (exporter-

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<sup>30</sup>BACI is available to COMTRADE users at: <http://www.cepii.fr/anglaisgraph/bdd/baci.htm>

<sup>31</sup>More precisely, we exclude the six following chapters of the Harmonized System: the mineral products (chapters 25, 26 and 27), the works of art, collectors' pieces and antiques (chapter 97) and the two last chapters, 98 and 99, dedicated to special classifications or transactions.

importer) and HS2 heading. Data in 2000 is taken as reference. We use these indices to deflate trade values (expressed in current USD in BACI) to obtain trade volumes expressed in terms of 2000 prices. Since this exercise permits to unravel price effects, we refer to obtained data as volumes.

Table 7: The classification of sectors according to the technological content, Lall (2000)

<b>Classification</b>	<b>Examples</b>
PRIMARY PRODUCTS (PP)	fresh fruit, meal, rice, cocoa, tea, coffee, wood
MANUFACTURED PRODUCTS	
RESOURCE BASED MANUFACTURES (RB)	
Agro/forest based products	Prepared meats/fruits, beverages, wood products, vegetable oils
Other resource based products	Ore concentrates, petroleum/rubber products, cement, cut gems, glass
LOW TECHNOLOGY MANUFACTURES (LT)	
Textile/fashion cluster	Textile fabrics, clothing, headgear, footwear, leather manufactures, travel goods
Other low technology	Pottery, simple metal parts/structures, furniture, jewellery, toys, plastic products
MEDIUM TECHNOLOGY MANUFACTURES (MT)	
Automotive products	Passenger vehicles and parts, commercial vehicles, motorcycles and parts
Medium technology process industries	Synthetic fibres, chemicals and paints, fertilisers, plastics, iron, pipes/tubes
Medium technology engineering industries	Engines, motors, industrial machinery, pumps, switchgear, ships, watches
HIGH TECHNOLOGY MANUFACTURES (HT)	
Electronics and electrical products	Office/data processing/telecommunications equip, TVs, transistors, turbines, power generating equipment
Other high technology	Pharmaceuticals, aerospace, optical/measuring instruments, cameras
OTHER TRANSACTIONS (OT)	Electricity, cinema film, printed matter, 'special' transactions, gold, art, coins, pets

Source: Lall (2000).

The world distribution of unit values for each HS6 heading allows us to classify each product-bilateral flow into three price segments, and examine competition among main world exporters within each of these segments. Trade flows are ordered according their unit values and classified as follows: flows with the lowest unit value form the *low-market*, the ones with intermediate unit values - the *mid-market*, and the ones with the highest unit value - the *up-market*. We employ the technique developed by Fontagné et al. (2008) to construct the three market segments. There is also a small “non classified” range of trade flows for which

data on trade quantities is not available and unit values can not be computed, but they represent less than 10% of the world trade.

Tables of this paper display results for countries accounting for more than 1% of world exports from 1995 to 2009. Results for all other countries in the world are available in our online appendix.<sup>32</sup>

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<sup>32</sup>Zipped file at Soledad Zignago's Banque de France webpage and Lionel Fontagné's personal webpage.

## 5.2 Additional results

Table 8: Extensive and intensive margins in 1995-2009 world exports by country, %

	(1) All trade flows			(2) Our (reduced) sample		
	Intensive Margin	Extensive Margin		Intensive Margin	Extensive Margin	
		+	-		+	-
	(a)	(b) (Entries)	(c) (Exits)	(d)	(e) (Entries)	(f) (Exits)
EU27	97,2	3,6	0,8	99,0	6,5	5,6
France	97,7	3,1	0,8	99,6	3,3	2,9
Germany	99,7	0,5	0,3	99,7	1,4	1,1
Italy	96,3	4,0	0,2	99,2	3,3	2,5
United Kingdom	99,6	1,1	0,7	99,3	5,0	4,3
Euro Area 12	98,2	2,4	0,6	99,7	4,0	3,7
USA	98,9	1,2	0,1	99,8	1,1	0,9
Japan	99,7	0,7	0,4	100,0	1,8	1,8
Canada	97,2	3,1	0,3	99,2	4,6	3,7
Switzerland	99,0	1,4	0,4	99,9	2,3	2,2
China	99,3	0,8	0,0	99,9	0,3	0,3
Brazil	90,1	10,3	0,4	95,3	10,3	5,6
India	97,1	3,0	0,1	98,8	3,2	1,9
Indonesia	96,6	3,8	0,4	99,0	5,2	4,2
Korea	93,8	6,3	0,1	99,5	3,0	2,5
Malaysia	97,4	2,8	0,2	98,4	3,9	2,3
Mexico	99,4	1,0	0,4	99,5	2,9	2,4
Taiwan	92,4	8,2	0,6	96,2	10,0	6,2
Singapore	96,7	3,8	0,6	100,8	6,0	6,8
Thailand	98,4	1,9	0,3	99,6	2,1	1,6
MENA	86,3	16,0	2,3	107,5	39,2	46,6
SSA	76,3	30,0	6,3	92,8	59,8	52,5
RoW	69,7	32,2	1,9	88,9	26,3	15,2

