UNITED NATIONS UNIVERSITY

UNU-WIDER
World Institute for Development Economics Research

Research Paper No. 2008/81

Comparative Advantage Patterns and Domestic Determinants in Emerging Countries

An Analysis with a Focus on Technology

Daniela Marconi and Valeria Rolli*

September 2008

Abstract

During the last two decades a number of emerging economies have become deeply engaged in technology-intensive production. This has been reflected in their international trade specialization shifting from labour-intensive goods towards capital-intensive ones, and in rapid productivity gains across all manufacturing activities. The paper investigates for a sample of sixteen emerging countries, the linkages between the pattern of revealed comparative advantages (RCAs), captured by a modified version of the Lafay index of international trade specialization, and the competitiveness structure of the domestic manufacturing sector, measured by a set of industry and country-specific variables. Positive and large RCAs are found to be associated with low unit labour costs in both low-technology (high labour-intensive) and medium- or high-tech sectors. On the other hand, domestic accumulation of physical capital is associated with positive and large RCAs in medium- or high technology sectors. The international disadvantage (negative RCAs) in technology-intensive production tends to deepen for countries with low human capital, whereas it diminishes for countries with large domestic markets importing technology through foreign capital goods.

Keywords: revealed comparative advantages, technological up-grading

JEL classification: F14, O10

* Economic Research Department, Bank of Italy, Rome, emails: daniela.marconi@bancaditalia.it (D. Marconi) and valeria.rolli@bancaditalia.it (V. Rolli)

This study has been prepared within the UNU-WIDER project on the Southern Engines of Global Growth, co-directed by Amelia Santos-Paulino and Guanghua Wan..

UNU-WIDER acknowledges the financial contributions to the research programme by the governments of Denmark (Royal Ministry of Foreign Affairs), Finland (Ministry for Foreign Affairs), Norway (Royal Ministry of Foreign Affairs), Sweden (Swedish International Development Cooperation Agency—Sida) and the United Kingdom (Department for International Development).

ISSN 1810-2611 ISBN 978-92-9230-135-4

Acronyms

ISIC	international standard industrial classification
NAFTA	North American Free Trade Agreement
PPP	purchasing power parity
RCAs	revealed comparative advantages
SITC	standard international trade classification
UNIDO	United Nations Industrial Development Organization
WTA	World Trade Analyzer

UNU World Institute for Development Economics Research (UNU-WIDER)
Katajanokanlaituri 6 B, 00160 Helsinki, Finland

Typescript prepared by Liisa Roponen at UNU-WIDER

1 Introduction

Over the last two decades a number of emerging economies have improved their technical capabilities and engaged in more technology-intensive production that had previously been confined only to producers in advanced countries. Accumulation of physical capital, learning processes, access to foreign technology and to international networks of production are likely to have all played some role in explaining this process of technological catching-up.

This new feature of international competition has been reflected in changes in the structure of international trade of the emerging countries. Their tendency to shift international specialization away from labour-intensive production and to diversify into more capital- and technology-intensive activities has been confirmed in a number of empirical studies, most of which have adopted an approach à la Balassa and looked at the evolution of normalized export shares over the last quarter century (see, for example, Basili, Epifani and Helg 2000; Lall 2000; Mayer, Butkevicius and Pizarro 2003; Rolli and Zaghini 2003).

Evidence of improved international competition in emerging countries has also been borne out by their achieving large long-term gains in labour productivity across all manufacturing activities, with some indications of faster catching-up in the more technology-intensive industries (see Landesmann and Stehrer 2001; Stehrer and Wörz 2003).

Although quite interrelated, those two aspects of international competition—the one captured by the pattern of international trade specialization and the other by the cost competitiveness structure of the domestic manufacturing sector—have not been jointly analysed very often in the literature, in particular with regard to empirical research focused on the emerging countries.[1]

This paper tries to fill in this gap by investigating for a group of emerging countries with large and diversified manufacturing sectors, the empirical linkages between the pattern of international trade specialization and, as a major driving factor the competitiveness structure of the domestic productive sector. The main issue addressed in the paper is the identification of the characteristics of the domestic manufacturing sector that in terms of cost structure and technical capabilities are more conducive to the development of internationally viable production in technology-intensive sectors.

Another area where the paper tries to improve on earlier contributions is in measuring more precisely the pattern of international trade specialization in emerging countries and its changes over the last two decades. Available analyses are mostly based on the pattern of (normalized) export shares and they may be biased in the presence of internationally fragmented production chains. Instead, we use a modified version of the Lafay index, which is based on net trade flows. Due to a dramatic reduction in telecommunication (and, to a less degree, transport) costs and to financial liberalization worldwide, international fragmentation of production has become a dominant feature in manufacturing, leading to a growing share of intermediate goods (such as parts and

1 In Leamer (1997) and Montobbio (2003) these interrelations are tentatively analysed for the advanced countries.

components) in emerging countries' imports. As imported inputs are assembled into final goods and then re-exported, the actual value added realized by the domestic sector should be computed by netting export values of the imported inputs.[2]

The growing integration of emerging economies into the world trade has spurred the revival of theoretical trade models along the lines of international specialization based on cost advantages. The literature on trade and growth has emphasized the dynamic and endogenous nature of Ricardian absolute and comparative advantages (e.g., Grossman and Helpman 1991; Krugman 1986, 1987; Young 1991). Endogenous technological innovation can lead either to persistence or mobility of international specialization, depending on the scope of technological spillovers. If technical change, learning-by-doing and knowledge spillovers are sector and/or country specific, we would observe persistence and agglomeration, whereas if knowledge dissemination takes place to some extent across industries and countries, then specialization could (but will not necessarily) exhibit mobility over time.

The so-called 'new economic geography' literature has been built around the idea that the size of a country and its geographic characteristics might have important effects on its specialization and convergence/divergence patterns, by shaping the scope of its 'spatial interactions' in labour and product markets (Venables 2006). The possibility of operating in large labour markets and easily accessing sizeable product markets might enhance country productivity through reducing search- and transaction costs by facilitating knowledge spillovers and the exploitation of economies of scale. Large labour and product markets also allow greater diversification of production (Krugman 1980; Krugman 1991; Grossman and Helpman 1991).

Traditional trade theory has not only ignored agglomeration factors and economies of scales, but it has also dealt with final products. The more recent contributions, drawing on increasing evidence, have brought forth models that incorporate trade in intermediate goods. The international fragmentation of production, by relocating the various stages of production to sites where the costs are lowest, tends to reinforce and amplify the scope of Ricardian comparative and absolute advantage (Arndt and Kierzkowski 2001). And, indeed, if each production stage has a different factor intensity, then, by having the most labour-intensive phases, for instance, relocated to labour-abundant countries, the Hecksher-Ohlin type of argument could be reinforced as well. In the presence of increasing returns to scale, the economic incentives promoting the international fragmentation of production extend further, as argued by Jones and Kierzkowski (2004).

Our sample includes sixteen large manufacture exporters among the emerging countries (Table 1), each of which holds a share of world manufacture exports over 0.4 per cent. Their overall weight on world trade is about 25 per cent. Manufactures account for a relatively large share of their total exports (between 54 and 95 per cent). The countries are globally dispersed, albeit those in East Asia (eight out of sixteen) clearly outnumber the others. Our sample is also quite diverse with regard to both the stage of economic development (per capita annual incomes between US$2,500-24,000) and the economic growth achieved in the sample period (average annual rates between -0.1 and +8.2 per

---

2 As an alternative to the Lafay index, we could have used an indicator of international specialization based on (normalized) domestic value added shares. However, detailed and internationally comparable statistics on domestic value added are not easily available for emerging countries.

cent in 1986-2001). Our sample covers about 80 per cent of the trade flows of emerging countries, and thus provides valuable insights on their pattern of international competition.

