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European Export Performance

Angela Cheptea
Lionel Fontagné
Soledad Zignago

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EUROPEAN EXPORT PERFORMANCE

NON-TECHNICAL SUMMARY

Until the collapse of international trade in goods during the last quarter of 2008 and the first quarter of 2009, trade in merchandise has been driven by the exports and imports of emerging countries during more than a decade. These countries gained market shares in the manufactured goods market from industrialised countries. To study the way in which the European Union coped with this reinforced competition, we present an analysis of EU export performance against that of other main world exporters from 1994 to 2007.

This analysis is performed at a highly disaggregated product level. The recent theoretical and empirical literature in international trade which aimed at a renewed understanding of specialisation and competition, in particular between the North and the South, has shown that countries specialise indeed not in products or sectors, but in varieties of the same product (exported at different prices). Harmonised unit values from the BACI database of CEPII permit us to differentiate three price ranges for bilateral trade flows in some 5,000 products (in the 6-digit Harmonised System).

At this level of detail, the growth of world exports comes mainly from the increase in the value of existing flows (intensive margin) rather than the emergence of new trade flows (extensive margin). This is the case not only for large developed exporters, but also for China. In order to distinguish the exports performance of each country from the positions it acquired on different markets, we decompose the intensive margin of trade into three terms: a geographic structure effect, a sectoral structure effect, and a performance effect.

We find that from 1994 to 2007 the EU25 withstood the competition of emerging countries better than the US and Japan. The loss of world market shares by EU25 in all products together is explained mostly by poor performance effects, and fall mostly on old member states during the 1994-2000 period. From 2000 to 2007 EU25 manages to gain market shares acquired on the upper price range of the market, where the EU cumulates good performance and favourable structure effects, while the US and Japan withdraw extensively from this segment of the market. Finally, all developed countries lose market shares in high-technology products to developing countries, with the EU losing less than other countries.

ABSTRACT

Countries no longer specialise in products or sectors, but in varieties of the same product (sold at different prices). To study the way in which the European Union copes with the emergence of new big world exporters in this context, we analyse the redistribution of world market shares at the level of product variety. To define these varieties we distinguish for each product three price ranges. We decompose the growth of exports into structural effects (geographic and sectoral) and into a pure performance effect. From 1994 to 2007 the EU25 withstood the competition of emerging countries better than the US and Japan. European market share losses arise during the 1994-2000 period, and fall mostly on old member states. More precisely, the EU gains market shares in the upper price range of the market, by cumulating good performance and favourable structure effects, contrary to the US and Japan which withdraw extensively from this segment of the market. Finally, all developed countries lose market shares in high-technology products to developing countries, with the EU losing less than other countries.

JEL Classification: F12, F15

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

PERFORMANCES À L'EXPORTATION DE L'UNION EUROPÉENNE

RÉSUME NON TECHNIQUE

Jusqu'à l'écroulement du commerce international durant le dernier trimestre 2008 et le premier trimestre 2009, les échanges internationaux de biens ont été entraînés pendant plus d'une décennie par les exportations et importations des pays émergents. Ces pays ont gagné des parts sur les marchés de produits manufacturés, au détriment des pays industrialisés. Pour étudier la manière dont l'UE a fait face à cette concurrence renforcée, nous proposons ici une analyse de ses performances à l'exportation comparativement à celles des autres grands exportateurs mondiaux de 1994 à 2007.

Cette analyse est menée à un niveau fin de détail par produits. La littérature théorique et empirique récente en commerce international, qui a débouché sur une compréhension rénovée des spécialisations et de la concurrence, notamment entre Nord et Sud, a montré, en effet, que la spécialisation ne se fait plus au niveau des produits ou, *a fortiori*, des secteurs, mais au niveau des variétés d'un même produit (vendues à des prix différents). Les valeurs unitaires harmonisées de la base de données BACI du CEPII nous permettent de distinguer trois gammes de prix pour les flux bilatéraux d'échanges de quelque 5 000 produits (Système Harmonisé à six chiffres).

A ce niveau de détail, c'est l'accroissement en valeur des flux existants (marge intensive) et non pas l'apparition de nouveaux flux (marge extensive) qui explique l'essentiel de la croissance des exportations mondiales. C'est le cas non seulement pour les grands exportateurs développés mais aussi pour la Chine. Pour distinguer ce qui relève de la performance de chaque exportateur des positions qu'il a acquises sur les différents marchés, nous décomposons cette marge intensive en trois termes : un effet de structure géographique, un effet de structure sectoriel et un effet de performance.

Nous observons que, de 1994 à 2007, l'Union à 25 résiste mieux que les Etats-Unis et le Japon à la concurrence des émergents. La perte de parts de marché mondiales de l'UE-25, tous produits confondus, s'explique principalement par les effets de performance, notamment de la plupart des anciens pays membres et sur la période 1994-2000. De 2000 à 2007, l'UE-25 parvient à gagner des parts de marché, acquises sur le haut de gamme où l'UE cumule bonnes performances et effets structurels favorables, alors que les Etats-Unis et le Japon reculent largement sur ce segment de prix. Enfin, sur les produits de haute-technologie les pays développés perdent tous des parts de marché au profit des pays en développement, mais l'Europe parvient à en perdre moins que les autres.

RÉSUMÉ COURT

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 dans ce contexte renouvelé, nous analysons la redistribution mondiale des parts de marché au niveau des variétés en repérant pour chaque produit trois gammes de prix. Nous distinguons dans la croissance des exportations l'impact des effets structurels (géographique et sectoriel) et celui d'un pur effet de performance. De 1994 à 2007, l'Union à 25 résiste mieux que les Etats-Unis et le Japon à la concurrence des émergents. La perte de parts de marché de l'Union est concentrée sur la période 1994-2000 et s'explique par de mauvaises performances à l'exportation notamment de la plupart des anciens pays membres. Plus précisément, c'est sur le haut de gamme que l'UE gagne des parts de marché mondiales, cumulant bonnes performances et effets structurels favorables, contrairement aux Etats-Unis et au Japon qui en perdent largement sur ce segment de prix. Enfin, sur les produits de haute-technologie, les pays développés perdent tous des parts de marché au profit des pays en développement, mais l'Europe parvient à en perdre moins que les autres.

Classification JEL : F12, F15.

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

EUROPEAN EXPORT PERFORMANCE[1]

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1. INTRODUCTION

Emerging countries have been winning large market shares since the early 1990s. Among these, China stands out with the most remarkable performance: it almost tripled its world market share since 1994 reaching 16.1% in 2007. This evolution is striking for the most technological products, where some of the new competitors – if not all – have combined an increase in market share with a higher unit value of the exported products. Such outcome is at odds with the textbook illustration of the classical theory of international trade, whereby advanced economies should specialise in the technological or skilled intensive sectors, and the new competitors in low-tech or unskilled labour intensive sectors.

On one hand, we observe a diversification of the portfolio of products exported by emerging economies. Krugman (1989) argued that the propensity of fast growing emerging economies to diversify their bundle of exported products allowed them to increase their volume of exports without resorting to a real exchange rate depreciation.[2] Hummels & Klenow (2005) use a cross-section of detailed trade data to identify the patterns of exports of 110 countries in 1995, and ask whether large exporters ship more goods to more markets, or ship more of each good to each market. The answer is: two-thirds of more goods, one third of more of each good.