Note: Authors' calculations using BACI values (current USD) of exchanged goods at the HS 2-digit level. The samples used in panels (1) and (2) are those of Table 1. Column (a) refers to the contribution of export flows (product  $\times$  destination market) present both in 1995 and 2009. Column (d) refers to the contribution of export flows (product  $\times$  destination market) present in any two consecutive years from 1995 to 2009. The other columns refer to the contribution of export flows appearing (positive contribution) or disappearing (resp. negative) over the period. Columns sum as follows:  $(a) + (b) - (c) = 100$  and  $(d) + (e) - (f) = 100$ . Results for countries accounting for less than 1% of world exports from 1995 to 2009 are aggregated under three groups: Middle East and North Africa (MENA), Sub-Saharan Africa (SSA), and Rest of the World (RoW).

Table 9: Sectoral composition of world and EU exports in 2009 and changes 1995-2009

Sector (ISIC Rev.3)	2009 values, %		95-09, p.p. $\Delta$				
	World	EU	World		EU		
			values	volumes	values	volumes	
1	Agriculture, hunting	3.4	1.5	-0.43	-0.63	-0.07	-0.05
2	Forestry, logging	0.2	0.1	-0.18	-0.16	-0.05	-0.05
5	Fishing & fish farming	0.2	0.1	-0.10	-0.09	0.00	-0.01
14	Other mining & quarrying	0.3	0.6	-0.21	0.06	-0.57	-0.08
15	Food products & beverages	6.0	5.5	-0.07	-0.45	-1.26	-1.71
16	Tobacco products	0.1	0.2	-0.20	-0.40	-0.11	-0.07
17	Textiles	2.9	1.5	-0.90	-0.47	-1.37	-1.21
18	Wearing apparel	2.6	1.1	-0.51	-0.77	-0.62	-0.86
19	Leather	1.3	1.0	-0.35	-0.66	-0.69	-0.96
20	Wood & wood products	0.8	0.8	-0.58	-0.58	0.04	0.13
21	Pulp, paper & paper products	1.5	1.9	-0.84	-0.39	-0.49	-0.10
22	Publishing & printing	0.6	0.8	-0.23	-0.23	-0.34	-0.39
24	Chemicals & chemical products	13.3	19.6	2.84	2.01	5.20	3.24
25	Rubber & plastic	2.8	2.4	0.30	0.41	0.17	0.22
26	Non-metallic mineral products	1.1	1.4	-0.05	0.05	-0.66	-0.64
27	Basic metals	8.5	5.7	1.34	-0.35	-0.17	-1.31
28	Metal products	2.6	3.0	0.33	-0.11	0.22	-0.35
29	Machinery	11.3	17.6	0.46	0.18	-0.32	-2.13
30	Office machinery & computers	4.1	1.5	-2.21	-1.64	-1.12	-1.34
31	Electrical machinery	4.9	5.5	0.33	0.49	1.00	0.58
32	Radio, TV & communication equip.	10.9	4.1	0.56	1.74	-0.88	-2.22
33	Medical, precision & optical instr.	4.6	5.0	0.96	1.83	1.30	1.47
34	Motor vehicles, trailers & semi-trailers	7.1	9.1	-1.73	-1.88	-0.14	1.14
35	Other transport equipment	5.0	6.8	1.09	1.81	1.64	7.25
36	Furniture manufacturing n.e.c.	3.8	2.7	0.34	0.23	-0.86	-0.64

Source: Authors' calculations using BACI values (current USD) of exchanged goods (intra-EU trade is excluded). The change in market shares is given in percentage points (p.p.). Since oil is excluded of the sample, Coke, refined petroleum products & nuclear fuel remaining industry is not reported here. The sum of reported market shares is precisely 98 and 97% for the world and for the EU respectively.