The paper is organized as follows. In section 2 we analyse the pattern of international trade specialization for our sample countries across the 1985-2001 period. Revealed comparative advantages (RCAs) are computed by a modified version of the Lafay index over 182 manufacture products and then aggregated over large sectors. In section 3 we set up our empirical specification, where RCAs in international trade are determined by a set of industry and country-specific competitiveness factors. We then test the model and run a panel-data econometric exercise covering 28 broad manufacturing activities over the years 1985-2000 across our sample countries. In order to discriminate statistically between activities with different technological requirements, traded goods and manufacturing industries are classified as either low- or medium- and high technology-intensive, according to the broad characteristics of the production processes and the importance of R&D activities carried out by US firms. In section 4 we draw our conclusions.

Table 1
Major manufacture exporters among the emerging countries

			Percentage share of manufactures in exports of goods		Per capita income	
	Percentage share of world exports of manufactures, 2001	Annual percentage change in manufactures exports (current $) 1985-2001	1985	2001	PPP $, 2001	Annual percentage change (constant $), 1986-2001
China	5.2	21.9	41.5	88.8	4,649	8.2
South Korea	3.0	10.4	91.3	90.7	16,046	6.0
Mexico	3.0	17.2	39.8	85.2	8,991	1.0
Taiwan	2.6	9.4	90.3	94.7	21,966	5.7
Singapore	2.3	14.6	55.0	88.0	23,218	4.5
Malaysia	1.6	19.3	27.2	80.9	8,912	3.8
Thailand	1.1	19.7	38.6	76.8	6,410	4.8
India	0.7	12.1	58.2	77.0	2,537	3.6
Indonesia	0.7	18.6	11.0	56.4	3,525	3.2
Brazil	0.7	6.6	44.1	54.9	7,541	0.8
Philippines	0.6	16.3	56.7	91.2	4,022	1.2
Poland	0.6	9.1	63.9	80.8	10,384	2.6
Israel	0.6	10.9	83.4	94.6	21,308	2.0
Hungary	0.6	9.9	68.0	87.0	13,601	1.3
Turkey	0.6	11.0	61.1	82.1	6,134	2.0
South Africa	0.4	11.7	42.4	72.3	10,065	-0.1
Memorandum item:						
Industrial countries	69.7	7.9	75.5	83.0	28,213	2.2
Emerging countries	30.3	11.4	39.6	66.5	4,341	2.9

Source: Elaborations based on IMF and WTO data.

2 International trade specialization

2.1 Methodology

International trade classification by technology-intensity. Starting from export and import values disaggregated at 3-digit codes (SITC-Rev. 2 classification), we have excluded the non-manufactures as well as those products classified as residuals.[3] The resulting 182 products are clustered into the following three large groups, according to the taxonomy in Lall (2000), which is based on factor-intensity, technical complexity and other characteristics of the production process:[4]

i) Resource-based and low-technology (LT): agro-based and other resource-based, textiles, garments and footwear and other labour-intensive manufactures;

ii) Medium-technology (MT): automotive, process and engineering manufactures;

iii) High technology (HT): electronic and electrical and other technology-intensive manufactures.

The above groups are ranked by increasing technological intensity, from low-tech to medium- and high-tech products.[5] In the following analysis we also gather products belonging to the second and third groups into a single large class encompassing all medium- and high-technology products (MHT).

The Lafay index of international trade specialization. As vertical fragmentation of production has become a dominant feature of manufacturing activities around the world, it is appropriate to use an indicator of RCAs that is able to some extent to control for the import-intensity of exports. Cheap-labour emerging economies, in fact, tend to import technologically sophisticated components, perform low value-added assembling activities and subsequently re-export valuable final goods on which their contribution has been minimal. Contrary to the traditional Balassa (1966) index, which takes only export shares into account, the Lafay (1992) index is based on net trade flows and is therefore more suitable to deal with the problem of fragmented production.

In the paper we use a modified version of the Lafay (1992) index taken from Bugamelli (2001):

$$LA_i^c = \left[\frac{x_i^c - m_i^c}{m_i^c + x_i^c} - \frac{\sum_{i=1}^{n} x_i^c - \sum_{i=1}^{n} m_i^c}{\sum_{i=1}^{n} x_i^c + \sum_{i=1}^{n} m_i^c} \right] * \frac{m_i^c + x_i^c}{\sum_{i=1}^{n} x_i^c + \sum_{i=1}^{n} m_i^c} * 100$$

3 'Residuals' collect flows which have not been assigned to any specific product category and are therefore not easily associated with any technological content. For some years and countries (such as Hungary and China) residuals account for a significant share of trade and their exclusion, therefore, may potentially impinge negatively on the reliability of our analysis (see Appendix 1).

4 See Appendix 2 for a full list of the 3-digit SITC codes included in each product group.

5 It is quite possible that trade flows of rather different technical complexity may be recorded under the same technological product group, a problem which tends to be larger when starting from a low degree of basic product disaggregation. As regard to our analysis, a finer (than 3-digit) product classification was not available for all sample countries nor for a feasible number of years.

where x_i^c and m_i^c are total exports and imports of product i by country c and the sums over the n products are total manufacture exports and imports.

The Lafay index is a measure of the contribution of each product i to the overall trade balance of country c (the trade surplus/deficit in product i is adjusted for the overall trade balance of country c and then weighted by the share of product i on overall two-way trade of country c). Therefore, it sums up to zero across all products, regardless of any global imbalance between country c's total exports and imports:

$$\sum_{i=1}^{n} LA_i^c = 0$$

If the Lafay index LA_i^c is positive (negative), then country c has a revealed comparative advantage (disadvantage) in product i. The absolute value of the index measures the intensity of the advantage (disadvantage) of country c in product i. One additional desirable property of the Lafay index is that it can vary between -50 (full despecialization) and +50 (full specialization); these limit-values can only be reached if the overall trade balance is nil.[6]

Based on the elementary indexes LA_i^c, we have computed three synthetic indicators of a country's pattern of trade.

Trade technological intensity. In order to measure the intensity of a country's RCA in a given product group J (where $J = LT, MT, HT, MHT$), we take the arithmetic sum of the elementary Lafay indexes overall the n_J products included in class J:

$$LAFAY_C\,(J) = \sum_{i=1}^{n_J} LA_i^c$$

Being an arithmetic sum, this measure may subtend either a uniform advantage/disadvantage overall the products belonging to class J or a highly dispersed structure across the individual products, with positive and negative elementary LA_i^c averaging out. The higher the value of the indicator $LAFAY_C(MHT)$, the higher a country *average* RCA in medium- and high-tech products and the higher its position in the technological ladder.[7]

---

6 It may be worthwhile to note that the Lafay index is *neutral* with respect to the degree of basic product disaggregation of the underlying trade flows (in fact the sum of the Lafay indexes is equal to the Lafay index of the sum of the trade flows). This is obvious from the following (equivalent) formulation, where LA_i^c is shown to be linear on x_i and m_i:

$$LA_i^c = 2\frac{x_i^c \sum_{i=1} m_i^c - m_i^c \sum_{i=1}^{n} x_i^c}{\left(\sum_{i=1}^{n} x_i^c + \sum_{i=1}^{n} m_i^c\right)^2} * 100$$

7 You may notice that the $LAFAY_C$ (J) index, being a linear transformation of the elementary Lafay index, is also neutral with respect to the degree of basic product disaggregation of the underlying trade flows.

