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A CLOSER LOOK USING SHIFT-SHARE ANALYSIS

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A STAFF WORKING PAPER

BY

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Shift-Share Analysis aims to break down total change of economic indicators into various components to identify underlying sources of growth or decline. A key feature is that the unit of analysis (e.g. a city, a region or a country) exists within a broader frame of reference that strongly influences it (e.g. a national productive system or the world economy). It is based on the principle that total change can be disaggregated into contributing factors and any change that can not be accounted for by these factors can be interpreted as the "local contribution" to that total change.

This method has been subject to many refinements. Because the objectives of this paper are both didactic and analytic, traditional Shift-Share Analysis is applied to international trade. It uses the "constant market share" assumption by decomposing the growth of exports into four separate components: a global component (GLOBO) indicating changes due to overall growth of world trade, a geographical component (GEO) indicating changes due to the country's distribution of trading partners, a product composition component (COMPO) indicating growth due to the mix of products exported, and a residual term (the "local" contribution) indicating changes in competitiveness, or performance (PERFO). The first 3 components, GLOBO, COMPO and GEO all relate to the "expected change in trade" should trade change proportionally. The fourth and residual component, PERFO, refers to that part of the change in trade that "shifts away" from expected proportional changes, hence the term "Shift-Share Analysis".

This paper will analyse a change or "shift" in shares in trade (particularly exports) of different economies. By focusing on selected time periods and using the PERFO indicator, the method will show what industries shift away from the expected change in trade, which economies have experienced such shifts in their industries, and to which regions.

: Shift-Share Analysis, International Trade

: C49, F13, F14

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TABLE 3A. CHINA'

AFRICA
AGRICULTURE PRODUCTS
ASIA
CENTRE ETUDES PROSPECTIVES INFORMATIONS INTERNATIONALES
COMMONWEALTH OF INDEPENDENT STATES
SECTORAL OR INDUSTRY EFFECT
S

This document examines the extent to which Shift-Share Analysis can be applied to international trade. It focuses in particular on determining whether this method of analysis can provide a useful summary measure of export competitiveness for countries, regions and economic groupings over time, and whether it correctly identifies countries which the method shows to be export competitive.

Shift-Share Analysis has been used by international trade analysts for many years, though limited by a number of well-documented problems with the methodology. Certain refinements, however, can give the technique some renewed relevance. Even in its traditional form, Shift-Share Analysis continues to be an accepted analytical tool for researchers and policy makers in that it can provide clear answers to a number of important questions in international tr

This section gives readers an insight of documentation that has been published on shift-share analysis – its use, how it is calculated, its application to international trade, what other fields it has been previously applied to, how to further refine it.

Shift-Share Analysis (SSA) is a statistical technique in which discrete changes in a variable are broken down into various components to identify underlying sources of growth or decline. This type of analysis has been widely used to examine changes in employment by geographic area, but it can also be applied to questions of export competitiveness in international trade. A key feature of SSA is that the unit of analysis (e.g. a city, a region or a country) exists within a broader frame of reference that strongly influences it (e.g. the national productive system or the world economy). For example, changes in employment in a particular city can be attributed at least in part to employment growth at the national level, or to the changing mix of industries present in the city. Similarly, the growth of a

Diagram 1.

SHIFT-SHARE ANALYSIS

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Before proceeding, we need to introduce some notation conventions and establish a number of definitions[1]. In order to keep the notation relatively uncluttered we use the following conventions.

Let

$V_{i.}$ = the value of country A's exports of product i in period 1,

[1] Notation taken from Leamer and Stern (1970), Quantitative International Economics, p. 172.

$V'_{i.}$ = the value of country A's exports of product i in period 2,
$V_{.j}$ = the value of country A's exports to country j in period 1,
$V'_{.j}$ = the value of country A's exports to country j in period 2,
V_{ij} = the value of country A's exports of product i to country j in period 1,
V'_{ij} = the value of country A's exports of product i to country j in period 2,
r = percentage change in world exports between periods 1 and 2,
r_i = percentage change in world exports of product i between periods 1 and 2, and
r_{ij} = percentage change in world exports of product i to country j between periods 1 and 2.

Note: All of the above definitions apply to a single reporting[2] country even though many countries will typically be considered in any shift-share table. Since in practice we will always be focusing on one exporting country or region at a time, an additional index would only serve to clutter the formulas.

The above definitions imply that

$$\Sigma_j V_{ij} = V_i$$
and
$$\Sigma_i V_{ij} = V_{.j}$$

in period 1, with similarly results holding in period 2 with the addition of a prime symbol. In words, we can obtain country A's total exports of good i by summing V_{ij} over all trading partners, which are indexed by j. Similarly, by summing V_{ij} over all products using the i index produces total exports of country A to country j.

Country A's total merchandise exports can be obtained by aggregating over all products i and all partner countries j, as follows:

$$\Sigma_i\Sigma_j V_{ij} = \Sigma_j V_{.j} = \Sigma_i V_{i.} = V$$

The above expression says that total merchandise exports can be obtained in one of three ways. First, by privileging a product composition approach, an
par-7.36.3(g))5.371..68(m)5.2i21.[=)]TJ/TT1 1 4 2-160687 0 TD0 Tc0 Tw<0208>Tj/TT2 1 Tf6.6044 0 0 6.6025Tf 294

$$V'_{..} - V_{..} \equiv rV + (V'$$

EXPORTS' GROWTH = GLOBO (1) + COMPO(2) + GEO(3) + PERFO (4)

The final output is a table showing the growth of exports for all available countries broken down by the change due to increasing world trade, the commodity composition of exports, the market distribution of exports and a competitiveness residual. Each of these components can be either positive or negative, but they should all add up to the overall change in exports, whether these are expressed in percentage or other terms.

The residual (4) in this final decomposition must be interpreted with care. In contrast to the first three terms on the right hand side, the PERFO effect is not observed and is not even measurable. Like the Solow residual in economic growth accounting, it can be seen as the "measure of our ignorance" since it captures the cumulative effect of all factors other than GLOBO, COMBO and GEO that could conceivably influence a country's exports. It is possible to interpret it as an indicator of competitiveness, but only in a very broad sense. For example, a natural disaster such as a hurricane could reduce a country's ability to export independently of trends in world trade or the mix of export products and partners. It is possible to view such

This section shows the accounting side of the method, i.e. how each of the 4 effects, GLOBO, COMPO, GEO and PERFO are mechanically calculated, using a sample of 6 countries and 3 product groups

Table 1c. Total exports by selected destinations, 2002 and 2007
(Percentage, %)

Percentage change, % (r)							
Destination (j) / Product (i)	Total	EU27	RU	JP	CN	USA	CA
TOTAL(6)	105%						

The total change in US exports was due to a potential increase of roughly 165% in the share of total exports supposedly due to the positive total exports behaviour of all 6 countries together. The COMPO gives a total of 13.4% representing share of exports "lost" due to global behaviour of the 3 individual sectors, agriculture, fuels and mining and manufacturing. A 6.7% share of exports increased due to the respective behaviour of the 5 individual partners, and 58% "lost" to due to losses of competitiveness. Hence, by isolating the global, product or sectoral and geographical effect, the results indicate that along with other unknown factors, the United States' domestic economy was not "competitive" enough (or export-oriented enough) to be able to increase its exports in line with other partners, and therefore, lost market shares.

Each of these total effects could also be disaggrated by product group. For instance, of the potential 165% increase in share in total exports expected to be attributed to the GLOBO effect, 142%, (i.e. 105/100*319552), would have been the potential increase in manufactures.