Table 10: Shift-share decomposition of the percent changes in world market shares, 1995-2009: **EU 27 member states**

	% $\Delta$	Contribution of:		
	in market share using eq. (7)	Export	Structure effects	
		Performance	Geographic	Sectoral
<b>EU27</b>	<b>-5,4</b>	<b>-19,7</b>	<b>7,4</b>	<b>9,7</b>
Austria	19,4	3,3	8,1	6,9
Belgium and Luxembourg	-12,7	-36,8	15,2	19,9
Bulgaria	-35,8	-45,2	25,2	-6,4
Cyprus	-20,0	-48,1	38,1	11,7
Czech Republic	142,5	102,8	24,4	-3,9
Denmark	-11,8	-21,8	-0,9	13,7
Estonia	172,6	160,2	18,5	-11,6
Finland	-15,4	-26,8	15,6	0,0
France	-13,2	-32,5	10,0	16,8
Germany	-1,1	-15,5	6,2	10,1
Greece	22,5	12,0	35,5	-19,2
Hungary	148,1	98,3	23,9	1,0
Ireland	96,5	69,6	-20,7	46,1
Italy	-15,0	-19,0	11,7	-6,0
Latvia	10,5	-4,7	31,7	-12,0
Lithuania	25,0	-6,7	44,9	-7,6
Malta	71,5	58,7	-1,0	9,1
Netherlands	-10,4	-26,2	9,7	10,7
Poland	145,6	104,1	25,9	-4,4
Portugal	4,1	8,0	13,8	-15,3
Romania	63,2	29,5	38,9	-9,2
Slovakia	441,9	437,7	10,6	-8,9
Slovenia	21,2	-22,5	43,3	9,1
Spain	15,7	5,3	12,3	-2,1
Sweden	-23,7	-33,0	3,1	10,5
United Kingdom	-34,7	-45,4	1,4	17,8

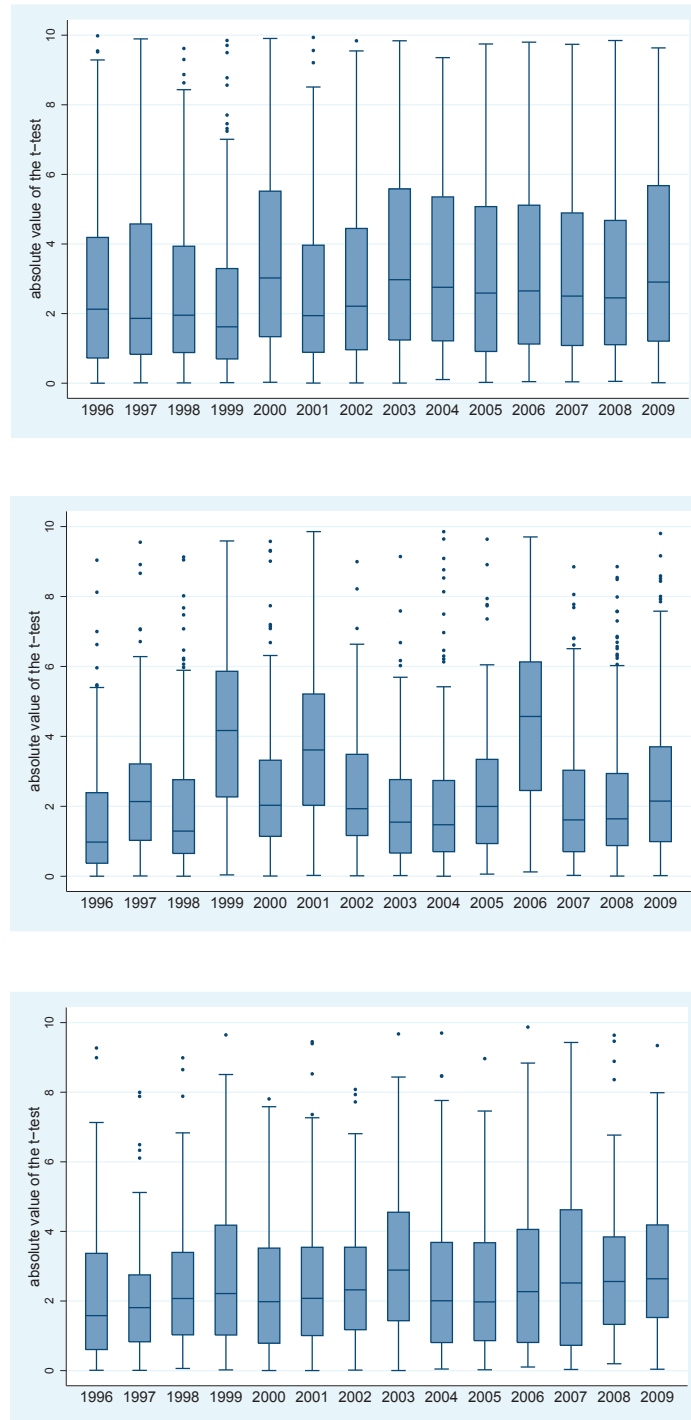
Source: Authors' calculations using all trade flows existing in any two consecutive years in the considered period, except flows associated with HS sections 25, 26, 27, 97, 98, 99, tiny values (below USD 10,000), non-independent territories and micro-states. The estimation is performed at the 2-digit level of the HS. All figures are expressed in terms of percentage change in market share. The four columns correspond to  $g_i \cdot 100$ ,  $(PERF_i - 1) \cdot 100$ ,  $(GEO_i - 1) \cdot 100$  and respectively  $(SECT_i - 1) \cdot 100$  from equation (7).