Trade polarization and dissimilarity with respect to G7 countries' trade. When analysing a country's trade structure, it is also important to consider the *dispersion* of its RCAs across products or sectors. This provides, in fact, a synthetic measure of the country's overall degree of trade specialization. Intuitively, the more a country's production structure tends to be concentrated in few sectors, the larger and more dispersed are its sectoral trade imbalances.

To capture this feature of a country's trade structure, we compute two indicators. The first one is a 'polarization' index, which is calculated by summing up the positive values of the elementary Lafay indexes across all products:

$$P_C = \sum_{i=1}^{n} LA_i^c$$

where: $LA_i^c = LA_i^c$ *if* $LA_i^c > 0$ and $LA_i^c = 0$ *otherwise.*

The higher the value of the above sum, the higher the degree of polarization (note that: $0 \leq P_C \leq 50$).[8]

The second is a 'dissimilarity' index, where we take the G7 trade specialization patterns as benchmark and we compute the distance between a country's trade structure and that for the G7 countries' aggregate:

$$D_C = \sum_{i=1}^{n} | LA_i^c - LA_i^{G7} |$$

Note that: $0 \leq D_C \leq 100$.

2.2 Results

Trade technological intensity. As described earlier, the index $LAFAY_C$ (*MHT*) measures a country's *average* RCA in medium- and high-tech products and is therefore taken as a synthetic indicator of trade technological intensity. In Table 2 we rank our sample countries on the basis of their RCAs in MHT, MT and HT sectors. For the sake of analysis, we also split the HT sector into subsectors HT1 (electronic and electrical products) and HT2 (other high-tech products).[9] Based on more recent figures (average

8 You may notice that the value of the index PC is neutral with respect to the degree of basic product disaggregation. Alternative measures of dispersion (such as those based on quadratic forms) do not share the same property.

9 More detailed (nine) classes are also proposed in Appendix 3, as follows (J codes in parentheses):

MANUFACTURES		
Low-tech (LT)	Medium-tech (MT)	High-tech (HT)
Resource based:	- Automotive (MT1)	- Electronic and electrical (HT1)
- Agro-based (RB1)	- Process (MT2)	- Other (HT2)
- Other (RB2)	- Engineering (MT3)	
Labor-intensive:		
- Textiles, garments & footwear (LT1)		
- Other (LT2)		

of the 1999-2001 trade flows), only four countries (Mexico, the Philippines, Hungary and South Korea) show a positive value for the $LAFAY_C\,(MHT)$ index, which means that they are no longer internationally disadvantaged in the medium- and high-tech production. On the other hand, the large majority of the sample countries still exhibit a comparative disadvantage (a negative LAFAY index) in the MHT sector, which is quite substantial in the case of South Africa, Turkey, Brazil and India.

With regard to the sample countries at the bottom of Table 2, it is obvious that Brazil and South Africa are still highly specialized in natural resource-intensive products, while India and Turkey tend to specialize in low-tech labour-intensive goods (see Appendix 3).

As the table shows, five of the eight best-placed countries (top-half of the sample) are located in East Asia and the relatively high technological intensity of their trade partly reflects strong specialization in electronic and electrical goods (HT1 product group). As a matter of fact, the HT1 column in Table 2 shows a higher frequency (ten out of sixteen cases) of positive values for the LAFAY index than the other product-group columns, and this occurs in most cases for countries located in East Asia; China is the only sample country in the region with a negative value for $LAFAY_C(HT1)$. On the other hand, only two countries (South Korea and Mexico) display a positive LAFAY index in medium-tech intensive (MT) goods, which in both cases results from specialization

Table 2
Emerging countries ranked by their RCAs in medium-high technology products
(values of he $LAFA_{\,c}(J)$ indexes in 1999-2001 and correspond country rankings 'R')

Country code	Country	Technological product group 'J'								Memo items	
		J=MHT	R	J=MT	R	J=HT1	R	J=HT2	R	D_C	P_C
MEX	Mexico	3.4	1	0.8	2	2.9	6	-0.4	2	48.0	18.4
PHL	Philippines	2.9	2	-7.3	13	11.4	1	-1.2	7	52.4	23.5
HUN	Hungary	0.7	3	-0.7	3	2.4	8	-1.0	3	45.0	17.1
KOR	South Korea	0.2	4	3.0	1	0.3	10	-3.2	14	47.1	18.9
SGP	Singapore	0.0	5	-4.4	6	6.0	2	-1.6	10	31.5	11.1
TWN	Taiwan	-2.0	6	-2.7	4	4.7	3	-4.0	16	46.3	21.6
MYS	Malaysia	-3.0	7	-4.8	7	2.9	7	-1.1	6	50.6	19.0
ISR	Israel	-3.6	8	-6.3	10	2.9	5	-0.3	1	41.7	17.9
THA	Thailand	-6.5	9	-5.4	8	0.9	9	-2.0	11	53.7	21.4
POL	Poland	-8.5	10	-3.4	5	-2.6	11	-2.5	12	47.0	19.5
IDN	Indonesia	-11.0	11	-13.7	16	3.8	4	-1.0	4	66.2	33.6
CHN	China	-11.6	12	-7.6	14	-2.6	12	-1.3	9	61.7	25.7
IND	India	-13.5	13	-7.0	12	-5.2	14	-1.2	8	61.6	26.6
BRA	Brazil	-13.6	14	-5.4	9	-7.1	15	-1.1	5	56.0	25.0
TUR	Turkey	-17.2	15	-9.7	15	-4.8	13	-2.7	13	44.0	28.3
ZAF	South Africa	-17.4	16	-6.6	11	-7.1	16	-3.7	15	61.1	28.3
Memorandum item:											
G7 countries		4.4	-	4.0	-	-0.8	-	1.2	-	0.0	7.4
Of which											
United States		5.1	-	0.8	-	1.0	-	3.3	-	20.5	14.2
Japan		13.2	-	13.0	-	0.7	-	-0.5	-	32.4	20.6
Germany		6.0	-	8.2	-	-3.0	-	0.9	-	14.9	11.0

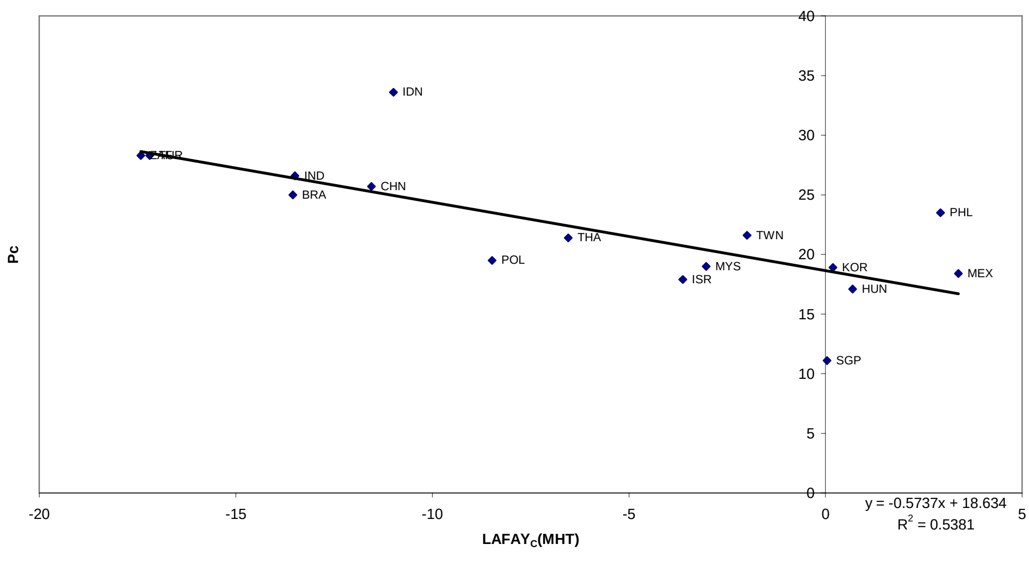
Source: Elaboration of WTA data.

in the automotive sector (see subgroup MT1 in Appendix 3). The fact that quite a significant number of heavy-weight exporters among emerging countries have specialized in tech-intensive electronic goods has brought about a parallel despecialization away from this sector in the overall trade structure of the G7 countries, as shown by the negative values of their $LAFAY_C(HT1)$ in Table 2.