While this method proves useful in that it isolates and approximates changes due to global, sectoral and geographical behaviour in the merchandise trade of an economy between 2 specified periods, this technique is limited in that it says nothing further than assuming that the remaining or "residual" change in trade is attributed to "everything else", assuming this to be none other than the “local” factor (or the PERFO effect), i.e. a measure of the economy's own ability to be competitive and export-oriented given its own domestic economic and policy conditions.

Because SSA is based on changes and does not reflect the economies' levels of development, it cannot be used to compare the relative positions of countries in terms of competitiveness, and only indicates changes in this indicator. For example, it would be logical to expect that developing countries as a group tend to show a positive PERFO indicator, because they are gradually catching up with industrialised countries. Chart 1 below somewhat reflects these assumptions. In 2002-2007, a negative sign or near 0 value is seen for developed countries' performance and a number of developing countries show positive PERFO shares. A more complete picture of how most countries fared in both periods and showing the sizes of their economies can be seen in Charts 2 and 3 further below.

Chart 2. Shift-Share Analysis of selected economies, 1996-2002

Chart 3. Shift-Share Analysis of selected economies, 2002-2007
(Percentage)

Another shortcoming of the method would be that it is based on market shares. This necessarily gives the analyst a mercantilist vision of world trade, i.e. a "zero-sum" game where the one's gains are somebody else'eha3(il)-6.5()10.8lsres( )-5.8 Iin particua, (it)-5.8w(oul)-6.5d bn(e)27(t i)-658(n)]TJ21.6508605 TD0.0005 vs. Aitsile pslas( )-5.8(cabs)-5.6(fi)-618od.especa wimssi(er)-618ing tise fi ti

little "near-zero" data as possible. Consequently, small values have to be flagged when interpreting the results.

A well known problem with the traditional approach to SSA is that the numerical values of the COMPO and GEO effects are not invariant to the order of calculation. In other words, different results are obtained depending on whether the effect of COMPO is removed before GEO or vice versa. Consider the illustration below using China as an example (with the same 6 trading partners as specified previously),

(I.E. DESTINATIONS ON ROWS, PRODUCTS ON COLUMNS):

Table 3a. China's total exports to selected destinations and by major product, 2002 and 2007 (mil USD)

2002 (V')				
Product (j) / Destination (i)	Total	AG	MI	MA
TOTAL	219182	12586	6680	199916
EU(27)	64656	2609	1653	60394
RU	3521	441	71	3009
JP	55291	7066	3617	44607
CN	0	0	0	0
USA	91412	2284	1251	87877
CA	4303	185	88	4029
2007 (V')				
Product (j) / Destination (i)	Total	AG	MI	MA
TOTAL	760011	25375	20087	714549
EU(27)	299091	7222	7241	284627
RU	28467	1202		

Box 2. Calculation of classic shift-share of China total exports in 2002-2007, (transposed order)

The example above shows very slight differences in the COMPO and GEO effect. Nevertheless, the PERFO as well as the GLOBO effect remain the same. Although the numbers may differ slightly depending on the order of calculation, qualitative results tend to be very similar regardless of how they were arrived at, e.g. a large positive or negative GEO, COMPO or PERFO effect tends to remain large and retain its sign in either case, however numbers close to zero are more problematic since they may easily change sign from period to period (i.e., the results are not robust).

More importantly, results are also sensitive to product classification, the level of disaggregation of the

The traditional SSA has been progressively enriched to correct shortcomings and cover new fields. Among these additions, the paper will address two of them.

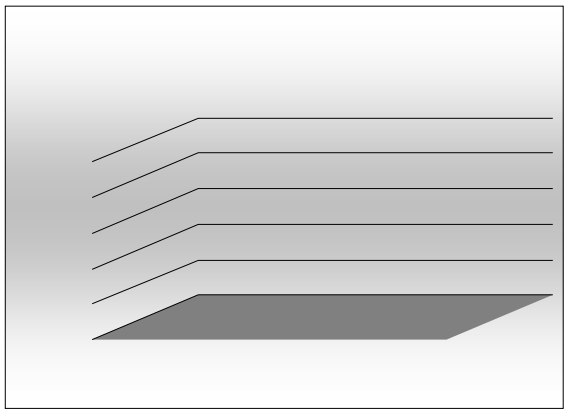
A source of difficulty in interpretation using classic shift share is the fact that the above equations are expressed in nominal terms. Using nominal values doesn't take into account commodity price changes that may have affected the total export values, i.e. making comparisons across countries can be difficult when relative prices fluctuate heavily during the period under review. In such a situation, large changes in relative prices can result into large changes in market share, without a clear relationship with economic policy or structural factors affecting countries' respective competitiveness. Such price fluctuations which are mostly beyond the control of national economic policies may distort results. To go around this, total exports values were deflated with IMF world commodity prices, especially in the mining sector where exports may have been significantly affected by prices of crude oil which had risen starting 2002, or by prices of food which had gone up in 2007.

Using dynamic shift-share instead of classic shift-share is also another refinement to SSA. Classic shift-share only takes into account exports values of the start year and the end year, where such end values could also be outliers. The advantage of dynamic shift-share analysis is that it literally is, a sum of all classic shift-share calculations of each pair of adjacent years, hence, taking into account movements in exports values in the in-between years. The disadvantage is that it may be cumbersome and more difficult to interpret. The present analysis opted for a "middle of the road" approach segmenting the time frame into smaller periods.

Illustrated in Chart 4 below are the SSA results for United States' total exports comparing various methodological modifications. The charts show that results can differ depending on the type of SSA

Chart 4. United States' total exports and Shift-Share Analysis, 1996-2007
(Percentage)

USING CLASSIC SHIFT-SHARE, 1996-2002, 6 TRADING PARTNERS



The classical method of SSA was used in this exercise, thus, only taking into account data of the starting and ending years of each period, and hence, not taking into account fluctuations of data that may have occurred in the years in between. Because two subperiods are used, the SSA results on the 1996-2007 period can be checked against the subperiods.

In this exercise, we focus our interest on the performance "competitiveness" effect as it is the effect that gives us an indication of how much of the change in a given industry is assumed to be due to some unique competitive advantage that the country possesses, i.e. how much of the growth that cannot be explained by the export behaviour of the global economy as a whole, the global trends in each industry covered, or the global behaviour of the various regional partners. It is also the weakest one on methodoligical ground, being a "residual", i.e. a measure of unknown causes.

When was a country considered to be a “Performer”? In mechanical terms, countries whose PERFO effect > 0 were the countries categorized as being the “Performers” of the group. Annex II Table A2 shows a listing of all economies considered sorted by descending PERFO effect. Using this very general criteria (PERFO > 0), however, the table shows a long list of countries having positive PERFO indicators. So the real question is, how can this list be narrowed down to find the bonafide performers in the group? In other words,

A country was initially categorized as a "Performer" when it showed a positive PERFO effect in its shift-share calculation, i.e. PERFO > 0. But because many countries qualified in this criteria, some additional criteria had to be introduced.