On the other hand, trade flows with persistently dissimilar prices can be observed within the most narrowly defined products. Advanced and emerging economies export rather similar bundles of goods (Schott, 2004, 2008). However, specialisation occurs inside these categories, on vertically differentiated varieties of products (Fontagné et al., 2008). Baldwin & Harrigan

[1]An earlier draft of this paper was prepared as a report for the European Commission (Contract No: SI2.484.560, "Underlying economic factors determining EU member states' trade policy"). The views are those of the authors. We thank Guillaume Gaulier and Julia Woerth for their useful comments. Usual disclaimer apply. This is the **August 2011 revised version** of this working paper.
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[2]The "extensive margin" of exports so defined should not be confounded with the heterogeneous firms settings *à la* Melitz (2003) 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 (Bernard et al., 2009).

(2007) introduce a theoretical framework in which competitiveness depends upon the quality-adjusted price. Accordingly, thresholds to enter a foreign market are defined in terms of quality-adjusted prices instead of prices alone. 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. However, there is even some evidence of quality sorting among Chinese firms (Manova & Zhang, 2009).

In light of these new findings, how can older industrialised countries, particularly EU member states, face up the competitive pressure of the emerging countries? This paper aims to answer this question by identifying recent changes in specialisation and market shares of the EU in comparison with those observed for the United States, Japan, and major emerging competitors. The three issues addressed here are (i) how specialisation on products of different quality has shaped the recent evolution of world market shares, (ii) how entries of new competitors are reflected in the margins of world exports at the most disaggregated level of the product classification, and (iii) which part of the observed changes in market shares is due to the composition effects and not to the exporter competitiveness.

To do so, it is necessary to rely on very detailed and longitudinal trade data, on an exhaustive basis, including information on unit values. To this end, we use 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, at the product level: 5,000 headings from the 6-digit Harmonised System (HS) classification, hereafter HS6.

Our value added is threefold. Firstly, we examine the change in market shares of leading world exporters over the period 1994-2007. Importantly, 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 (section 2).

Secondly, relying on information by product, market, exporter, and year, we compute the "extensive margin" of trade, which is defined either 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. The "intensive margin' of trade is symmetrically defined as the change in the value of trade flows that are present continuously throughout a given period (section 3). 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 the intensive margin.

Thirdly, an econometric *shift-share decomposition of export growth* identifies for each exporter the contributions to the intensive margin of trade: export composition (by product and destination) versus competitiveness. Accordingly, export growth for each country is broken down into three components: a geographic composition effect, a sectoral composition effect and a perfor-

mance effect (section 4). Countries have limited influence on the composition effects, which result from the growth of their markets, given the initial geographical and sectoral orientation of their exports. In contrast, the performance effect captures the degree to which the exporting country has been able to gain (or lose) market shares: this is the true competitiveness effect. Ultimately, this decomposition is performed separately for high-tech and top range products in terms of prices.

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 The overall EU's good performance in the period 1994-2007, compared to the United States or Japan, is associated with an original price-quality positioning of its products.

The rest of the paper is organised as follows. We review the redistribution of world market shares in Section 2, with a focus on high-tech and top range products. The impact of the emergence on trade margins is documented in Section 3. Our econometric shift share analysis of export growth is described in Section 4. Section 5 concludes.

2. The redistribution of world market shares between 1994 and 2007

The objective of this section is to take stock of the recent changes in EU world market shares, taking into account the price segment and technological content of exported products at the most detailed available level of the product classification. The EU is compared to other large exporters: the United States and Japan on the one hand, and Brazil, Russia, India, and China (thereafter BRICs) on the other.

Our database, BACI, provides reconciled values and unit values (values divided by quantities), at the HS6 level, since 1994.[3] 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. We exclude intra-EU trade flows to allow the comparison with other exporters.[4] The availability of unit values enables us to classify flows by range of price and thus to analyse the positioning of exporters by price segment. This is of utmost importance since such an approach authorises to tackle the specialisation of countries within products (Schott, 2004) on a systematic basis.[5]

2.1. EU market shares compared with US, Japan and BRICs

In Table 1, we summarise the recent shifts in world market shares as follows. The first three columns give the market share in 1994, 2000, and 2007. In the three subsequent columns, we

[3] See Gaulier & Zignago (2010) for the methodology of reconciliation.

[4] 67% of EU25 exports are shipped into the Single European Market, where most of European countries record larger market shares benefitting from a somehow better market access (Fontagné et al. (2005)).

[5] See Appendix **(Section 6.1)** for more details on data and classifications.

observe the percentage point changes in market shares for the whole period and for the two sub-periods (1994-2000 and 2000-2007). European figures (EU25) are detailed for two groups of countries: the 15 older members (EU15) and the 10 new member states (NMS10).

Table 1 – Changes in world market shares 1994-2007 for largest world exporters

	Market shares, %			Δ in market shares, p.p.		
Exporter	1994	2000	2007	94-07	94-00	00-07
EU25	**19.7**	**18.1**	**19.3**	**-0.34**	**-1.58**	**1.23**
EU15	19.1	17.5	18.0	-1.06	-1.62	0.56
New Member States	0.6	0.6	1.3	0.71	0.04	0.67
USA	18.5	18.3	12.5	-5.97	-0.23	-5.74
Japan	14.8	11.7	8.6	-6.23	-3.12	-3.11
China	5.8	8.0	16.1	10.26	2.17	8.09
India	1.0	1.1	1.7	0.61	0.09	0.51
Russia	0.9	1.3	1.5	0.62	0.37	0.25
Brazil	1.5	1.3	1.6	0.10	-0.27	0.37

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.).

The most remarkable evolution in Table 1 is that, in the sub-period 2000-2007, China has doubled its world market share becoming larger than the US as a super trader. In 1994, EU25 had a 19.7% market share in a world market excluding intra-EU trade. This market share has been only slightly affected by competitive pressures from emerging economies, down to 19.3% in 2007. Thus, the EU market share has been fairly affected by the ten-point rise of China over the same period. In contrast, Japan and the US lose around 6 percentage points of market shares each.

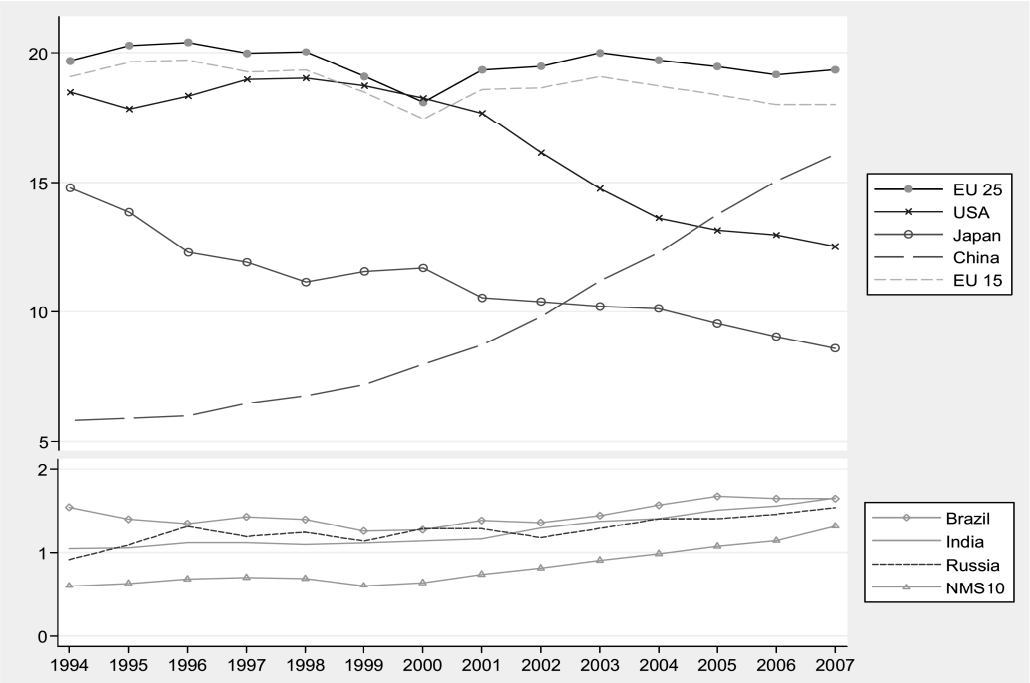
The EU's export performance was uneven, varying significantly between markets over the 1994-2007 period. The EU shows a decrease in market shares on some of the most dynamic importing markets during the last decade.[6] The largest gain is in the US market, where the EU accounted for over one fifth of the import market in 2007. This performance coincided with shrinking shares of Japanese exports in the same market (-10.5 p.p. over 1994-2007) and, to a lesser extent, of Canadian (-3.9 p.p.) and ASEAN (-1.6 p.p.) exports. Oppositely, the EU loses market shares on the Japanese and BRICs markets. The apparently small market share loss of EU products on the rapidly expanding Chinese market (-2.8 p.p.) can have 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

[6]Results not shown in the paper but available upon request.