It is a rather established empirical fact that countries at an early stage of industrialization tend to concentrate their export capabilities on a few productions with very simple technological requirements and, only as their economies mature, do they manage to diversify into a wider array of manufactures that require more complex technologies. As this pattern also tends to emerge across countries at different stages of economic development, we investigate the empirical linkages between different indicators of trade structure using our sample of emerging countries. The sample is quite appropriate, as the across-countries differences in per capita income—a good proxy of the development stage—are quite wide (see Table 1).

We find a significant negative linear correlation between our indicator of trade technological intensity ($LAFAY_C$ (MHT)) and the index of trade polarization P_C (see Figure 1). This result may be explained on the basis of our previous finding that the RCAs in a majority of emerging countries in our sample are still quite concentrated in low-tech intensive goods.[10] We also trace a negative, albeit weaker, linear correlation between our indicator of trade technological intensity and the index of trade dissimilarity Dc, which is inversely proportional to the extent of product overlap with the G7 countries' trade structure (see Figure 2).[11]

Figure 1. Linear correlation between trade technological intensity (LAFAY$_C$(MHT) and trade polarization (Pc) (1999-2001 period)



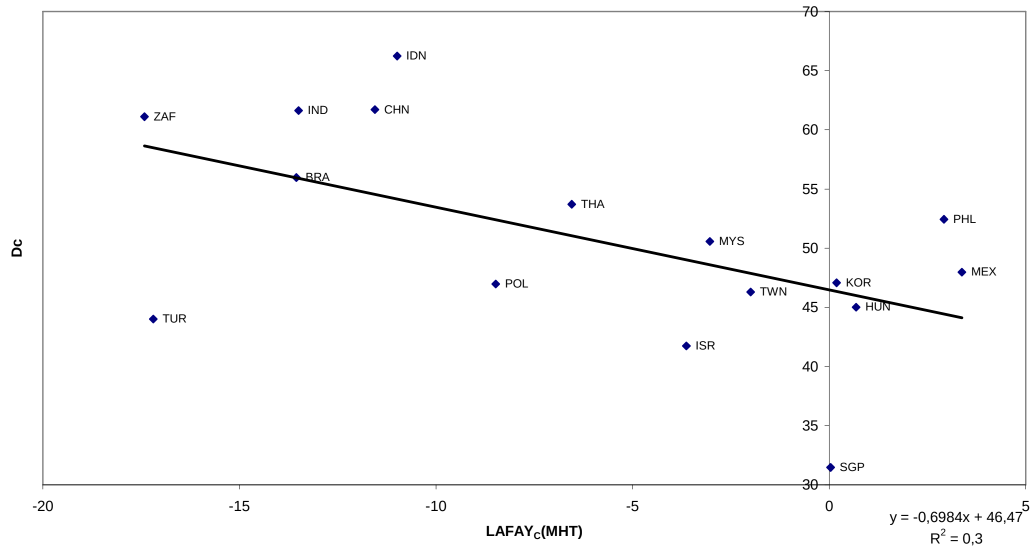
Source: Authors' elaborations on WTA data.

---

[10] The Philippines, Indonesia and Singapore appear to be outliers in Figure 1. Notice, in particular, the Philippines' relatively high specialization in HT1 trade and Singapore's (Indonesia) low (high) degree of trade polarization.

[11] In Figure 2 Turkey is a clear outlier, as its degree of product overlap with G7 trade is relatively high, given the low tech-intensity of its trade.

Figure 2. Linear correlation between trade technological intensity ($LAFAY_C(MHT)$) and trade dissimilarity with respect to G7countries (Dc) (1999-2001 period)



Source: Authors' elaborations on WTA data.

This result is quite consistent with Table 2, where the overall trade structure of the G7 countries is shown to be more diversified and at the same time relatively skewed towards the medium- and high-tech production.

Trade technological intensity from a dynamic perspective. The pattern of international trade specialization indicated in Table 2 may reflect the different stages of economic development of the sample countries and it does not provide any information on its dynamics. To evaluate long-term technological changes, we have computed the following difference index:

$$Delta\_LAFAY_C(J) = LAFAY_C(J)_{(1999\text{-}2001)} - LAFAY_C(J)_{(1985\text{-}1987)}$$

where J refers, as before, to a given product class and the subscripts in brackets stand for the years to which average trade flows belong.

We now rank our sample countries by their long-term gains in trade technological intensity, as measured by the values of the $Delta\_LAFAY_C$ indexes in MHT, MT, HT1 and HT2 sectors (see Table 3). It is worth noting that trade technological upgrading has been a rather widespread tendency among our sample countries over the last two decades, albeit with varying intensity. All countries except Poland display, in fact, a positive value of the index $Delta\_LAFAY_C(MHT)$. At the same time, the outcome is very skewed in favour of East Asia, which accounts for seven of the eight best performer countries (top-half of the table). Among the non-Asian countries, Mexico is the only one retaining a distinguished (third) position. Looking at more detailed product groups, technological improvement has been frequently reflected as positive developments in MT and HT1 sectors, whereas the HT2 sector has been the most difficult one for emerging countries to compete in. As regards to the latter sector, there has been a further retrocession in six out of sixteen countries, as shown by negative values for $Delta\_LAFAY_C(HT2)$.

Table 3
emerging countries ranked by their long-term gains in RCAs in medium-high products
(values of he Delta_$LAFAY_C(J)$ indexes and corresponding country rankings 'R')

		Technological product group 'J'								Memorandum items *LAFAYc*(*MHT*)			
Country code	Country	J=MHT	R	J=MT	R	J=HT1	R	J=HT2	R	1985-87	1999-2001	Delta_ D_c	Delta_ P_c
PHL	Philippines	19.6	1	7.0	7	11.3	1	1.3	4	-16.6	2.9	-30.5	-16.7
IDN	Indonesia	17.0	2	8.1	2	7.5	3	1.3	3	-28.0	-11.0	-25.5	-5.8
MEX	Mexico	11.9	3	2.0	13	8.3	2	1.6	2	-8.5	3.4	-17.2	-8.6
THA	Thailand	11.2	4	6.4	9	3.5	7	1.3	5	-17.7	-6.5	-26.0	-14.2
MYS	Malaysia	11.1	5	7.2	5	3.2	8	0.7	7	-14.1	-3.0	-13.4	-8.7
TWN	Taiwan	9.7	6	5.2	10	6.5	4	-0.2	13	-11.7	-2.0	-15.7	-4.1
CHN	China	8.8	7	7.1	6	1.7	10	0.0	9	-20.4	-11.6	-11.0	-4.9
KOR	South Korea	8.4	8	7.6	4	1.3	11	-0.6	12	-8.2	0.2	-19.6	-9.5
HUN	Hungary	7.1	9	9.6	1	2.3	9	-4.7	16	-6.5	0.7	-10.8	-6.0
IND	India	6.1	10	6.9	8	-1.8	15	1.1	6	-19.6	-13.5	-16.0	-6.8
ISR	Israel	5.4	11	2.0	12	3.8	6	-0.4	11	-9.0	-3.6	-11.6	-4.9
SGP	Singapore	5.1	12	0.4	15	4.6	5	0.1	8	-5.1	0.0	-13.1	-5.9
ZAF	South Africa	4.1	13	8.1	3	-0.8	13	-3.1	15	-21.5	-17.4	-23.1	-8.1
TUR	Turkey	4.0	14	3.6	11	0.4	12	0.0	10	-21.2	-17.2	-16.0	-3.5
BRA	Brazil	0.7	15	-0.8	16	-0.9	14	2.4	1	-14.3	-13.6	-10.3	-2.3
POL	Poland	-6.1	16	0.7	14	-4.4	16	-2.3	14	-2.4	-8.5	1.1	-1.2

Source: Authors' elaborations on WTA data.