In this analysis, the "Performers" were categorized into 2 main groups: the CONSISTENT performers and the OCCASIONAL performers. Among the consistent performers are 3 subgroups: the "CONFIRMED" performers, the "PARTIAL" performers, and the "SLOW" performers. In particular,

"CONSISTENT" performers were countries who were in any one of the 3 categories below, for both 1996-2002 and 2002-2007, and for the comned period of 1.0469b996-200.0469b7;

" performers were considered to have the following criteria:

(a) PERFO IS > 0;
(b)

(d) THE SECTOR IN WHICH ITS PERFO EFFECT IS AT ITS MAXIMUM IS THE SAME AS ITS MAIN EXPORTED OR PREDOMINANTLY EXPORTED SECTOR

performers had the following criteria:

(a) PERFO IS > 0;
(b) TOTAL EXPORTS > "WORLD" (I.E. ALL COUNTRIES) TOTAL EXPORTS GROWTH RATE. BUT;
(c) PERFO EFFECT IS NOT THE MAXIMUM. MAXIMUM SECTOR IS EITHER COVERED BY ANY OF THE ABOVE EFFECTS OR NOT AT ALL.

performers had the following criteria:

(a) PERFO is > 0;
(b) TOTAL EXPORTS GROWTH RATE < WORLD EXPORTS GROWTH RATE;

On the other hand,

"OCCASIONAL" performers were countries who were in any one of the 3 categories of performers above (but not always in the same category), for 1996-2002, 2002-2007, and the combined period 1996-2007. (Note: An "OCCASIONAL" would be a better category than a "SLOW" performer).

"NON-PERFORMERS" were simply countries whose PERFO effect < 0 [5]

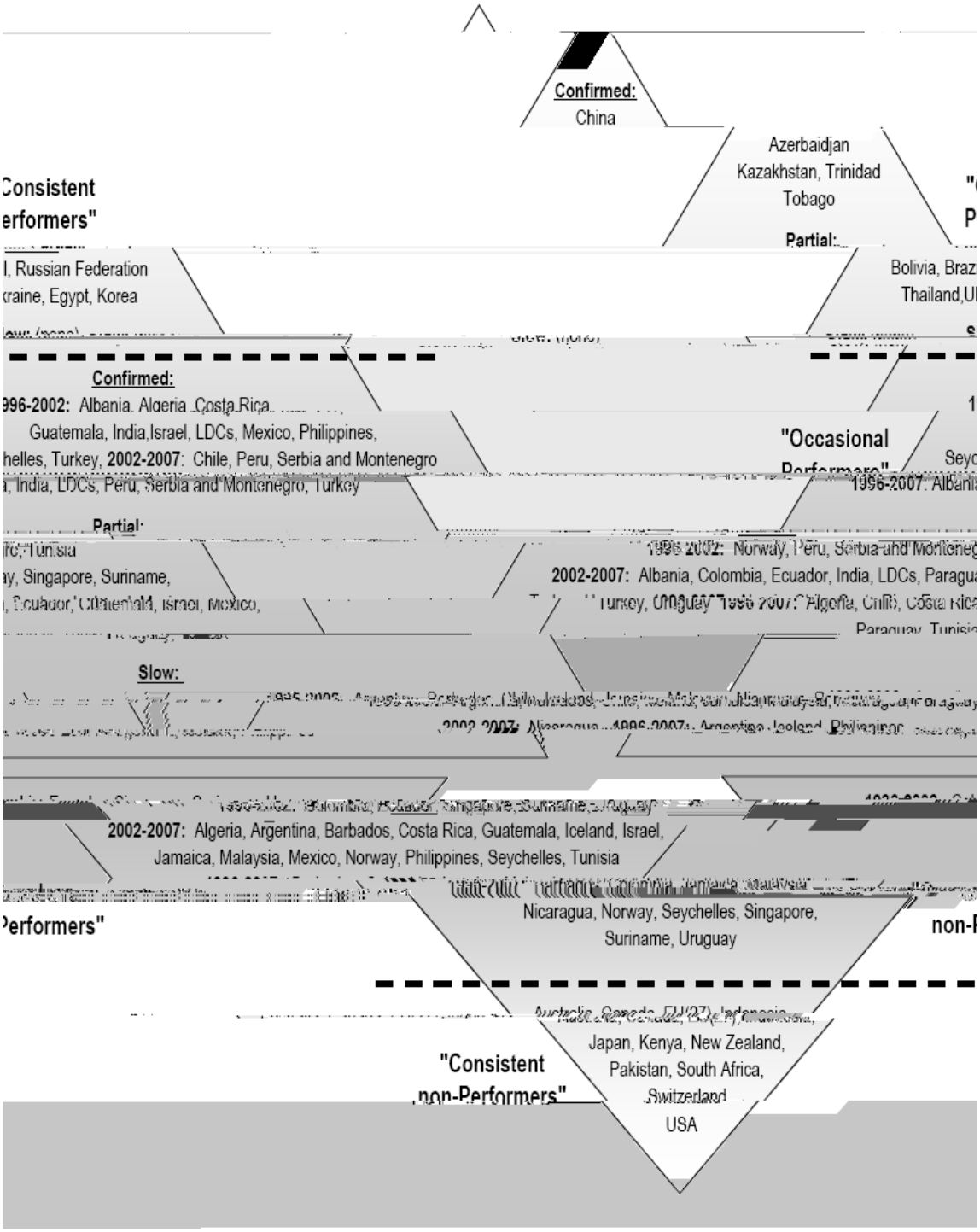
THE DEVELOPING COUNTRIES

	1996-2002					2002-2007				
	Globo	Compo	Geo	Perfo	Total	Globo	Compo	Geo	Perfo	Total
Pharmaceuticals	2	3	0	7	13	4	0	0	0	4
Other chemicals	16	8	5	-12	17	17	1	-1	-5	11
Other semi-manufactures	10	-3	4	-2	9	10	-2	-2	-2	6
Machinery and transport equipment	89	23	7	-57	62	86	-17	-4	-25	40
Office and telecom equipment	30	20	-3	-42	6	27	-10	1	-13	5
EDP and office equipment	13	7	-2	-27	-9	10	-4	0	-4	1
Telecommunications equipment	6	4	-1	-4	5	6	-1	0	-3	3
Integrated circuits	11	9	0	-10	10	11	-5	0	-5	1
Transport equipment	28	4	8	-5	35	30	-7	-3	-3	18
Automotive products	16	8	8	-14	17	17	-4	-4	1	9
Other transport equipment	12	-3	1	9	18	13	-3	1	-3	9
Other machinery	31	-2	1	-10	20	29	-1	-1	-10	17
Textiles	2	-2	3	1	4	3	-1	0	-1	0
Clothing	2	0	0	-4	-2	1	-1	0	-1	0
Other manufactures	17	0	2	1	20	18	-2	0	-6	10
Personal and household goods	1	0	0	-1	1	1	0	0	0	0
Scientific and controlling instruments	6	0	0	5	11	7	1	0	-5	4
Miscellaneous manufactures	10	0	1	-3	8	10	-2	-1	-1	5

Source: Authors' calculation based on WTO Statistics and the United Nations Comtrade database.