Member States, with lower costs. The exception is Ireland: Table 10 in the Appendix shows that this member of our EU-15 group has been the most successful European exporter over the 1994-2007 period, doubling its world market share. Poland, Hungary, Belgium, Austria, and the Czech Republic also recorded large gains in market shares. On the contrary, the U.K., France, and Italy have experienced the greatest losses in their world market shares, followed by Denmark and Sweden.

Figure 1 – Evolution of world market shares, 1994-2007



Source: Authors' calculations using BACI values (current USD) of exchanged goods. We exclude oil and intra-EU trade. European market shares are given as a whole (EU25) and detailed into two groups: the 15 older members (EU15) and the 10 new member states (NMS10).

We now ask whether there has been a recent acceleration of the process of market share redistribution at the world level, and if so, how did the EU manage to cope with it. As a background, we recall the U-shaped evolution of the Euro-US dollar exchange rate throughout the period. In Figure 1 we plot the evolution of world market shares for selected exporters, also summarised in columns 1 to 3 of Table 1. 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 EU25 exports, with most of its previous losses recuperated. This trend is less the case when one considers the EU15 alone, underlining again the positive performances of the ten new member states. Still, much (69%) of the gains recorded by the EU during the second sub-period are due to Germany's excellent performance.

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.[7]

Changes in market shares vary also considerably across sectors. The EU performance is not uniform across products, as illustrated in Table 2. Among the most resilient sectors, the manufacture of wood, vehicles, tobacco, and paper stand out. The largest losses are recorded for the manufacture of non-metallic mineral products, basic metals, furniture, leather, and machinery.

Table 2 – EU25 world market shares in 2007 and changes 1994-2007, by sector

	Sector (ISIC Rev.3 2-digits classification)	2007, %	94-07, p.p. Δ
20	Wood & wood products	17.1	8.17
34	Motor vehicles, trailers & semi-trailers	24.8	5.55
16	Tobacco products	20.7	3.88
21	Pulp, paper & paper products	24.4	3.27
5	Fishing & fish farming	5.9	2.44
23	Coke, refined petroleum products & nuclear fuel	25.6	2.05
2	Forestry, logging	9.0	1.81
35	Other transport equipment	25.7	1.37
33	Medical, precision & optical instruments	21.0	0.74
31	Electrical machinery	20.4	0.53
1	Agriculture, hunting	8.3	0.37
25	Rubber & plastic	18.2	0.20
32	Radio, TV & communication equipment	8.7	-0.14
24	Chemicals & chemical products	27.9	-0.77
22	Publishing, printing & reproduction of recorded media	27.3	-0.87
30	Office machinery & computers	7.6	-0.96
28	Metal products	23.7	-1.26
18	Wearing apparel	8.4	-1.65
17	Textiles	12.3	-1.77
15	Food products & beverages	19.4	-2.42
29	Machinery	30.3	-3.08
19	Leather	14.9	-4.60
36	Furniture; manufacturing n.e.c.	14.8	-4.69
27	Basic metals	12.3	-5.80
26	Non-metallic mineral products	26.5	-8.25

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.). Sectors are sorted by decreasing percentage change.

[7]For instance, results not reported here show disappointing performances for Mexico and ASEAN countries since 2000.

2.2. 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. We now concentrate on these two dimensions of trade patterns.

Concerning high-tech products, we simply rely on the classification proposed by Lall (2000). Sectors are classified into primary products, resource-based manufactures, low, medium and high-technology manufactures, and other transactions. The high-tech category comprises electronics and electrical products, as well as pharmaceuticals, aerospace, optical and measuring instruments, cameras, etc. (see Table 9 in the Appendix for the sectors classified in the other categories).

Concerning top range products in terms of prices (here, unit values), the procedure deserves more explanation since the method we use 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 specialisation 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). Most 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.[8] 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 α, the higher the share of trade in the medium range (here we use $\alpha = 4$ to end up with similar size groups).[9] Overall, we decompose each bilateral value (X_{ijkt}) across an additional dimension s, corresponding to the market segment ($s = low, mid, up$).

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 2007, the second one their change in percentage points over the period 1994-2007. The EU is gaining market share in high-tech products: a 0.81 p.p. gain compared to a 0.34 p.p. for all products together (column 4 of Table

[8]Noting UV the unit values and V the trade values used as weights, the relative unit value is:

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

[9]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.

1). The United States and Japan, on the other hand, recorded losses twice as large as for all products (respectively 11 p.p. and 13 p.p., as shown in the second column of Table 3). In the meantime, Chinese gains are very large on the high-tech market (18 p.p.), due to a massive relocation of the assembly of these products to mainland China.

Table 3 – Change in world market shares for high-tech products and by market segment, 1994-2007

	High-tech products		Up-market		Mid-market		Low-market	
Exporter	2007 %	*94-07* p.p. Δ	2007 %	*94-07* p.p. Δ	2007 %	*94-07* p.p. Δ	2007 %	*94-07* p.p. Δ
EU 25	**16.9**	*0.81*	**28.8**	*0.83*	**16.8**	*-1.51*	**16.1**	*0.25*
EU 15	15.7	*-0.02*	27.5	*-0.16*	15.6	*-2.18*	14.6	*-0.24*
New Member States	1.2	*0.83*	1.3	*0.99*	1.2	*0.68*	1.5	*0.49*
USA	13.7	*-11.15*	13.5	*-6.00*	13.5	*-3.20*	10.5	*-5.39*
Japan	8.0	*-12.68*	9.8	*-9.76*	8.0	*-10.79*	8.5	*-1.34*
China	21.2	*17.79*	7.6	*5.94*	15.5	*11.37*	22.9	*10.67*
India	0.6	*0.39*	1.0	*0.52*	1.9	*1.00*	1.9	*0.50*
Russia	0.4	*0.14*	0.9	*0.59*	2.0	*0.90*	1.5	*0.22*
Brazil	0.6	*0.32*	0.9	*0.12*	2.1	*-0.20*	1.7	*-0.19*

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.).

Concerning now the market positioning of exported products, the remaining three pairs of columns in Table 3 give the world market shares in 2007, and their change in percentage points over the period 1994-2007 for each of the three market segments (low, middle, up). EU's leadership for up-market exports is ascertained. 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. Japan exhibit a quite similar pattern, while the US have the same market share in up- and mid-market products. However, both countries are losing ground in all ranges of products. Differently, the EU managed to slightly increase its market share in top range products. 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.

3. Extensive and intensive margins of world trade

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. Recent theoretical and empirical studies stress that the underlying economic

determinants and the outcomes (the gains from trade) of the two margins are quite different. In particular, the same shock (e.g. in terms of trade costs) may affect differently the two trade margins.