Finally, it can be noticed that the value of the index *Delta_LAFAY* (*MHT*) is always of the opposite sign to that of the changes (over the same period) in both the 'trade polarization' index (P_C) and the 'trade dissimilarity' index (D_C), a result which complements the cross-country regularities displayed in Figures 1 and 2.[12]

As a matter for further investigation, we use our sample countries to examine whether an initial technological disadvantage is a boost (or detrimental) to a country's subsequent trade upgrading. A discernible pattern emerges when the HT1 sector results are isolated from the bulk of other medium- and high-tech products. In particular, as shown in Figure 3, the negative correlation between the degree of trade technological intensity in the initial period *excluding* the electronics and electrical sector (index $LAFAY_C(MHT\_H1)_{(1985\text{-}1987)}$ on the horizontal axis) and its subsequent change (as measured by index $Delta\_LAFAY_C(MHT\_H1)$ on the vertical axis) suggests evidence of a catching-up phenomenon among the lagging countries. In the HT1 sector, instead, no clear pattern emerges (see Figure 4), although some weak evidence seems to indicate that specialization in electronics may be a cumulative process, in which lagging countries may be left further behind.

Overall, the above evidence seems to support the notion that technological upgrading has been quite widespread among our sample countries, although with a large variance.

12 Refer to the last two columns on the right in Table 3, where figures are computed as:

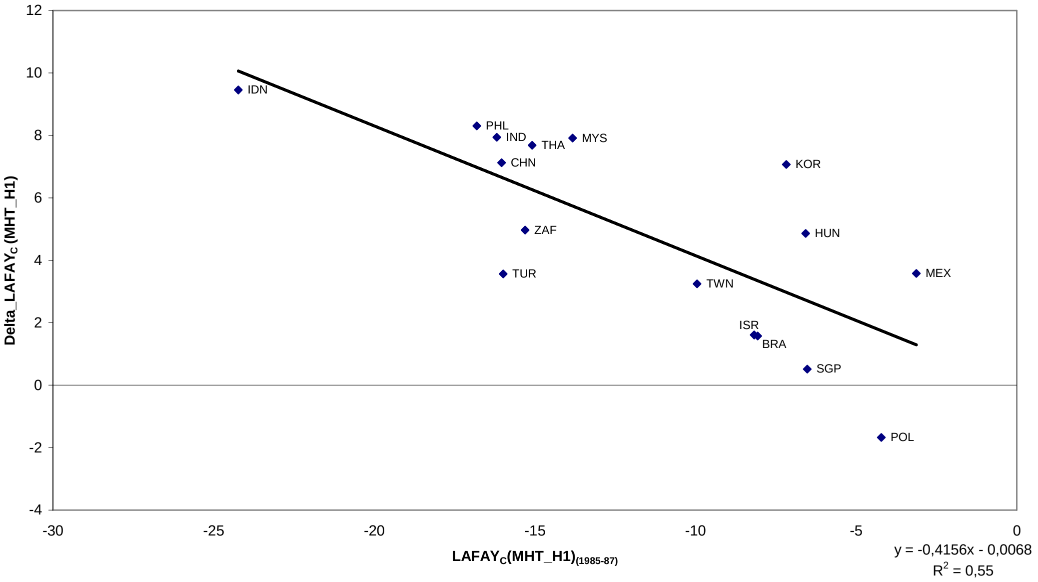
$$Delta\_D_C = D_{C\,(1999\text{-}2001)} - D_{C\,(1985\text{-}1987)}$$

$$Delta\_P_C = P_{C\,(1999\text{-}2001)} - P_{C\,(1985\text{-}1987)}$$

This observation also emerges in the comparison of the frequency distributions of the $LAFAY_C(MHT)$ indexes in the initial and final periods (see Figure 5).

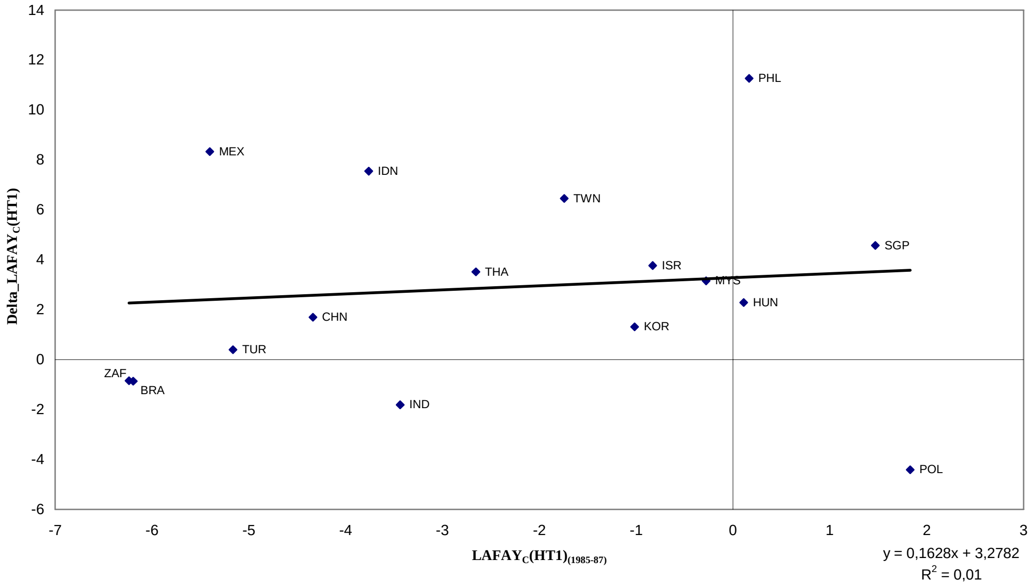
As a matter of fact, the frequency distribution has not only shifted over time to the right, towards more positive values of the index, but also its shape has changed and has become more negatively asymmetric (a longer tail to the left). Since our sample, however, is not fully representative of the diverse nor the poorest parts of the developing world, these findings do not allow to draw any inference on out-of-sample countries or on their chances of not being left technologically behind.