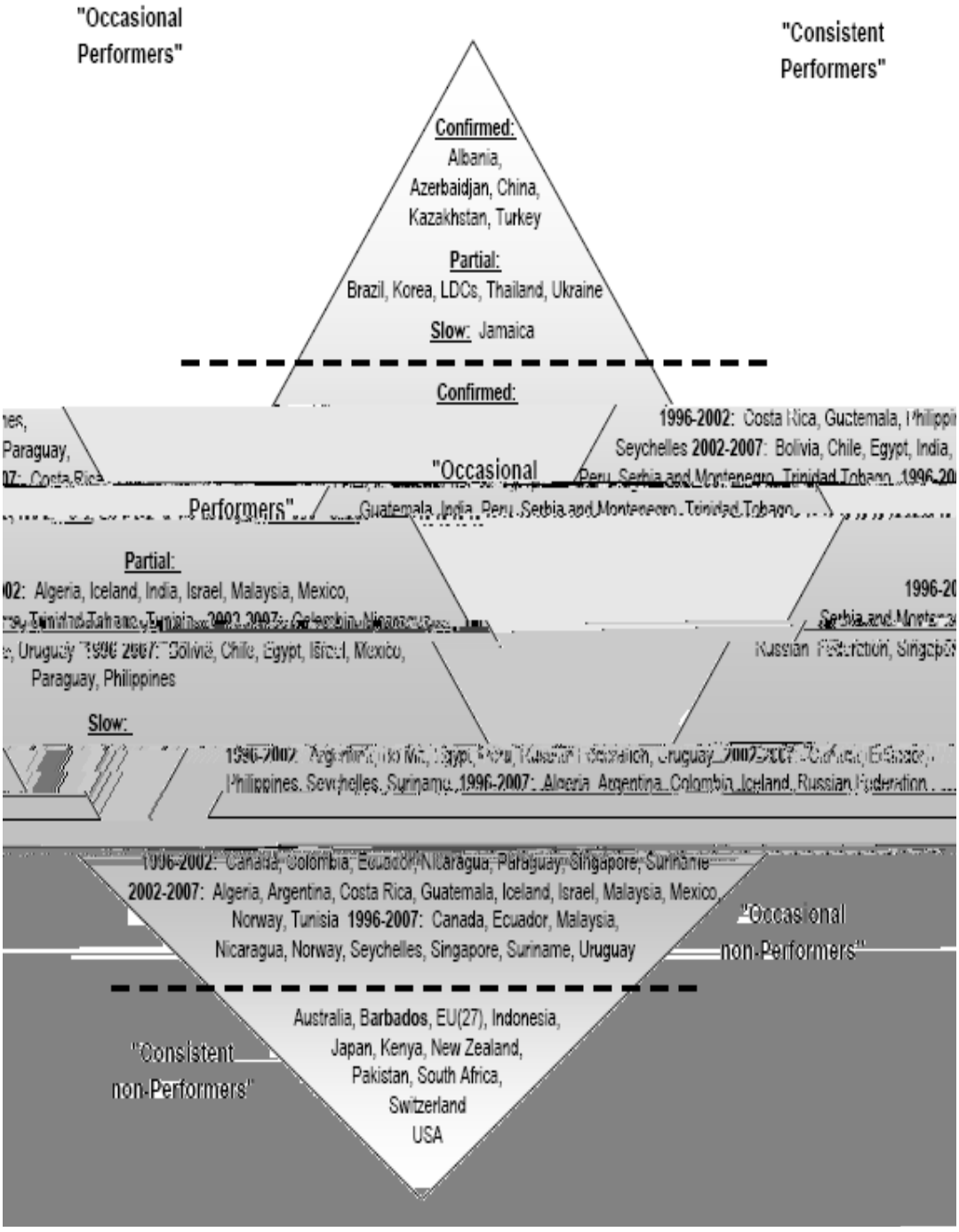
Using the more specific criteria for "Performers" mentionned previously, a complete list of all performers, consistent and occasional as well as resulting non-performers, using current prices as well as constant 2000 prices are illustrated in Diagram 2 and 3 below. Their listing of contribution shares and corresponding sectors to the change in their total exports are in Annex II Tables A5 and A6.

Diagram 2. Shift-Share Analysis: Performers and non-Performers, 1996-2007 (using current prices)



Source: Authors' calculation based on WTO Statistics and the United Nations Comtrade database.

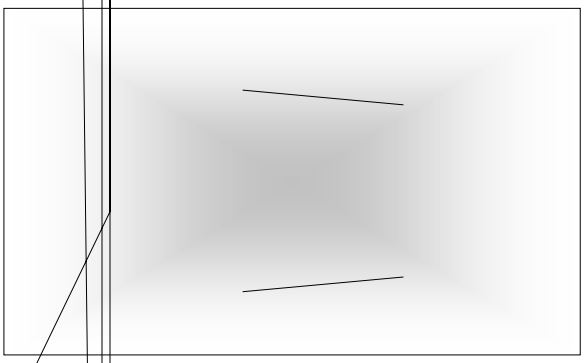
Diagram 3. Shift-Share Analysis: Performers and non-Performers, 1996-2007 (using constant 2000 prices)



Source: Authors' calculation based on WTO Statistics and the United Nations Comtrade database.

China's shift-share results show that its increase in exports is significantly attributed to its own competitiveness (Perfo = 84%, against all other effects, 16% for 1996-2002 and 63% and 27% respectively for 2002-2007). Results also indicate that the increase in total exports in both periods is mostly visible in its main exported product, manufactures. In Chart 5 below, notice also how the contribution share of the GLOBO effect almost increases by half in the period of 2002-2007.

Chart 5. China's Shift-Share Analysis of total exports, 1996-2002, 2002-2007
(Percentage, Total change=100%)

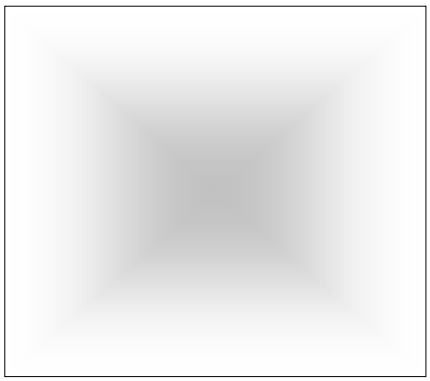


China	1996	1997	1998	1999	2000	2001	2002	2003	2004

oil prices also marked the 2002-2007 period which could be another reason for high export values for these countries. The high increase in exports from one year to the other can be attributed to price effects.

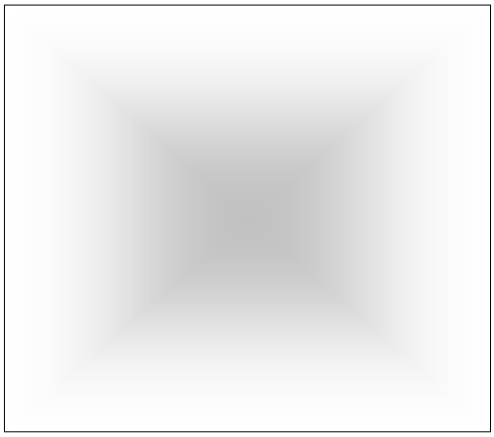
In order to isolate this effect, export values were deflated using world commodity price changes in fuels. SSA results, nevertheless, show positive and high performance indicators (PERFO) for both these countries, indicating that the recovery after the collapse of the former Soviet Union is still at work. Chart 6 below shows SSA results of CIS countries.

Chart 6. CIS oil exporters ' Shift-Share Analysis, 2002-2007, current and constant prices
(Percentage)



exports in 2002 by 25% and 22%, respectively, higher but not far from the global rate of 20%. (See Annex II Tables A3 and A4). The same trend was seen for 2002-2007 and the combined period 1996-2007. Chart 7 below shows their SSA results.

Chart 7. Korea's and Thailand's Shift-Share Analysis of change in total exports, 1996-2002, 2002-2007 (using current prices)
(Percentage)



contributor for its increase in its main exported product group, manufactures. Its PERFO effect, however, was in a sector that was not its

2% in 2007, these countries' reported share in fuels and mining products had increased from 2002 to 2007.

Among manufacture exporters, Brazil and Colombia showed positive PERFO effects primarily in manufactures. An odd observation about Brazil's results, however, is that its share in total of manufactures, dropped in manufactures in 2007 but its mining sector to which it had registered minimum but positive PERFO effects was the sector whose share in total trade had increased.