Table 11: Shift-share decomposition of the percent changes in world market shares, *all products*, 1995-2009: **in volume terms**

	% $\Delta$ in market share using eq. (7)	Contribution of:		
		Export Performance	Structure effects	
			Geographic	Sectoral
EU27	-2,5	-11,8	0,8	9,7
France	34,0	4,1	2,6	25,5
Germany	9,2	-2,8	1,6	10,5
Italy	-25,8	-23,0	3,6	-6,9
United Kingdom	-40,7	-44,9	-4,7	12,9
Euro Area 12	5,1	-5,6	1,5	9,8
USA	-33,3	-45,0	7,4	12,9
Japan	-40,6	-46,6	2,4	8,7
Canada	-50,6	-40,5	-21,9	6,5
Switzerland	-19,5	-36,6	2,1	24,3
China	160,4	307,8	-16,6	-23,5
Brazil	15,1	31,3	-0,8	-11,7
India	71,3	135,3	1,5	-28,3
Indonesia	14,1	54,5	-5,6	-21,8
Korea	42,6	31,1	10,1	-1,2
Malaysia	-15,7	-14,4	-2,9	1,4
Mexico	34,8	76,8	-22,5	-1,7
Taiwan	32,5	-6,2	39,2	1,5
Singapore	-16,7	-30,8	9,6	9,8
Thailand	12,9	28,3	-3,4	-9,0
MENA	39,8	53,8	8,0	-15,8
SSA	-7,4	12,0	-0,5	-16,9
RoW	1,4	20,7	1,9	-17,5