Figure 3. Trade technological upgrading by emerging countries *excluding* electronics and other high-tech electrical goods (MHT_H1 product group)



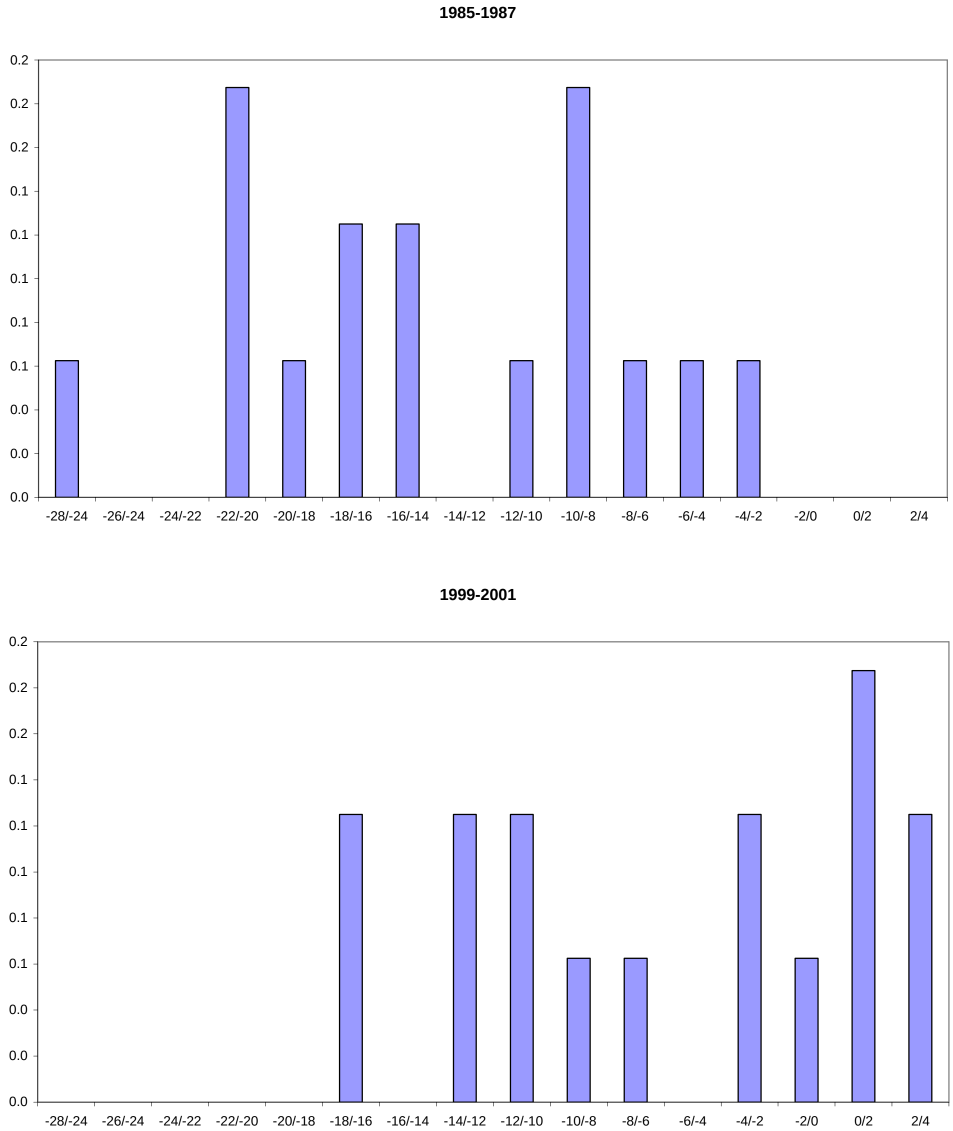
Source: Authors' elaborations on WTA data.

Figure 4. Trade technological upgrading by emerging countries in electronics and other high-tech electrical goods (HT1 product group)



Source: Authors' elaborations on WTA data.

Figure 5. Frequency distributions of LAFAY$_C$ (MHT) indexes in the initial and final periods



Source: Authors' elaborations on WTA data.

Our evidence of an overall superior technological performance of the East Asian trading economies broadly tends to confirm earlier results by Lall (2000) and UNCTAD (2003). In these studies, the evolution of normalized export shares across broad sectors over the last two decades is taken as indicators of dynamism in RCAs. On the other hand, whereas those studies suggest that the best performance was achieved in particular by the advanced countries in the region, our results tells a story of more widespread success (see, for example, the superior performance of the Philippines, Indonesia, and, to a less extent, China).

In either event, our analysis tends to confirm previous evidence that, with the exception of Mexico, countries in other emerging regions have been disadvantaged by less dynamic trade structures and in a few cases by further despecialization in technology-intensive production over the last two decades.

3 The domestic determinants

3.1 Model and methodology

The empirical specification. In the previous section we analysed the changing pattern of RCAs in international trade for our sample countries and found that their technological performance has been quite diversified. In this section we try to explain this variance by looking at a set of industry and country specific competitiveness factors. In addition to cost competitiveness, we consider a list of determinants which, according to a variety of theoretical models, should enhance a country's ability to compete in technology intensive sectors: the accumulation of physical capital, the availability of skilled human resources, and the acquisition of foreign technology via imports of capital goods. We also control for the influence of agglomeration factors and increasing returns to scale by looking at the size of the domestic product markets and proximity to a large regional market pivoted upon a major advanced economy.

We set up an empirical model in which the revealed comparative advantage in international trade for country *c* in sector *i* at time *t* (RCA_{cit}) is determined as follows:

$$RCA_{cit} = \beta_{1,S} ulc_{cit} + \beta_{2,S} inv_{cit} + \beta_{3,S} HK_{ct} + \beta_{4,S} M7_{ct} + \beta_{5,S} GDP_{ct}$$
$$+ \beta_{6,S} US\_close + \beta_{7,S} JP\_close + \beta_{8,S} EU\_close + \varepsilon_{cit}$$

The subscripts of the variables refer to country *c*, industry *i* and time *t.* Regression variable *ulc* is the industry-specific unit labour costs; *inv* is the industry-specific investment rate; *HK* is the economy-wide human capital stock, *M*7 is the economy-wide import penetration in capital goods, *GDP* is the market size and *US_close*, *JP_close* and *EU_close* are a set of dummy variables capturing country proximity to the US, Japanese and EU markets, respectively. Parameters subscript S = [*LT, MHT*] is to discriminate between observations belonging to either a low-tech (*LT*) or a medium- and high-tech (*MHT*) industry; therefore, beta coefficients $\beta_{1,S}$, ……, $\beta_{8,S}$ are allowed to vary between the LT and the MHT sectors, which is the same as to allow for two separate models, one for the observations belonging to the low-tech industry subsample (S=LT) and the other for the complementary subset (S=MHT).

We expect that:

$\beta_{1,LT} \leq \beta_{1,MHT} \leq 0$

$\beta_{2,MHT} \geq \beta_{2,LT} \geq 0$

$\beta_{3,LT} \leq 0$ and $\beta_{3,MHT} \geq 0$

$\beta_{4,LT} \leq 0$ and $\beta_{4,MHT} \geq 0$

$\beta_{5,LT} \leq 0$ and $\beta_{5,MHT} \geq 0$.