Our contribution to the literature is that we use the most detailed trade data compatible with an exhaustive set of exporters, over a decade.[10] Felbermayr & Kohler (2006), rely on the DOTs (IMF) data, which is total bilateral exports. Also, as compared to them, we use a properly reconciled database instead of proceeding with averages of CIF and FOB records for the same flow. The price to pay for this detail is a shorter time span. Differently from Hummels & Klenow (2005) and Haveman & Hummels (1997), we rely on a wide sample of countries, since we use the whole matrix of trade flows to compute market shares or unit values. [11]

3.1. At the world level

Let us firstly compute the number of *potential* trade flows. A simple calculation would compare the 2.3 million trade flows observed in 1994 (see Table 4, Panel 1) with a potential 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 50.9 million potential trade flows in 1994 and 79.8 million in 2007. Accordingly, only 4.5 percent of the potential trade flows were actually observed in 1994 and 5.9 percent in 2007. The change in the number of countries is not the explanation of such increase: what matters is the diversification of their exports (in terms of products).

Relying on the set of observed flows in Table 4 we compute the intensive and extensive change in the value of world trade between 1994 and 2007. In panel (1) of this Table we start by excluding mineral products, specific, and non-classified products.[12]. The observed USD 5,632 bn 1994-2007 increase in world trade (column C) can be decomposed into three components. Firstly, the 1,647,068 elementary bilateral trade flows existing in 1994 and still in place in 2007 (second line of Table 4) have increased their value by USD 4,880 bn. Accordingly, the intensive margin accounted for 86.7% of the change in the value of world trade (ratio of column D to column C). Secondly, 27.6% (626,920) of the number of flows have disappeared during

[10]Changes in the product classification used limit the time coverage of such exercise.

[11]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. Haveman and Hummels rely on 438 positions of 4-digit SITC data for 1990 and for 173 countries.

[12]We exclude HS chapters 25, 26, 27, 97, 98, and 99 all along this paper, as detailed in the Appendix

this period. This is the result of firms and countries ceasing trade to certain markets or to certain products. In 1994 these trade flows amounted to USD 149 bn. Lastly, 3,075,360 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 34.9% of the number of trade flows recorded in 2007 were present in 1994. The remaining 65.1% are new flows (column E) either in terms of destination, exported products, or both. Meanwhile, the contribution of new entries to the 1994-2007 growth of trade in value terms was of only 16.0%. Exits (column F) account for 27.6% of the number of 1994 flows but only for 5.4% 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 1994 and 2007, they represent less than one seventh (13.3%) of the increase in global trade in value.

Table 4 – Extensive and intensive margins in world trade, 1994-2007

	Unit	1994	2007	Δ	Intensive	Extensive		
		A	B	C= B-A (D+G)	D	E Entries	F Exits	G =E-F Net
(1) All flows,	USD bn	2,752	8,384	5,632	4,880	901	149	752
intra-EU excl.	nb flows, 1000	2,274	4,722		1,647	3,075	627	
(2) Our (reduced)	USD bn	2,737	8,333	5,596	4,743	1,028	175	853
sample	nb flows, 1000	1,401	2,426		943	1,483	458	

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-independant territories, micro-states and small flows (<10,000 USD). For each panel, we give figures in billion dollars and in thousands of HS6 bilateral flows.

These results must be qualified by performing some sensitivity tests. When we exclude non-independent territories and micro-states[13], the extensive margin (entries - exits) is 15.6%. Another important test is to exclude small flows (below USD 10,000) which account for a large share of the total number of individual bilateral trade flows but a very limited share of their value. Besides, these small flows are also excluded in the section 4.[14] When one combines these two corrections, we end up with panel (2) (two last rows of Table 4) with a contribution of the extensive margin of 15.2% (853/5,596), pointing to the robustness of our findings.

[13]Non-independent territories and certain small countries do not collect and report separately data on their foreign trade. We keep however Taiwan and Macau due to the large value of their trade.
[14]In this case the extensive margin (entries - exits) is 13.0%.

3.2. For large exporters

The contribution of the intensive and the extensive margin of exports for different countries is reported in Table 5. The contribution of the positive extensive margin (entry) to the growth of the value of exports is very similar for the developed economies (around 5% using panel (1) of Table 4). This points out the pronounced inertia in the orientation of EU, US, and Japanese exports. Their trade growth is mainly accounted for by expansion in existing markets (96.9%, 97.5%, and 101.9% respectively), while the negative extensive margin (exit) is largest in Japan (6.8%) and lowest in the EU (1.4%).

Table 5 – Extensive and intensive margins in 1994-2007 world exports by country, %

	(1) All trade flows			(2) Our (reduced) sample		
	Intensive Margin	Extensive Margin + (Entries)	Extensive Margin − (Exits)	Intensive Margin	Extensive Margin + (Entries)	Extensive Margin − (Exits)
	(a)	(b)	(c)	(d)	(e)	(f)
EU 25	**96.9**	**4.5**	**1.4**	**96.1**	**5.7**	**1.8**
EU 15	96.9	4.6	1.5	96.1	5.8	1.9
New Member States	75.2	28.4	3.6	65.2	39.0	4.3
USA	96.9	6.0	2.9	96.4	7.2	3.6
Japan	101.9	4.8	6.8	101.4	5.9	7.4
China	90.0	10.7	0.7	87.1	13.7	0.8
India	72.5	28.8	1.3	68.3	33.7	2.0
Russia	49.5	54.3	3.8	49.5	54.8	4.3
Brazil	74.4	30.2	4.6	70.8	34.5	5.4

Source: Authors' calculations using BACI values (current USD) of exchanged goods. The samples used in panels (1) and (2) are those of Table 4. Columns (a) and (d) refer to the contribution of export flows (product × destination market) present both in 1994 and 2007. 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 $(d) + (e) - (f) = 100$.

Unsurprisingly, emerging economies are characterised by a larger contribution of the positive extensive margin. It peaks at 69.1% for Ukraine, with high levels of 54.3% for Russia, 30.2% for Brazil, 28.8% for India, and 25.5% for Turkey.[15] The exceptions to this trend among developing countries are Mexico and China, which experienced 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 considered period. As for China, the results confirm the importance of the increased intensive margin, whereas the diversification of exports was already accomplished in 1994 (e.g., China is shipping

[15]Detailed results at the country level are reported only for our selection of large exporters in Table 5 and for all member states in Table 12 in the Appendix.

roughly as many different products as Germany is shipping to the US). Switching to panel (2) of Table 4 (our reduced sample above mentioned and used in the next section), there are no pronounced changes.

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? Table 12 in the Appendix shows that old member states increased their exports mainly along the already established trade relationships. The relative importance of the intensive margin goes from 47.2% for Greece to 93.3% for Germany. On the opposite, new members exports' growth is acquired mainly by developing new trade relationships.[16]. All new member states have a contribution of the positive extensive margin to the growth of their exports near or larger than 50%. It ranges from 48.2% for Hungary to 90.1% for Estonia. Among the fifteen old member states only Greece and Belgium exhibit such large figures. Since export baskets and destinations of the new EU members have been profoundly reshaped during the 1994-2007 period, the negative extensive margin is also large. Still, the contribution of the net extensive margin to the growth of exports remains large and positive for these countries: 87.7% for Estonia, 66.3% for Slovakia, 60.0% for Poland, etc. This is to be compared with 6.0% for Germany, for instance.

We now 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.

4. 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* technique, also known as constant market share analysis or structural decomposition. The shift-share decomposition identity was first proposed by Maddison (1952) and was extensively used afterwards. Although employed mainly in regional studies on economic and employment growth, this method has been successfully extended to trade issues. 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, a necessary to compute annual growth rates. Accordingly we stick to intensive margin of trade.