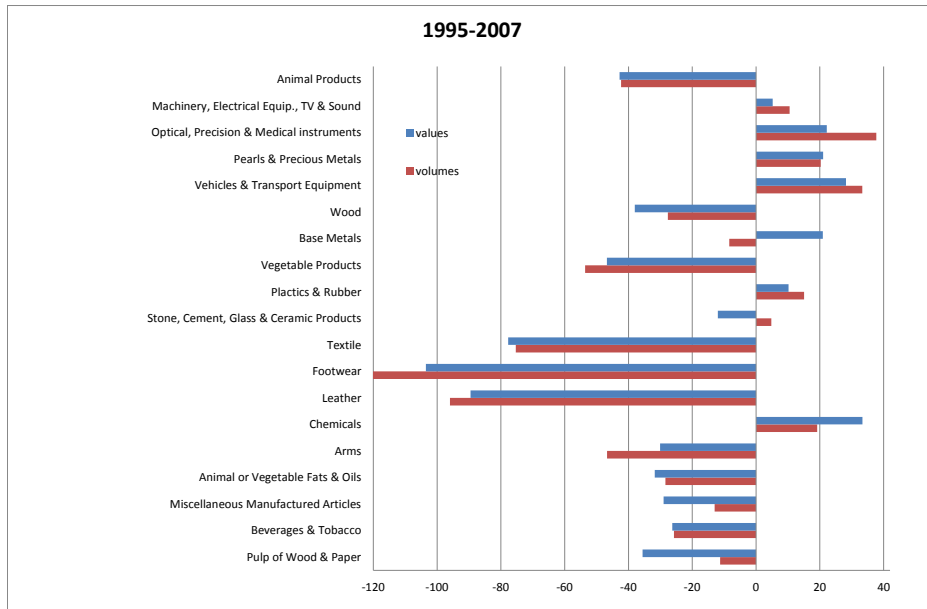
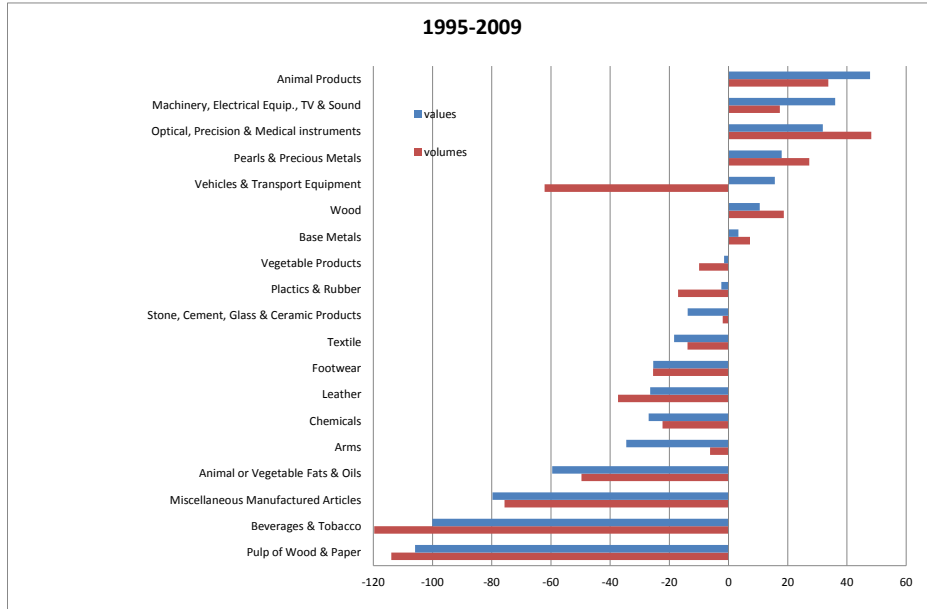
Source: Authors' calculations using all trade flows existing in any two consecutive years in the considered period, except flows associated with HS sections 25, 26, 27, 97, 98, 99, tiny values (below USD 10,000), non-independent territories and micro-states. The estimation is performed at the 2-digit level of the HS. All figures are expressed in terms of percentage change in market share. The four columns correspond to  $g_i \cdot 100$ ,  $(PERF_i - 1) \cdot 100$ ,  $(GEO_i - 1) \cdot 100$  and respectively  $(SECT_i - 1) \cdot 100$  from equation (7). Results for countries accounting for less than 1% of world exports from 1995 to 2009 are aggregated under three groups: Middle East and North Africa (MENA), Sub-Saharan Africa (SSA), and Rest of the World (RoW).

Figure 2: Standard errors of exporter, importer and product fixed effects, central values



Source: Authors' calculations using all trade flows existing in any two consecutive years in the period 1995-2009, except flows associated with HS sections 25, 26, 27, 97, 98, 99, tiny values (below USD 10,000), non-independent territories and micro-states. The estimation is performed at the 2-digit level of the HS.

Figure 3: Estimated HS2 fixed effects, 1995-2009 and 1995-2007 periods, values and volumes, by HS sections



Source: Authors' calculations using all trade flows existing in any two consecutive years in the period 1995-2009, except flows associated with HS sections 25, 26, 27, 97, 98, 99, tiny values (below USD 10,000), non-independent territories and micro-states. The estimation is performed at the 2-digit level of the HS.

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