For Europe, southeastern European countries Albania, Serbia and Montenegro and Turkey continued to show positive PERFO effects. Ukraine was positive for the CIS countries, and so was South Africa for Africa. For Asia, China continued to be the frontrunner followed by India, Thailand and Korea. Singapore which showed negative PERFO results for the 1996-2002 period, this time showed positive PERFO effects. Its share in manufactures, however, does not show any increase from 2002 to 2007. Its fuels and mining sector was the sector that actually increased, also showing a positive PERFO effect.

Non-performing manufacture exporters, United States, Canada, the European Union and Switzerland, among others, continue to have lost shares in manufacture exports in this period according to the results. Consistently, their GLOBO effect had the largest contribution share in their change in total exports. (See Annex II Table A4 for GLOBO effects).

The geographical effect represents that part of the total change in exports which would have been due to the importing behaviour of the various regional partners at the global level.

In this exercise, the total geographical effect (GEO) is broken down into the effects of the 7 main regions, i.e. NA, CR6 TRE8(to3(U7.1(3(R.8(NA,)-7IS3(ons,)AF.9(g7(R. M8(to87 T5 T5(A(ons,)a[re)5.11(d8(to87 Aons,

Eight countries, 5 of which were from South and Central America had benefitted from the strong import demand from North America for agriculture products. In manufactures, 26 countries including 6 of the underperforming developed countries, the BRIC, and the 3 underperforming developing countries Kenya, Pakistan and Indonesia had also benefitted from a strong demand from NA. In the mining sector, 8 countries including the LDC group and 5 South and Central American countries benefitted from a strong import demand in the fuels and mining sector from NA. Likewise, the LDCs and 3 of the South American countries namely Colombia, Trinidad and Suriname showed positive GEO effects.

8 countries did not show their maximum GEO effect to be in NA. Four South American countries, Barbados, Paraguay, Nicaragua and Uruguay show a maximum increase in their exports by "shifting" export shares to their own region. Keny

After applying Shift Share Analysis to the 11-year Post-Uruguay Round period, the following conclusions can be made.

The 11-year period under review marked a liberalizing and recovery phase for the developing economies and economies in transition. This was a period when a number of developing countries were striving to adopt export-led growth strategies, open their markets and fulfill the domestic policy, legal and institutional reform required to be eligible for structural loans granted by multilateral or regional development banks, or to become members of the WTO after its establishment in 1995.

period, manufactures, showed to have the highest incidence of the GLOBO factor among its sectors (see Annex II Table A3) but it was in agriculture that it was able to be "competitive" (i.e. gaining market share). In the case of India in 2002-2007, the GLOBO effect showed have been the largest contributor to the increase in its main exported product, manufactures. Nevertheless, it also increased its total exports by being "competitive" in the fuels and mining sector (see Annex II Table A4). This favourable "repositioning" of the product-mix is sometimes more the effect of changes in relative prices, than an increase in exportable supply. To isolate the price effects, SSA was also applied on trade in constant prices where trends showed to be similar. As would be expected, some economies changed in performance category. For instance, the LDCs went down from being Confirmed performers to Partial performers in the 1996-2002 period, while Canada went from being a Non-performer to a Slow performer in 2002-2007 using constant prices. (see Diagrams 2 and 3 in pp. 33-34, and p.29-30 for category definitions).

- Despite the broad convergence observed among developing countries, there were differences between countries, and also fluctuations in time. Indeed, among the group of developing countries, there were only a few consistent performers. The criteria provided earlier allowed identifying 4 consistent performers, namely 1 manufacture exporter (China) and 3 oil exporters (Azerbaijan, Kazakhstan and Trinidad & Tobago). China increased its exports by 84% thanks to its own export competitivity. As for the 2 CIS countries, both also increased their exports through their own export competitivity. These countries showed very high export growth rates in their predominant exported sectors.

- In addition, a few consistent non-performers were developing countries. Most were manufacture exporters (Indonesia, Pakistan and South Africa), and one agriculture exporter (Kenya). These 4 countries barely followed the global trend to increase their total exports, most especially their respective main exported products.

- Non-oil exporting developed countries showed to have poor performance levels compared to the developing economies and countries in transition.. The developed countries conspicuously fall under the category of consistent non-performer, exhibiting, negative or almost near-zero PERFO components. Except for oil-exporting Canada and Norway, the developed countries' export growth rates were all consistently lower than the World total exports growth rate.

In most cases, the GEO and the COMPO effects are almost always in changes in total exports. This observation is important because it confirms that in the Post-Uruguay Round period (i.e. 1996-2007), the global economy experienced such structural changes that it was necessary for exporters to adapt

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This section further describes the methodology and other data issues encountered during the anaylsis.

higher a country's total exports growth rate, most likely the higher its PERFO effect and the lower its GLOBO effect

- The “decomposing” nature of this method can give an approximate idea of the relational shifts of trade, not so much on the actual quantity of the shifts, but more on where the shifts are attributed to, in what sectors of trade, or with which trading partners.
- The method is very sensitive to small values. Because it primarily works with growth rates, results using units of analysis with small numbers can produce very large growth rates and can make some results quite misleading.
- Unfortunately, this decomposing technique is not meant to provide explanations to results generated from the analysis. One can only make assumptions on why certain countries are more performant than others, why certain countries are prone not to perform as much as others, or why

Table A1. Inverse relationship between the global effect and the countries' total exports' growth rates
(Percentage)

	1996-2002			2002-2007		
Country	%	GLOBO	Country	% change	GLOBO	
A						

Table A2. Average Share of Performance Effects (PERFO) of selected economies, 1996-2007
(Percentage and share)

	% Share 2007

Table A3. Shift-Share Analysis: ALL contribution shares in change in total exports, 1996-2002 (using nominal values)
(Percentage)

Country	Main exports	1996/ 2002	PERFO	GLOBO	COMPO	GEO							
						Total	NAX	CSC	EUR	CIS	AFR	MEA	ASI	NES
Azerbaijan	MII	293	96 MI	9 MI	1 MI	5 MI	0	0	0	-5	0	1	0	0
84	93 MII	32 MII	1 MII	26 MA	0	0	2	-23	0	0	2	0	Kazakhstan	MII
105	**89 MA**	19 AG	-13 MA	5 AG	11	-6	0	0	0	0	0	0	**Guatemala**	MA
89	**88 MA**	23 AG	-18 MA	7 AG	13	-4	0	0	0	0	0	0	**Costa Rica**	MA
116	**84 MA**	18 MA	1 MA	-2 MI	3	0	0	0	0	0	-5	0	**China**	MA
0	0	0	0	0	**Albania**	MA	61	**72 MA**	33 MA	-3 MA	-2 AG	1	0	-3
[illegible]														
[illegible]														

EXPORTS GROWING THAN WORLD EXPORTS

PERFO GETTING BIGGER

EXPORTS GROWING THAN WORLD EXPORTS

PERFO GETTING SMALLER

Source: Authors' calculation based on WTO Statistics and the United Nations Comtrade database.

Countries in **bold** represent countries whose sector of maximum effect is PERFO and is also the main exports sector.
Figures in **bold** represent maximum effects.
Regions in grey represent regions with least geographical effect.
Sectors in grey represent sectors which are the same as the main exports sector.