Unit labour costs (*ulc*) capture production comparative advantages à la Ricardo and should be negatively correlated with the dependent variable; moreover, as price competition should be more intense in low-tech than in technology-intensive industries, we expect the elasticity of production costs to be larger in the former sectors (therefore we predict: $\beta_{1,LT} \leq \beta_{1,MHT} \leq 0$). The rate of investment (*inv*) should capture the technological advantage provided by the domestic accumulation in physical capital which we expect to be a crucial requirement, particularly for internationally viable high-tech production (therefore we predict: $\beta_{2,MHT} \geq \beta_{2,LT} \geq 0$). With regard to the country-specific factors, we assume that as countries increase their human capital stock (*HK*) their specialization pattern shifts away from low-tech towards medium- and high-tech production, reflecting the accumulation of basic technical knowledge needed to apply and master modern technology (therefore: $\beta_{3,LT} \leq 0$ and $\beta_{3,MHT} \geq 0$).[13] We also expect that countries where foreign equipment is increasingly available through imports (*M*7) are more familiar with modern technology from abroad, and are therefore better equipped to compete in technology-intensive industries (therefore: $\beta_{4,LT} \leq 0$ and $\beta_{4,MHT} \geq 0$). Moreover, as increasing returns to scale are more common in medium- or high tech-intensive industries, domestic market size should exert a positive influence on a country's ability to export in these sectors (therefore: $\beta_{5,LT} \leq 0$ and $\beta_{5,MHT} \geq 0$). Finally, with respect to the 'advanced market proximity' dummies, their impact is likely to depend on the intensity of knowledge spillover effects across international borders and different industries. In particular, proximity to the world leading markets in technological innovation, the US and Japan, is expected to improve country performance in technology-intensive sectors only as long as international and between-industry knowledge externalities are strong enough to prevail. Another complicating factor is that the regional trade agreements which became effective at the beginning of the 1990s (NAFTA, EU Association Agreements) have affected the international specialization of countries via changes in tariff and non-tariff barriers. All considered, the influence of the 'advanced market proximity' dummies is therefore left to the data to be determined.

The dataset and the regression variables. In building our cross-country panel dataset, we encountered four problems, which were resolved as follows:

- Matching different statistical sources. While data for the dependent variable are derived from international trade statistics based on 3-digit SITC (Rev. 2) classification, industry-level data (on the right-hand side) are derived from UNIDO industrial statistics codified under the 3-digit ISIC (Rev. 2) classification. In order to integrate these two sources, we compile the concordances reported in Appendix 2 and regroup the 182 traded products of the 3-digit SITC (Rev. 2) classification into 28 manufacturing industry categories, each labelled by a 3-digit code of the ISIC classification. Based on the resultant, more aggregate export and import trade flows, we compute measures of international revealed comparative advantage for each industry *i* based on the Lafay indexes (LA_i^c; see section 2) (see description for dependent variable *indlaf*(*c,i,t*) in Table 4).[14]

- Estimating labour productivity for each sector, in order to compute industry-level unit labour costs. While nominal labour productivity in local currency was easily available, it was more difficult to measure real labour productivity in internationally comparable currency. Starting from statistics on nominal value

13 Per capita GDP could also be used in place of the *HK* variable, as they are both proxies for the intangible resources that contribute to an economic environment favourable to technology diffusion.

14 As shown in footnote 6, this is equivalent to compute LA_i^c for each of the 182 traded products, and then sum up the elementary LAic within each industry. In both cases one obtains the same values for the dependent variable *indlaf*(*c,i,t*).

added and production price indexes (in national currency) contained in the UNIDO database, we deflate the former by the latter, to obtain real value-added. Then we convert real value-added into international dollars to make them internationally comparable (at the purchasing power parity exchange rates of the base year; see variable *lp*(*c,i,t*-1) in Table 4).[15] Unit labour costs (see variable *ulc*(*c,i,t*-1) in Table 4) are then computed as the ratios of total wages (in dollars at the current market exchange rate) on real value-added (at constant international dollars).

– Building a technology dummy, in order to attach the appropriate subscript *S* = [*LT, MHT*] to each industry *i*. The technology dummy *MHT* (see Table 4) is obtained from our elaborations on a public database on R&D intensity in US manufacturing firms (based on the number of scientists and the amount of R&D expenditures; see Table 5). The information provided should be robust, as previous research findings show that the pattern of R&D intensity tends to be quite stable across countries and over time (see Montobbio 2003). Six industries (chemicals, electrical and non-electrical machinery, professional and scientific equipment and transport equipment, denoted by ISIC codes 351-52, 382-85) are identified as the most R&D intensive and are therefore labelled with subscript *S* = *MHT*.[16]

– Building the 'advanced market proximity' dummies. Whereas it was relatively straightforward to select the potential sample countries based on their geographical proximity to each of the three major advanced markets, we also have to take into account temporal shifts in the trade regime resulting from regional free trade agreements. In order to pick up the year when NAFTA in North America and the Association Agreements in Europe have started to have economic effects, we analyse the growth in bilateral trade flows between Mexico and the United States, and between Hungary, Poland and the EU old member countries (see the description of *US_close* and *EU_close* dummy variables in Table 4). With regard to the *JP_close* dummy variable, India is excluded because of the low intensity of India-Japan bilateral trade during the entire sample period.

Description of other regression variables are given in Table 4.

The regression methodology. Our cross-country panel covers 16 countries, 28 manufacturing industries, spanning 16 years (1985-2000). We estimate with industry fixed effects and robust standard errors. Independent variables are lagged one period in order to reduce reverse causality problems.

Due to incomplete matrices for some countries (across time or industry dimensions), and also due the loss of observations resulting from lagged independent variables, our (maximum) number of observations is 3,677, of which 870 are for the subsample of the

---

15 We should have used industry-specific purchasing power parity (PPP) exchange rates, but unfortunately only GDP-wide measures of PPPs were available.

16 By looking at the concordance tables in Appendix 2, one may also infer that the set of 3-digit SITC (Rev 2) codes combined in product group MHT of section 2, overlaps to a very large extent with the set of associated to ISIC codes 351-52 and 382-85. This ensures the coherence between the analyses carried out in sections 2 and 3.

medium- and high-technology intensive industries (subscript *S*=*MHT*) and a significantly larger number of observations are for the low-tech subsample. Since variable $HK_{c,t-1}$ is not available for all countries (in particular, Hungary and Poland), its inclusion reduces total observations to about 3,000.

In order to isolate the statistical effects between the two subsamples (low-tech and medium- and high-tech), we have the option of running separate regressions for each subsample, or operating on the full sample and introducing interaction terms between each regressor and the technology dummy (variable *MHT*). In the latter methodology, although the regressions are run on the full sample, this procedure yields the same coefficient values as running two sets of regressions, one for each subsample. We prefer the latter procedure as it allows us to test for the statistical differences of the regression coefficients between the two subsamples.

Table 4
Regression variables

Name	Description
indlaf(*c,i,t*)	Lafay index computed over export and import flows in industry *i*, country *c* at time *t* (see section 2 for the formulation and properties of the Lafay index LA_i^c).
[*w*(*c*,*i*,*t*-1)]	Wage rate in industry *i*, country *c*, at time *t*-1 (current prices, US$).
[*lp*(*c*,*i*,*t*-1)]	Labour productivity in industry *i*, country *c* at time *t*-1 (constant prices, 1991=100, PPP).
ulc(*c,i,t*-1)	Unit labour cost in industry *i*, country *c* at time *t*-1: *ulc*(*c*,*i*,*t*-1) = *w*(*c*,*i*,*t*-1) / *lp*(*c*,*i*,*t*-1).
ulc_n(*c,i,t*-1)	'Normalized' unit labour cost in industry *i*, country *c* at time *t*-1, that is the ratio of the unit labour cost in industry *i* [*ulc*(*c*,*i*,*t*-1)] to the average unit labour cost across all industries (*i*=1,..,28) in country *c* at time *t*-1.
inv(*c*,*i*,*t*-1)	Ratio of gross fixed capital formation to value added (both at current prices, national currency) in industry *i*, country *c* at time *t*-1.
Inv_n(*c,i,t*-1)	'Normalized' investment rate in industry *i*, country *c* at time *t*-1, that is the ratio of the investment rate in industry *i* [*inv*(*c*,*i*,*t*-1)] to the average investment rate across all industries (*i*=1,..,28) in country *c* at time *t*-1.
HK(*c*,*t*-1)	Country's average years of schooling in country *c* at time *t*-1.
*M*7(*c*,*t*-1)	Ratio of machinery imports to GDP (both in current US$) in country *c* at time *t*-1.
GDP(*c*,*t*-1)	GDP (billions of constant PPP dollars) in country *c* at time *t*-1.
MHT	Dummy variable, MHT=1 if industry *i* belongs to medium- and high-tech industry group.
US_close	Dummy variable, =1 for Mexico from 1990 to 2001, =0 otherwise.
JP_close	Dummy variable, =1 for China, Indonesia, Malaysia, Philippines, Singapore, South Korea, Taiwan and Thailand, =0 otherwise.
EU_close	Dummy variable, =1 for Hungary and Poland from 1989 to 2001, =0 otherwise.