The definition of the intensive margin adopted here is more inclusive than the one used in the former section. We define the intensive margin as the increase in the value of flows existing *in any two consecutive years* from 1994 to 2007: growth computation is not restricted to flows

[16]We disregard results for Cyprus for which data is not significant.

present in 1994 and 2007. As in panel 2 of Table 4, we exclude flows below USD 10,000 and those concerning micro-states. The 3,639,317 flows that satisfy these conditions account for a trade growth of bn USD 5,463. This figure does not include trade flows created (bn USD 346) or disappeared (bn USD 213) throughout the period,[17] and is larger than the intensive margin of panel (2) in Table 4 (bn USD 4,743).

4.1. The shift-share methodology applied to the growth of exports

In the field of international trade, the traditional shift-share analysis aims to measure the contribution of countries' geographical and sectoral specialisation to the growth of their exports. Since shift-share 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 pure performance (*i.e.* competitiveness).

This method has been extensively used in competitiveness studies. Laursen (1999), Wörz (2003) or Alcántara Escolano & Blanes Cristóbal (2000) are some examples of papers using the structural decomposition to analyse export performances at the country level.[18]

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.[19] 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)

[17]Accordingly, we explain bn USD 5,463 of growth in world trade flows between 1994 and 2007 out of bn USD 5,596.

[18]The origin of the shift-share method in regional studies explains its more generalised application to sub-national level data. Markusen et al. (1991) use a shift-share decomposition and estimate the shares of employment growth for export and import penetration in nine US regions. Hayward & Erickson (1995) have extended this model, applying it to the North American Free Trade Area. Gazel & Schwer (1998) study the growth of international exports of the US states by focusing on demand conditions.

[19]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. There are three components when market shares are used.

weighted variance analysis of growth rates.[20] The aim of this method is ultimately to decompose the growth of each country's exports into three terms: a geographic structure effect, a sectoral effect, and an exporter-effect which represents also 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 stpe 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: $w^t_{ijk} = \frac{1}{2}\left(\frac{X^{t-1}_{ijk}}{X^{t-1}} + \frac{X^t_{ijk}}{X^t}\right)$ and $w^t_i = \frac{1}{2}\left(\frac{X^{t-1}_i}{X^{t-1}} + \frac{X^t_i}{X^t}\right)$. 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^t_{ijk}, OLS:

$$\ln\left(\frac{X^t_{ijk}}{X^{t-1}_{ijk}}\right) = intercept^t + \alpha^t_i + \beta^t_j + \gamma^t_k + \varepsilon^t_{ijk}. \tag{1}$$

where X represents the value of exports, β^t_j and γ^t_k 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, α^t_i 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.[21]

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 j.[22] The annual growth of country i's exports in period t is obtained as an approximation of the true logarithmic change in its exports:

$$d\ln X^t_i = \ln\left(\frac{X^t_i}{X^{t-1}_i}\right) \approx \sum_{jk} \frac{w^t_{ijk}}{w^t_i}\ \ln\left(\frac{X^t_{ijk}}{X^{t-1}_{ijk}}\right). \tag{2}$$

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.[23]

[20]The traditional shift-share analysis is actually a constrained and imperfect version of regression and variance analysis techniques.

[21]Data on 1994 flows serve as base year for 1994-1995 growth rates.

[22]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.

[23]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.

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:

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

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, $\sum_{jk} w_{ijk}^t\ \varepsilon_{ijk}^t = 0$.[24] 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 of partner and product effects to the estimated effect:

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

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 $\left(\sum_i w_i^t = \sum_j w_j^t = \sum_k w_k^t = 1\right)$ 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:

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

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.

[24] The last constraint is implicitly imposed when estimating (1) with weighted OLS.

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 1994-2007 period are obtained by summing up the different effects across years:

$$d\ln X_i^{94-07} \equiv \sum_t d\ln X_i^t = \sum_t LSMEAN_i^t + \sum_t \left(\sum_j \frac{w_{ij}^t}{w_i^t}\ \tilde{\beta}_j^t \right) + \sum_t \left(\sum_k \frac{w_{ik}^t}{w_i^t}\ \tilde{\gamma}_k^t \right). \quad (6)$$

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 1994-2007 growth of exports from China is the sum of these three effects computed for each year of the period.[25]

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, $d\ln X^{94-07}$, and take the exponentials of the resulting expressions.[26] We obtain:

$$g_i^{94-07} \equiv \exp\left(d\ln X_i^{94-07} - d\ln X^{94-07}\right) - 1 = PERF_i \ \times\ GEO_i \ \times\ SECT_i - 1 \quad (7)$$

where $PERF_i = \exp\left(\sum_t LSMEAN_i^t - d\ln X^{94-07}\right)$, 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 $d\ln X_i^{94-07}$ and $d\ln X^{94-07}$ are approximations of true logarithmic changes in country and world exports obtained with the Törnqvist index.[27] Therefore, g_i^{94-07} in equation (7) is an approximation of the actual market share growth rate.[28]

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.

[25] Figures corresponding to this example are displayed in the upper part of Table 7.

[26] Accordingly, we have $d\ln X^{94-07} \equiv \sum_t (d\ln X^t) = \sum_t \left(\sum_i w_i^t\ d\ln X_i^t \right)$.

[27] $\tilde{d}\ln X_i^{94-07} \approx \ln\left(X_i^{2007}/X_i^{1994}\right)$ and $\tilde{d}\ln X^{94-07} \approx \ln\left(X^{2007}/X^{1994}\right)$.

[28] Actual (true) market share growth rates are obtained as $\left(\frac{X_i^{2007}}{X^{2007}} - \frac{X_i^{1994}}{X^{1994}}\right) / \left(\frac{X_i^{1994}}{X^{1994}}\right)$.

4.2. Contributions to the changes in world market shares: all products

We now report the results of the shift-share analysis. 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. 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).[29] We explain the annual growth of all trade flows existing in any two consecutive years in the period 1994-2007. The statistical significance of fixed effects α_i^t, β_j^t, and γ_k^t by year is shown in Figures 2 to 4 in the Appendix.

Table 6 shows the differences between market shares considered in this section and those in section 2. The first three columns in Table 6 report the market shares in 1994 and 2007, and the difference between the two, already discussed in Section 2 (e.g. the EU25 loses 0.34 p.p. of the world market shares, Table 1). These figures refer to all trade flows except intra-EU trade and trade in mineral, specific, and non-classified products, i.e. the sample of the panel (1) of Table 4. The last 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 (4) gives changes in market share computed on flows existing in any two consecutive years. Note that the difference between column (3) and column (4) 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 (5) provides the same information as column (4), but now expressed in percentage terms: the 0.26 p.p. loss of the EU25 represents 1.3% of the value of its exports in 1994. In the last column we display the change in world market shares as computed with the Tornqvist index, i.e. g_i^{94-07} from equation (7).

To clarify the difference between the different columns if Table 6, let us consider the case of Chinese exports. In 1994 Chinese exports represented only 5.8% of the value of world trade; they increased by the year 2007 by 10.26 p.p. or 176.5%$[= (10.26/5.8)\cdot 100]$. When we exclude the extensive margin (flows that appeared and dissapeared over the period) and minor flows, the market share growth is 177.6%. If annual changes in exports are computed as a Törnqvist index (as in section 4.1), we obtain a growth rate of 188.3%.

The decomposition of changes in market shares computed using the Törnqvist index for all products taken as a whole over the entire period (1994-2007) is provided in the first part of Table 7. The 0.9% loss of world market share by the EU25 in the first column is the same figure as that in the last column of Table 6. This loss 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 per-

[29] However we continue to define unit values ranges and technological products at the HS6 level.