Share in

Country	Product	Main X 2002	2002 / 1996	Share in		TOTAL CHANGE	PERFO	GLOBO 8		
				1996	2002					

Country	Product	Main X 2002	2002 / 1996	Share in 1996	Share in 2002	TOTAL CHANGE		PERFO		GLOBO		COMPO		GEO	
	MA		12	94	91	75		-66		125		19		-3	
Canada	Total	MA	25	100	100	100	MA	-47	MA	*82*	MA	-6	AG	70	MA
	AG		0	16	13	0		MA							

Table A6. Contribution shares in change in total exports of Performers and non-Performers, 2002-2007 (current prices)
(Percentage)

Country	Product	MainX 2007	2007/ 2002	Share in Total		TOTAL CHANGE	PERFO	GLOBO	COMPO	GEO
				2002	2007					

Country	Product	MainX 2007	2007/ 2002	Share in Total		TOTAL CHANGE		PERFO		GLOBO		COMPO		GEO	
				2002	2007										
Serbia M.	Total	MA	326	100	100	100	MA	*58*	MA	36	MA	1	MI	5	MA
	AG		208	27	20	17		9		10		-2		0	
	MI		252	16	13	12		1		6		6		0	
	MA		396	57	67	69		47				-3		5	
Peru	Total	MI	262	100	100	100	MI	*47*	MI	44	MI	13	MI	-4	MI
	AG		114	25	15	11		3		11		-2		-1	
	MI	MI	437	39	58	65		31		17		18		-1	
	MA		165	16	12	10		4				-1		0	
Chile	Total	MI	276	100	100	100	MI	*45*	MI	42	MI	13	MI	0	MI
	AG		108	36	20	14		3		15		-3		-1	
	MI	MI	499	40	64	72		38		17		17		1	
	MA		135	15	10	8		2				-1		0	
Partial (OP):															
Albania	Total	MA	215	100	100										

Country	Product	MainX 2007	2007/ 2002	Share in Total 2002	Share in Total 2007	TOTAL CHANGE		PERFO		GLOBO		COMPO		GEO	
	MI		18	5	3	1		-9		5		5		-1	
	MA		34	20	12	6		-15				-3		4	
Non-Performers															
Consistent (CN):															
South	Total	MA	135	100	100	100	MI	-5	AG	*86*	MA	14	MI	6	MA
Africa	AG		52	13	8	5		-4		11		-2		0	
	MI		241	27	39	48		0		23		24		1	
	MA		137	45	46	46		9				-5		4	
EU (27)	Total	MA	102	100	100	100	MA	-10	MA	*114*	MA	-9	MA	5	MA
	AG		93	10	9	9		0		11		-2		0	
	MI		214	6	9	12		-1		7		7		0	
	MA		95	83	80	77		-9				-13		5	
New Zealand	Total	AG	88	100	100	100	AG	-16	MA						

Country	Product	MainX 2007	2007/ 2002	Share in Total		TOTAL CHANGE	PERFO	GLOBO	
				2002	2007				

Table A7. PERFO contribution shares in change in total exports, by sector and region, 1996-2002 (using nominal values)
(Percentage)

Country		Share in Total		Main X	Change in Exports

Country	Product	Share in Total 1996	Share in Total 2002	2002/ 1996	Main X 2002	Change in Exports Total		Change in Exports PERFO	
Suriname	Total	100	100	10	MI	100	MI	-97	MA
	AG	23	19	-11		-25		0	
	MI	69	80	26		184		1	
	MA	2	1	-8		-1		-6	
Seychelles	Total	100	100	64	MI	100	MI	63	MI
	AG	30	12	-36		-17		-15	
	MI	22	88	558		193		182	
	MA	48	0	-100		-76		-104	
Trinidad T.	Total	100	100	51	MI	100	MI	48	MI
	AG	8	7	18		3		4	
	MI	51	60	80		79		49	
	MA	41	33	22		18		-5	
Europe:									
Norway	Total	100	100	22	MI	100	MI	4	MI
	AG	9	7	0		0		2	
	MI	62	67	32		90		17	
	MA	23	21	14		15		-9	
CIS:									
Azerbaijan	Total	100	100	243	MI	100	MI	96	MI
	AG	13	4	15		1		2	
	MI	68	90	356		99		95	
	MA	20	5	-17		-1		-3	
Kazakhstan	Total	100	100	64	MI	100	MI	93	MI
	AG	15	6	-32		-8		-1	
	MI	53	76	136		112		106	
	MA	32	15	-24		-12		-20	
Russian Fed.	Total	100	100	21	MI	100	MI	30	MI
	AG	8	8	29		11		14	
	MI	58	62	29		82		34	
	MA	30	25	1		1		-25	
Africa:									
Algeria	Total	100	100	69	MI	100	MI	64	MI
	AG	1	0	-67		-1		-1	
	MI	94	97	76		103		67	
	MA	5	2	-19		-1		-3	
Asia:									
Australia	Total	100	100	8	MI	100	MI	-20	MA
	AG	29	26	-5		-18		34	
	MI	35	40	23		98		-7	
	MA	27	24	-1					

Country	Product	Share in Total 1996	Share in Total 2002	2002/ 1996	Main X 2002	Change in Exports Total		Change in Exports PERFO	
South and Central America:									
Barbados	Total	100	100	-13	MA	100	AG	161	MA
	AG	38	31	-29		82		60	
	MI	14	23	47		-49		-35	
	MA	48	44	-21		78		146	
Guatemala	Total	100	100	105	MA	100	MA	89	MA
	AG	66	30	-7		-4		-10	
	MI	4	5	147		5		4	
	MA	31	51	243		71		67	
Costa Rica	Total	100	100	89	MA	100	MA	88	MA
	AG	72	35	-9		-7		-14	
	MI	2	2	68		2		1	
	MA	25	63	373		106		101	
Brazil	Total	100	100	26	MA	100	MA	48	AG

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Main X 2002	Change in Exports Total		PERFO		
	186		-218		
	313		-201		
MA	100	MA	48	MA	
	-2		-1		
	6		5		
	95		43		
MA	100	MA	84	MA	
	2		3		
	3		1		
	95		79		
MA	100	MA	67	MA	
	-2		-3		
	-1		-3		
	103		73		
MA	100	MA	59	MA	
	-3		-2		
	13		11		
	80		41		
MA	100	MA	32	MA	
	-13		-9		
	10		7		
	89		22		
MA	100	MA	21	MA	
	-2		0		
	11		7		
	104		29		
MA	100	MA	8	MA	
	-11		-7		
	11		-3		
	99		16		
MA	100	MA	-7	MI	
	9		11		
	19		-29		
	69		9		
MA	100	MA	-227	MA	
	-34		-31		-15

Country	Product	Share in Total		2007/	Main X	Total change			
		2002	2007	2002	2007	Total		PERFO	
Ecuador	Total	100	100	174	MI	100	MI	16	MI
	AG	49	31	71		20		-6	
	MI	41	61	305		72		20	
	MA	9							

Country	Product	Share in Total		2007/	Main X	Total change			
		2002	2007	2002	2007	Total		PERFO	
USA	Total	100	100	68	MA	100	MA	-42	MA
	AG	10	10	65		10		-3	
	MI	4	7	241		13		1	
	MA	82	78	59		72		-41	
South and Central America									
Brazil	Total	100	100	166	MA	100	MA	30	MA
	AG	32	30	152		29		10	
	MI	14	20	291		24		4	
	MA	52	47	143		44		16	
Colombia	Total	100	100	152	MA	100	MA	8	MA
	AG	25	20	101		16			