Table 6 – Changes in world market shares for large exporters (1994-2007): Comparison with results of Table 1

	Market share in USD terms			Change in market share when trade growth can be calculated		
				actual change		as computed with eq. (7)
	1994 % (1)	2007 % (2)	1994-2007 p.p. Δ (3)	1994-2007 p.p. Δ (4)	1994-2007 % Δ (5)	1994-2007 % Δ (6)
EU 25	**19.7**	**19.3**	**-0.34**	**-0.26**	**-1.3**	**-0.9**
EU 15	19.1	18.0	-1.06	-0.98	-5.2	-5.2
New Member States	0.6	1.3	0.71	0.72	126.0	147.8
USA	18.5	12.5	-5.97	-5.98	-32.2	-31.5
Japan	14.8	8.6	-6.23	-6.27	-42.0	-42.1
China	5.8	16.1	10.26	10.38	177.6	188.3
India	1.0	1.7	0.61	0.61	58.5	61.9
Russia	0.9	1.5	0.62	0.63	63.4	37.7
Brazil	1.5	1.6	0.10	0.11	7.5	12.4

Source: Authors' calculations. Figures in columns (1) to (3) are obtained using the sample of the panel (1) of Table 4. The difference between columns (3) and (4) 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. The difference between columns (5) and (6) is the approximation of the Törnqvist index. The percent change in market share in columns (5) and (6) are computed relatively to the 1994 world market share displayed in column (1).

formance, as well as the performance of most new member states, is striking and contrasts with the difficulty faced by the U.K., France, Denmark, Belgium-Luxembourg, and Sweden. Of the EU15, only Greece, Portugal, Italy, and Spain suffer from a poor sectoral specialisation (Table 13 in the Appendix).

However, the magnitude of EU losses (even EU15 ones) is much more limited than those recorded by Japan and the USA. Structural effects contribute positively to American market shares growth but negative performance effects are stronger. Japanese losses in market shares are particularly strong in the second sub-period (2001-2007), with only the sectoral specialisation contributing positively. All in all, EU performance remains satisfactory given the pressure of new competitors such as China and India. This resilience of EU market shares is particularly marked in the most recent period. In the second part of Table 7 we can see that this is largely due to the competitiveness of new member states: the EU15 market share in third markets is virtually unchanged, while the NMS10 almost doubled their market shares since 2001.

Table 7 – Shift-share decomposition of the percent changes in world market shares, *all products*, periods 1994-2007 and 2001-2007

	Change in market share as computed with eq. (7)	Contribution of:		
	% Δ	Performance	Structure effects	
			Geographic	Sectoral
	Period 1994-2007			
EU 25	**-0.9**	**-16.7**	**9.8**	**8.3**
EU 15	-5.2	-19.5	8.3	8.7
New Member States	147.8	74.1	45.8	-2.4
USA	-31.5	-38.9	3.9	7.8
Japan	-42.1	-48.1	-2.4	14.2
China	188.3	358.0	-18.4	-22.9
India	61.9	103.7	1.1	-21.4
Russia	37.7	-10.6	37.1	12.4
Brazil	12.4	40.0	-3.1	-17.1
	Period 2001-2007			
EU25	**8.2**	**-7.0**	**10.4**	**5.4**
EU15	4.1	-9.4	8.8	5.5
New Member States	129.5	54.4	45.2	2.4
USA	-31.8	-33.3	-0.8	3.1
Japan	-27.7	-30.3	-1.1	4.9
China	103.8	165.8	-11.3	-13.6
India	48.5	53.4	3.1	-6.1
Russia	26.2	-22.5	32.0	23.4
Brazil	33.6	37.0	-0.3	-2.2

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).

4.3. 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 already stressed, the two dimensions are considered here 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, as in the previous sections, 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.

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:[30]

- 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.

Regarding high-tech products, results are reported in the upper part of Table 8. We observe a 6.9% 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. 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.

In contrast, US and Japan lose within the decade about half of their 1994 market shares, due to a massive relocation of their assembly lines in Asia, in particular in China. For the US this is partly due to an even more pronounced specialisation in products with highly growing import demand. Market share losses of developed countries are compensated by large gains recorded by many developing countries. India and China stand out with the best performances, by multiplying their initial market shares by three, and respectively six.

We now shift to the second part of Table 8, focusing on the upper segment of the world market. For the EU, the positive market share growth for up-market products (+1.6%) contrasts with the global result (-0.9% in Table 7) 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. However, the European export performance is again negative, but still much less than for the whole sample of products (and less than 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, Japan and the US have benefited from a favourable geographical orientation of their exports of up-market products, thanks to a larger orientation toward a fast growing Asian market.

[30]Non-shifters (e.g. top range in t_0 and t_1) are kept in their initial range indeed.

Table 8 – Shift-share decomposition of the percent changes in world market shares, *technological products* and *up-market products*, 1994-2007

	Change in market share as computed with eq. (7)	Contribution of:		
	% Δ	Performance	Structure effects	
			Geographic	Sectoral
	Technological products			
EU 25	**6.9**	**-13.6**	**0.8**	**22.8**
EU 15	0.5	-18.8	0.1	23.7
New Member States	424.6	344.8	11.0	6.3
USA	-45.4	-52.7	6.8	8.1
Japan	-61.9	-63.1	5.4	-2.0
China	541.7	802.3	-13.5	-17.8
India	230.6	123.8	4.8	40.9
Russia	73.1	14.4	47.7	2.4
Brazil	177.5	194.4	-19.2	16.6
	Up-market products			
EU 25	**1.6**	**-1.5**	**-4.6**	**8.2**
EU 15	-2.2	-4.9	-5.2	8.4
New Member States	437.3	396.9	11.3	-2.9
USA	-32.2	-35.3	4.0	0.7
Japan	-34.8	-44.5	10.3	6.5
China	453.2	864.6	-13.5	-33.7
India	236.6	317.6	-3.2	-16.7
Russia	37.2	-17.3	27.2	30.5
Brazil	-2.9	28.2	-12.2	-13.7

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).

5. 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 19.3% for goods (excluding energy) losing only 0.34 percentage points over the period (1994-2007). Market share losses are considerably more important in the case of the United States and Japan with 6 and 6.2 percentage points decline respectively. The US and Japan now account for 12.5%, and respectively 8.6% 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 1994 and 2007, they represent less than 15% 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 1994 and 2007 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.

Regarding high-tech and up-market products, the EU slightly 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 specialisation 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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6. APPENDIX

6.1. Data description

Trade data used in this paper are from the BACI database, a new database for the analysis of international trade developed by Gaulier & Zignago (2010). BACI draws on the UN COMTRADE information but, contrary to COMTRADE, in which imports are reported CIF (cost, insurance and freight) and the exports FOB (free on board), BACI provides FOB data for both types of trade flows. Thus, 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 reporting. The quantity units are converted into tons, making possible the computation of homogeneous unit values. BACI is available to COMTRADE users at: http://www.cepii.fr/anglaisgraph/bdd/baci.htm

In this work, we consider world exports from 1995 to 2005 for largest exporters in the world: EU, US, Japan, and four larger emerging countries (BRIC for Brazil, Russia, India and China). However, due to changes in the quantities estimation methodology used by the UN to build COMTRADE.

BACI covers trade between more than 200 countries, in about the 5,000 products of the 6 digits Harmonised System (HS) classification. However, this study excludes intra-EU25 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.[31] Trade flows inferior to USD 10,000 are excluded, as well as those weighting less than 2 tons in panel (2) of Section 3 tables and in "shift-share" section 4. For this analysis 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 growth of trade discussed in that section.