Country	Product	Share in Total 2002	Share in Total 2007	2007/ 2002	Main X 2007	Total change Total		Total change PERFO	
	MI	27	39	241		48		0	
	MA	45	46	137		46		9	
Middle East:									
Israel	Total	100	100	84	MA	100	MA	-10	MA
	AG	4	4	78		4		-1	
	MI	3	5	172		6		-2	
	MA	92	89	78		86		-10	
Asia:									
China	Total	100	100	274	MA	100	MA	63	MA
	AG	6	3	107		2		0	
	MI	4	3	209		3		-1	
	MA	90	93	288		94		63	
India	Total	100	100	195	MA	100	MA	39	MI
	AG	13	11	145		10		3	
	MI	8	24	825		33		22	
	MA	74	64	152		58		17	
Thailand	Total	100	100	126	MA	100	MA		

Table A9. Selected economies' GEO contribution shares to change in total exports, 1996-2002 (current prices)
(Percentage)

Country	Product	GEO	NA		EUR	2	,(

Country	Product	GEO		NA		CSC		EUR		CIS		AFR		MEA		ASI	
(OC)	AG	0		1		0		0		-2		0		1		0	
	MI	0		0		0		0		0		0		0		0	
	MA	-2		2		0		-1		-1		0		2		-1	
Brazil	Total	-3	MA	*19*	MA	*-16*	MA	-2	MI	-1	AG	1	AG	1	AG	-5	MA
(CP)	AG	2		5		-1		0		-1		1		1		-2	
	MI	0		1		-1		-1		0		0		0		0	
	MA	-5		12		-14		-1		0		0		0		-3	
Switzerland	Total	-3	MA	*15*	MA	-3	MA	-6	MA	0	MA	-1	MA	4	MA	-11	MA
(CN)	AG	0		0		0		0		0		0		0		0	
	MI	0		0		0		-1		0		0		0		0	
	MA	-3	1	14		-3		-6		0		-1		3		-11	
Malaysia	Total	-7	MA	*20*	MA	-1	MA	-1	MA	0	MA	0	AG	1	MA	-27	MA
(OS)	AG	-2		1		0		0		0		1		0		-4	
	MI	1		0		0		0		0		0		0		1	
	MA	-6		19		-1		-1		0		0		1		-24	

Table A9. Selected economies' GEO contribution shares to change in total exports, 1996-2002 (current prices)

Country	Product	GEO		NA		CSC		EUR		CIS		AFR		MEA		ASI	
	MA	1		4		-3		0		0		0		0		0	
Algeria	Total	-2	MI	*4*	MI	-1	MI	*-4*	MI	-1	MA	0	MI	0	MA	0	MI
(OC)	AG	0		0		0		0		0		0		0		0	
	MI	-1		4		-1		-4		0		0		0		0	
	MA	-1		0		0		0		-1		0		0		0	
Norway	Total	-8	MI	*10*	MI	-1	MA	*-15*	MI	-1	AG	0	AG	0	MA	-2	MA
(OP)	AG	-1		1		0		0		-1		0		0		0	
	MI	-4		6		0		-11		0		0		0		0	
	MA	-1		2		-1		-1		0		0		0		-1	
Bolivia	Total	-12	AG	*18*	MI	*-26*	AG	-3	MI	0	MI	0	AG	0	AG	0	AG
(CP)	AG	-9		6		-15		0		0		0		0		0	
	MI	-3		8		-8		-3		0		0		0		0	
	MA	-1		4		-4		0		0		0		0		0	
Nicaragua	Total	-64	AG	*-84*	AG	*18*	AG	2	AG	0	AG	0	AG	-1	AG	0	AG
(OS)	AG	-39		-53		13		1		0		0		-1		0	
	MI	0		-1		1		0		0		0		0		0	
	MA	-22		-27		4		1		0		0		0		0	
Azerbaijan	Total	-5	MI	0	MA	0	AG	0	MI	-5	MI	0	ALL	*1*	MI	0	MA
(CC)	AG	-1		0		0		0		-1		0		0		0	
	MI	-4		0		0		0		-4		0		1		0	
	MA	0		0		0		0		-1		0		0		0	
Ukraine	Total	-42	AG	2	MA	-1	MA	-3	MI	-38	AG	0	MA	*2*	MA	-5	MA
(CP)	AG	-18		0		0		0		-18		0		0		0	
	MI	-7		0		0		-1		-6		0		0		0	
	MA	-17		2		-1		-1		-14		0		2		-5	
Jamaica	Total	-35	MA	*-50*	MA	5	MA	*6*	MI	3	MI	-1	MI	0	AG	1	AG
(OS)	AG	-8		-10		1		0		0		0		0		1	
	MI	-8		-17		0		5		3		-1		0		0	
	MA	-19		-23		3		0		0		0		0		0	

Source: Authors' calculation based on WTO Statistics and the United Nations Comtrade database.

Note: Total GEO effects also include effects from non-specified areas which are not shown in this table.

Legend:
CC: Consistent Confirmed Performer CP: Consistent Partial Performer CS: Consistent Slow
OC: Occasional Confirmed Performer OP: Occasional Partial Performer OS: Occasional Slow Performer
CN: Consistent Non-Performer ON: Occasional Non-Performer

Grey cells indicate the region with the maximum "shift" of exports.
Grey figures indicate the region with the least "shift" in exports.
Bold and italic GEO figures indicate positive GEO effects.

Table A10. Selected economies' GEO contribution shares to change in total exports, 2002-2007 (current prices)

Country	Product	GEO		NA		CSC		EUR		CIS		AFR		MEA		ASI	
	MA	4		-2		5		0		0		0		0		0	
Argentina	Total	*5*	MA	*-5*	MA	*6*	MA	0	AG	1	AG	1	AG	1	AG	0	MI
(ON)	AG	2		-1		1		0		0		1		1		0	
	MI	-2		-2		-1		0		0		0		0		0	
	MA	5		-3		6		0		0		0		0		0	
Paraguay	Total	*5*	AG	*-1*	AG	*6*	AG	0	AG	0	AG	0	AG	0	AG	0	AG
(OC)	AG	4		0		4		0		0		0		0		0	
	MI	0		0		0		0		0		0		0		0	
	MA	1		0		2		0		0		0		0		0	
Nicaragua	Total	*1*	MA	*-10*	AG	*9*	MA	0	AG	2	AG	0	ALL	0	ALL	0	AG
(OS)	AG	1		-5		4		0		2		0		0		0	
	MI	-1		-1		0		0		0		0		0		0	
	MA	4		-1		6		0		0		0		0		0	
Chile	Total	*0*	MI	*-3*	AG	*1*	MA	0	MI	0	AG	0	MA	0	MI	1	MI
(OC)	AG	-1		-1		0		0		0		0		0		0	
	MI	1		-1		0		0		0		0		0		1	
	MA	0		-1		1		0		0		0		0		0	
Brazil	Total	*0*	AG	*-8*	MA	*3*	MA	0	AG	1	AG	1	MA	1	MI	1	MI
(CP)	AG	1		-1		0		0		1		0		0		0	
	MI	0		-1		0		0		0		0		1		1	
	MA	-2		-6		3		0		0		0		0		0	
Switzerland	Total	*4*	MA	*-7*	MA	1	MA	*3*	MA	2	MA	1	MA	2	MA	2	MA
(CN)	AG	0		0		0		0		0		0		0		0	
	MI	0		0		0		0		0		0		0		0	
	MA	4		-7		1		3		2		1		2		1	
Albania	Total	*2*	MA	*0*	MA	0	MA	*2*	MA	0	ALL	0	ALL	0	ALL	0	ALL
(OC)	AG	0		0		0		0		0		0		0		0	
	MI	0		0		0		0		0		0		0		0	
	MA	2		0		0		2		0		0		0		0	
Seychelles	Total	*172*	MI	*-2*	AG	0	ALL	0	ALL	0	ALL	1	AG	*174*	MI	-1	AG
(ON)	AG	-2		-2		0		0		0		1		0		-1	
	MI	174		0		0		0		0		0		174		0	
	MA	0		0		0		0		0		0		0		0	
India	Total	*5*	MA	*-5*	MA	0	MA	0	MA	2	MA	1	MA				

Country	Product	GEO	NA

Table A11. Selected economies' COMPO contribution shares to change in total exports, 1996-2002 (current prices) (Percentage)

CAT	Country	Product	Share in 1996	Share in 2002	2002/1996	Main X 2002	TOTAL		COMPO	
Effects in Agriculture										
OS	Paraguay	Total	100	100	-9	AG	100	AG	*200*	AG
		AG	82	85	-7		58		206	
		MI	1	1	-15		1		-1	
		MA	17	15	-22		40		-6	
OS	Nicaragua	Total	100	100	-15	AG	100	MA	*93*	AG
		AG	64	69	-8		35		100	
		MI	2	5	185		-19		-1	
		MA	33	20	-49		109		-7	
ON	Uruguay	Total	100	100	-22	AG	100	AG	*59*	AG
		AG	62	61	-23		64		65	
		MI	2	1	-44		3		-1	
		MA	36	36	-22		35		-5	
OS	Barbados	Total	100	100	-13	MA	100	AG	*49*	AG
		AG	38	31	-29		82		67	
		MI	14	23	47		-49		-7	
		MA	48	44	-21		78		-11	
OS	Jamaica	Total	100	100	-20	MI	100	MA	*7*	AG
		AG	24	22	-24		29		28	
		MI	50	67	7		-17		-17	
		MA	26	9	-71		94		-4	
ON	EU (27)	Total	100	100	17	MA	100	MA	-1	AG
		AG	11	10	*-2*		-2		-16	
		MI	5	6	24		8		2	
		MA	80	83	20		94		14	
ON	Indonesia	Total	100	100	19	MA	100	MA	-2	AG
		AG	17	16	*10*		9		-21	
		MI	32	30	12		19		11	
		MA	51	54	25		69		8	
OS	Malaysia	Total	100	100	20	MA	100	MA	-2	AG
		AG	14	10	-16		-11		-16	
		MI	9	9	23		11		3	
		MA	76	80	26		99		11	
OC	Albania	Total	100	100	*61*	MA	100	MA	-3	AG
		AG	20	10	-22		-7		-8	
		MI	15	5	-42		-10		2	
		MA	65	81	102		108		3	
OC	Turkey	Total	100	100	*56*	MA	100	MA	-4	AG
		AG	21	11	-21		-8		-9	
		MI	4	4	44					

CAT	Country	Product	Share in		2002/	Main X	T
			1996	2002	1996	2002	

CAT	Country	Product	Share in 1996	Share in 2002	2002/ 1996	Main X 2002	TOTAL		COMPO	
OS	Argentina	Total	100	100	8	AG	100	MI	-140	AG

CAT	Country	Product	Share in		2002/	Main X	
			1996	2002	1996	2002	

Table A12. Selected economies' COMPO contribution shares to change in total exports, 2002-2007 (current prices)
(Percentage)

CAT	Country	Product	Share in		2007/	Main
			2002	2007	2002	

CAT	Country	Product	Share in 2002	Share in 2007	2007/ 2002	Main 2007	Total		COMPO	
		AG	7	3	53		1		-1	
		MI	60	69	*344*		72		25	
		MA	33	28	235		27		-2	
CC	Kazakhstan	Total	100	100	*394*	MI	100	MI	*22*	MI
		AG	6	3	164		3		0	
		MI	76	84	*449*		86		23	
		MA	15	11	255		10		-1	
OC	LDCs	Total	100	100	*155*	MI	100	MI	*21*	MI
		AG	20	13	57		7		-3	
		MI	41	64	*296*		79		28	
		MA	35	22	65		15		-3	
OC	Colombia	Total	100	100	*152*	MA	100	MA	*21*	MI
		AG	25	20	101		16		-4	
		MI	37	39	165		40		29	

CAT	Country	Product	Share in 2002	Share in 2007	2007/ 2002	Main 2007	Total		COMPO	
		MA	14	27	310		38		-2	
CP	Ukraine	Total	100	100	*174*	MA	100	MA	*4*	MI
		AG	15	14	154		13		-2	
		MI	18	11	76		8		12	
		MA	66	72	200		76		-6	
OC	Serbia &	Total	100	100	*326*	MA	100	MA	*1*	MI
		AG	27	20	208		17		-2	
		MI	16	13	*252*		12		6	
		MA	57	67	396		69		-3	
Effects in Manufactures										
CP	Brazil	Total	100	100	*166*	MA	100	MA	0	MA
		AG	32	30	152		29		-5	
		MI	14	20	291		24		10	
		MA	52	47	*143*		44		-5	
ON	Tunisia	Total	100	100	*119*	MA	100	MA	-2	MA
		AG	7	10	210		12		-1	
		MI	11	20	289		27		11	
		MA	82	71	89		61		-11	
OC	Singapore	Total	100	100	*139*	MA	100	MA	-3	MA
		AG	3	2	76		1		0	
		MI	9	15	320		20		8	
		MA	85	77	*119*		72		-10	
OC	India	Total	100	100	*195*	MA	100	MA	-4	MA
		AG	13	11	145		10		-2	
		MI	8	24	825		33		5	
		MA	74	64	*152*		58		-6	
CC	China	Total	100	100	*274*	MA	100	MA	-4	MA
		AG	6	3	107		2		0	
		MI	4	3	209		3		2	
		MA	90	93	*288*		94		-5	
ON	Mexico	Total	100	100	69	MA	100	MA	-4	MA
		AG	6	6	75		6		-2	
		MI	10	18	209		30		17	
		MA	84	75	51		62		-20	
OC	Albania	Total	100	100	*215*	MA	100	MA	-5	MA
		AG	10	9	184		8		-1	
		MI	5	14	726		18		3	
		MA	81	71	*173*		65		-6	
ON	Malaysia	Total	100	100	87	MA	100	MA	-5	MA
		AG	10	12	125		14		-3	
		MI	9	16	212		23		13	
		MA	80	71	67		61		-15	
OC	Turkey	Total	100	100	*197*	MA	100	MA	-6	MA
		AG	11	10	168		9		-1	
		MI	4	7	467		9		2	
		MA	83	81	*191*		80		-7	
CP	Korea	Total	100	100	*129*	MA	100	MA	-7	MA
		AG	2	2	63		1		0	
		MI	5	9	290		12		5	
		MA	92	89	*122*		87		-12	
ON	EU (27)	Total	100	100	102	MA	100	MA	-9	MA
		AG	10	9	93		9		-2	
		MI	6	9	214		12		7	
		MA	83	80	95		77			

CAT	Country	Product	Share in 2002	Share in 2007	2007/ 2002	Main 2007	Total		COMPO	
CP	Thailand	Total	100	100	*126*	MA	100	MA	-10	MA
		AG	18	16	101		15		-3	
		MI	4	6	271		8		4	
		MA	75	76	*129*		77		-10	
ON	Israel	Total	100	100	84	MA	100	MA	-15	MA
		AG	4	4	78		4		-1	
		MI	3	5	172		6		4	