Concerning the high-tech products, we use the classification in broad sectors proposed by Lall (2000), which is detailed in Table 9.

We rely on observed values of traded products to infer their market positioning. Trade flows are ordered according unit values and classified accordingly into three ranges: 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 - *up-market*. We employ the technique developed by Fontagné et al. (2008) to construct the three market segments, and end up with similar size groups. 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.

[31] 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.

Table 9 – The classification of sectors according to the technological content, Lall (2000)

Classification	Examples
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).

6.2. Other results

Table 10 – Changes in world market shares 1994-2007, by EU25 member states

	Market shares, %			Δ in market shares, p.p.		
Exporter	1994	2000	2007	94-07	94-00	00-07
EU 25	**19.7**	**18.1**	**19.3**	**-0.34**	**-1.58**	**1.23**
Germany	5.50	4.67	5.52	0.02	-0.82	0.85
Italy	2.65	2.23	2.34	-0.31	-0.42	0.11
France	2.77	2.41	2.29	-0.49	-0.36	-0.12
United Kingdom	2.85	2.57	1.95	-0.89	-0.28	-0.61
Netherlands	1.07	0.95	1.05	-0.02	-0.12	0.10
Belgium-Luxembourg	0.81	0.98	0.98	0.18	0.17	0.01
Spain	0.75	0.71	0.79	0.04	-0.04	0.09
Sweden	0.83	0.84	0.76	-0.08	0.00	-0.08
Ireland	0.34	0.76	0.67	0.33	0.42	-0.08
Austria	0.44	0.38	0.58	0.14	-0.06	0.21
Finland	0.40	0.42	0.48	0.07	0.02	0.05
Poland	0.15	0.15	0.38	0.22	0.00	0.22
Denmark	0.46	0.36	0.36	-0.10	-0.11	0.01
Hungary	0.11	0.16	0.29	0.19	0.06	0.13
Czech Rep.	0.12	0.12	0.25	0.14	0.00	0.14
Portugal	0.12	0.11	0.14	0.02	-0.01	0.02
Slovakia	0.05	0.04	0.13	0.08	-0.01	0.09
Greece	0.10	0.09	0.11	0.01	0.00	0.01
Slovenia	0.07	0.06	0.10	0.03	-0.01	0.04
Lithuania	0.04	0.02	0.06	0.02	-0.01	0.04
Estonia	0.00	0.02	0.03	0.03	0.02	0.01
Malta	0.02	0.04	0.03	0.01	0.02	-0.01
Latvia	0.02	0.01	0.03	0.00	-0.01	0.01
Cyprus	0.02	0.01	0.01	-0.01	-0.01	0.00

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.). Countries are sorted by decreasing 2007 market shares.

Table 11 – Change in world market shares for high-tech products and by market segment. EU25 member states

	High-tech products		Up-market		Mid-market		Low-market	
Exporter	2007 %	*94-07* p.p. Δ	2007 %	*94-07* p.p. Δ	2007 %	*94-07* p.p. Δ	2007 %	*94-07* p.p. Δ
EU 25	**16.9**	*0.81*	**28.8**	*0.83*	**16.8**	*-1.51*	**16.1**	*0.25*
Germany	4.49	*0.53*	7.71	*-1.93*	5.14	*0.02*	4.59	*1.32*
France	2.88	*-0.25*	3.69	*-0.43*	1.91	*-0.71*	1.75	*-0.40*
United Kingdom	1.98	*-1.18*	3.10	*-0.70*	1.65	*-0.95*	1.55	*-0.71*
Ireland	1.08	*0.56*	1.92	*1.30*	0.26	*0.05*	0.28	*0.04*
Italy	1.05	*-0.18*	3.26	*0.23*	1.99	*-0.40*	2.17	*-0.68*
Netherlands	0.95	*-0.06*	1.61	*0.24*	0.92	*-0.28*	0.82	*-0.07*
Sweden	0.75	*-0.14*	1.20	*-0.02*	0.65	*-0.17*	0.58	*0.00*
Belgium-Luxembourg	0.58	*0.14*	1.41	*0.50*	1.01	*0.43*	0.69	*0.26*
Finland	0.54	*0.23*	0.70	*0.23*	0.45	*-0.03*	0.36	*0.02*
Hungary	0.53	*0.46*	0.31	*0.23*	0.27	*0.18*	0.32	*0.15*
Spain	0.46	*0.01*	1.03	*0.23*	0.66	*-0.14*	0.81	*-0.02*
Austria	0.44	*0.17*	0.97	*0.24*	0.46	*0.11*	0.47	*0.13*
Denmark	0.40	*0.05*	0.60	*-0.09*	0.30	*-0.11*	0.28	*-0.13*
Czech Rep.	0.22	*0.18*	0.30	*0.23*	0.21	*0.11*	0.28	*0.08*
Portugal	0.12	*0.08*	0.18	*0.02*	0.11	*-0.02*	0.14	*0.04*
Poland	0.11	*0.06*	0.32	*0.26*	0.33	*0.20*	0.47	*0.18*
Slovenia	0.09	*0.04*	0.10	*0.04*	0.08	*0.01*	0.13	*0.02*
Malta	0.08	*0.03*	0.04	*0.03*	0.01	*0.01*	0.04	*0.04*
Slovakia	0.07	*0.06*	0.12	*0.11*	0.14	*0.11*	0.13	*0.02*
Greece	0.03	*0.01*	0.11	*0.03*	0.11	*0.01*	0.11	*-0.03*
Lithuania	0.03	*0.00*	0.05	*0.03*	0.05	*0.03*	0.08	*0.01*
Latvia	0.01	*0.00*	0.02	*0.02*	0.02	*0.01*	0.03	*-0.02*
Cyprus	0.01	*0.00*	0.01	*0.00*	0.01	*-0.01*	0.02	*-0.02*
Estonia	0.01	*0.01*	0.04	*0.04*	0.03	*0.02*	0.03	*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.).

Table 12 – Extensive and intensive margins in 1994-2007: EU25 member states, %

	(1) All trade flows			(2) Our (reduced) sample		
	Intensive Margin	Extensive Margin + (Entries)	Extensive Margin − (Exits)	Intensive Margin	Extensive Margin + (Entries)	Extensive Margin − (Exits)
	(a)	(b)	(c)	(d)	(e)	(f)
EU 25	**96.9**	**4.5**	**1.4**	**96.1**	**5.7**	**1.8**
Germany	93.3	8.9	2.2	92.6	10.3	2.9
United Kingdom	93.2	14.0	7.2	91.3	18.4	9.7
Ireland	90.7	12.3	2.9	82.6	20.9	3.5
Italy	88.4	15.4	3.8	85.2	19.7	4.9
France	87.0	19.0	5.9	84.3	23.1	7.4
Netherlands	86.4	21.8	8.2	81.9	28.3	10.2
Denmark	82.1	29.4	11.6	78.0	36.1	14.1
Sweden	81.7	23.0	4.7	76.4	29.5	5.9
Finland	81.2	24.0	5.1	76.3	29.9	6.2
Austria	77.1	27.5	4.6	68.5	37.4	5.9
Spain	70.6	37.2	7.8	63.8	46.2	10.0
Portugal	67.3	40.4	7.8	58.0	52.0	10.0
Malta	57.3	49.6	6.8	56.0	51.1	7.0
Hungary	55.8	48.2	4.0	42.0	62.9	5.0
Czech Rep.	53.6	52.7	6.2	41.7	65.6	7.3
Belgium-Lux.	50.2	52.9	3.1	47.9	56.2	4.1
Slovenia	47.7	58.0	5.7	42.2	65.2	7.4
Greece	47.2	63.3	10.5	37.0	75.1	12.1
Lithuania	46.0	62.7	8.7	40.4	70.5	10.9
Latvia	41.9	74.5	16.4	31.6	88.4	19.9
Poland	39.4	65.9	5.3	37.4	68.4	5.9
Slovakia	32.7	74.0	6.7	25.2	82.5	7.7
Estonia	11.9	90.1	2.0	9.6	92.8	2.4
Cyprus	0.9	160.7	61.6	-5.0	176.0	71.0

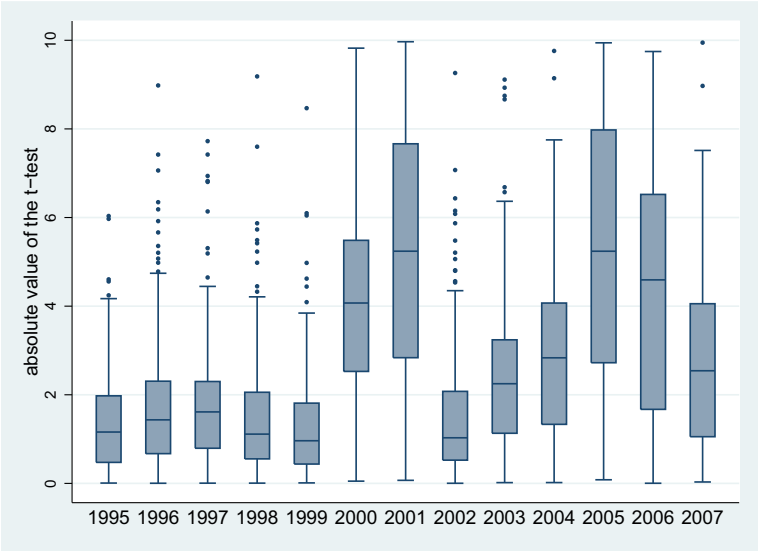
Source: Authors' calculations using BACI data. The samples used in panels (1) and (2) are similar to Table 4. Columns (a) and (d) refer to the contribution of export flows (product $\times$ destination market) present both in 1994 and 2007. The other columns refer to the contribution of export flows appearing (positive contribution) or disappearing (resp. negative) over the period. Columns sum as follows: $(a) + (b) - (c) = 100$ and $(d) + (e) - (f) = 100$.

Table 13 – Shift-share decomposition of the percent changes in world market shares, *all products*, 1994-2007: EU25 member states

	Change in market share as computed with eq. (7)	Contribution of:		
	% Δ	Performance	Structure effects	
			Geographic	Sectoral
EU 25	**-0.9**	**-16.7**	**9.8**	**8.3**
Austria	35.5	10.8	15.3	6.1
Belgium-Luxembourg	-2.5	-25.3	12.3	16.3
Denmark	-26.0	-29.5	0.3	4.7
Finland	23.1	-4.5	21.6	6.0
France	-15.7	-29.9	8.9	10.4
Germany	2.2	-17.9	10.3	12.9
Greece	7.3	-11.8	54.0	-21.0
Ireland	120.8	102.5	-16.4	30.5
Italy	-10.3	-14.2	13.8	-8.2
Netherlands	0.5	-16.3	11.9	7.2
Portugal	13.3	22.7	11.0	-16.8
Spain	5.3	0.9	9.0	-4.2
Sweden	-6.4	-22.6	5.5	14.7
United kingdom	-31.8	-41.0	0.7	14.8
Cyprus	-27.9	-34.4	33.2	-17.4
Czech republic	146.3	79.4	39.7	-1.7
Estonia	183.2	143.8	35.5	-14.2
Hungary	228.1	119.1	52.4	-1.7
Latvia	-8.5	-27.7	46.8	-13.7
Lithuania	23.3	-21.2	71.8	-8.9
Malta	45.2	49.1	-11.3	9.8
Poland	177.7	99.7	46.6	-5.1
Slovakia	534.3	349.6	40.4	0.5
Slovenia	52.9	-16.2	71.5	6.4

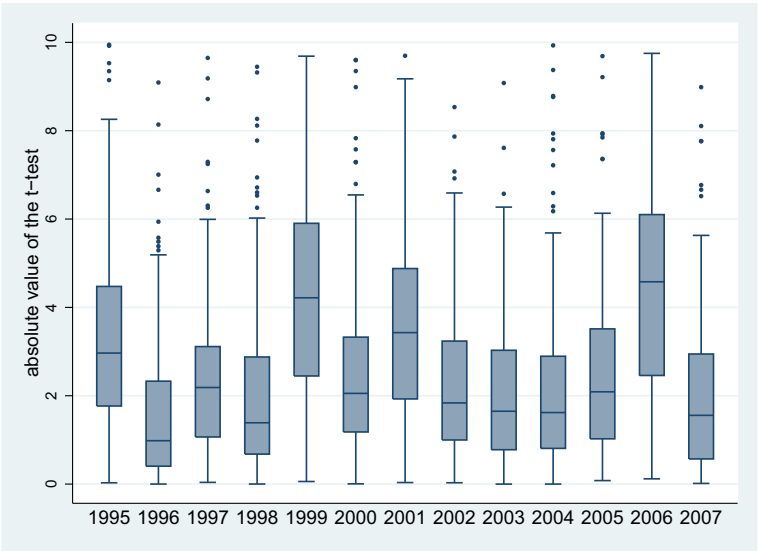
Source: Authors' calculations using all trade flows existing in any two consecutive years in the considered period, except flows associated with HS sections 25, 26, 27, 97, 98, 99, tiny values (below USD 10,000), non-independent territories and micro-states. The estimation is performed at the 2-digit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

Figure 2 – Standard errors of exporter fixed effects, central values (from 0 to 10)



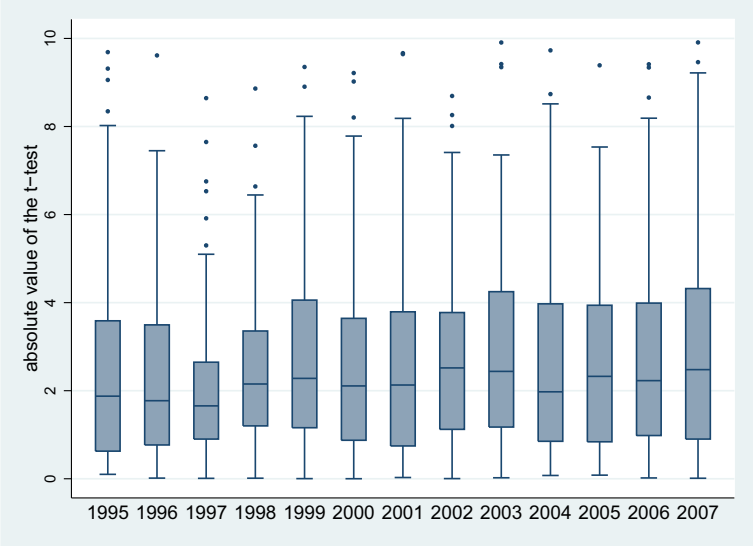
Source: Authors' calculations using all trade flows existing in any two consecutive years in the period 1994-2007, except flows associated with HS sections 25, 26, 27, 97, 98, 99, tiny values (below USD 10,000), non-independent territories and micro-states. The estimation is performed at the 2-digit level of the HS.

Figure 3 – Standard errors of importer fixed effects, central values (from 0 to 10)



Source: Authors' calculations using all trade flows existing in any two consecutive years in the period 1994-2007, 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 4 – Standard errors of product fixed effects, central values (from 0 to 10)



Source: Authors' calculations using all trade flows existing in any two consecutive years in the period 1994-2007, 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.