Table 5
Index of R&D intensity in US manufacturing industries

ISIC - Rev.2 Industry Classification	US_SIC_1987 Classification		Normalized index of: R&D funds, % of domestic net sales, 1997-98	Normalized index of: Scientists/ engineers, % of employees, 1997-98 [a]	Normalized index	Ranking by decreasing normalized index
			(a)	(b)	[(2) + (b)]/2	
300	-	Total manufacturing				
311	20	Food products [b]	-0.754	-0.834	-0.794	21
313	20	Beverages [b]	-0.616	-0.281	-0.449	12
314	21	Tobacco [b]	-0.616	-0.281	-0.449	12
321	22	Textiles	-0.569	-0.776	-0.672	18
322	23	Wearing apparel, exc. footwear	-0.38	-0.776	-0.578	16
323	31	Leather products	-0.574	-0.776	-0.675	19
324	31	Footwear, exc. rubber or plastic	-0.574	-0.776	-0.675	19
331	24	Wood products, exc. furniture	-0.455	-0.644	-0.55	15
332	25	Furniture, exc. metal	-0.487	-0.644	-0.566	16
341	26	Paper and products	-0.482	-0.477	-0.48	13
342	27	Printing and publishing [c]	-0.613	-0.477	-0.545	14
351	281-82, 286	Industrial chemicals	0.795	1.413	1.104	6
352	283-84-285, 287-89	Other chemicals	1.802	2.144	1.973	3
353	13, 29	Petroleum refineries	-0.627	-0.055	-0.341	10
354	13, 29	Misc. petroleum and coal products	-0.627	-0.055	-0.341	10
355	30	Rubber products	-0.212	-0.396	-0.304	8
356	30	Plastic products	-0.212	-0.396	-0.304	8
361	32	Pottery, china, earthenware	-0.205	-0.41	-0.307	9
362	32	Glass and products	-0.205	-0.41	-0.307	9
369	32	Other non-metallic mineral products	-0.205	-0.41	-0.307	9
371	331-32, 398-99	Iron and steel	-0.689	-0.769	-0.729	20
372	333-36	Non-ferrous metals	-0.639	-0.523	-0.581	17
381	34	Fabricated metal products	-0.292	-0.549	-0.42	11
382	35	Machinery, exc. electrical	1.237	1.428	1.333	4
383	36	Machinery, electric	1.668	2.283	1.975	2
384	37	Transport equipment	1.059	1.495	1.277	5
85	38	Professional and scientific equipment	3.495	2.089	2.792	1
390	39	Other manufactured products [c]	-0.024	-0.136	-0.08	7

Notes: [a] R&D scientists and engineers measured in full-time equivalent units;
[b] 1999 figures;
[c] 1999 figures for column (b).

Source: IRIS database, National Science Foundation.

Table 6
Regression results

Dependent variable = *indlaf*(*c*,*I*,*t*)
c (country) = 16; *i* (industry) = 28; *t* (time) = 15

	LSDV regression with robust standard errors								
Regresors	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ulc(*c*,*i*, *t*-1)	-0.222***	-0.262***							
ulc(*c*,*i*, *t*-1)**MHT*	-0.195	0.002							
inv(*c*,*i*,*t*-1)	0.018	0.005							
inv(*c*,*i*,*t*-1)**MHT*	1.920***	2.216***							
ulc_n(*c*,*i*, *t*-1)			-0.160***	-0.158***	-0.141***	-0.165***	-0.149***	-0.153***	-0.154***
ulc_n(*c*,*i*, *t*-1)**MHT*			-0.479***	-0.342***	-0.367***	-0.418***	-0.199	-0.166	-0.300**
inv_n(*c*,*i*,*t*-1)			0.096***	0.033	0.087**	0.094***	0.036	0.037	0.090***
inv_n(*c*,*i*,*t*-1)**MHT*			0.462***	0.386***	0.478***	0.466***	0.474***	0.573***	0.565***
HK(*c*,*t*-1)		-0.213		-0.156***			-0.156***	-0.163***	
HK(*c*,*t*-1)**MHT*		1.283		0.666***			0.691***	0.737***	
M7(*c*,*t*-1)		0.118			-1.353***		-1.392***	-1.556***	-1.302***
M7(*c*,*t*-1)**MHT*		0.081			4.530***		5.004***	5.955***	4.781***
GDP(*c*,*t*-1)		0.000				0.000***	-0.000**	0.000	0.000
GDP(*c*,*t*-1)**MHT*		0.000				-0.001***	0.001***	0.000**	-0.001***
US_close dummy		-0.015						-0.465***	-0.711***
*US_close dummy*MHT*		0.290						1.984***	3.075***
JP_close dummy		0.321						0.238**	0.035
*JP_close dummy*MHT*		0.361						-1.385***	-0.484*
EU_close dummy									-0.171
*EU_close dummy*MHT*									0.748**
Constant	-0.875***	-0.903	-0.052	-0.073	-0.009	-0.064	-0.084	-0.055	0.024
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	No	No	No	No	No	No	No
Country dummies	Yes	Yes	No	No	No	No	No	No	No
Adj. R-squared	0.46	0.48	0.37	0.43	0.4	0.4	0.46	0.48	0.43
Observations	3536	2863	3536	3120	3313	3450	2863	2863	3227

Note: ***, ** and * indicate that coefficient is statistically different from zero at 1%, 5% and 10% significance level, respectively.

In devising our regression methodology, we also take into account the fact that the dependent variable *indlaf*(*c,i,t*)—similarly to other more standard indexes of trade specialization—is subject to a strict constraint, as it is bounded by construction to sum up to zero across industries.[17] This constraint is a potential source of difficulties when dealing with both the economy-wide and the industry-specific determinants. In fact, when the regression is run on the full sample of observations, inclusion of the economy-wide determinants (such as HK_{ct}, $M7_{ct}$ and GDP_{ct}) makes no sense statistically, as the mean value of the dependent variable is bound to be fixed across industries at each time *t* and for each country *c*. Nevertheless, in such a setting, it is possible to capture the effect of economy-wide regressors on the pattern of the dependent variable by separating the observation sample along whatsoever industry line, as we do by means of the technology dummy *MHT*.

Second, in order to treat the industry-specific regressors in the most appropriate way in view of the constraint problem with the dependent variable, we apply two alternative methodologies. First, we include country and time fixed-effect dummies among the regression variables, a method equivalent to shifting the industry-specific regressors (*ulc*(*c,i,t*-1) and *inv*(*c,i,t*-1)) to the origin. As a second alternative, industry-specific regressors are normalized by taking the ratio to the average value across industries (for each *c* and *t*), so that the resulting variables (*ulc_n*(*c,i,t*-1) and *inv_n*(*c,i,t*-1)) are bound to sum up to a constant number across industries (see also descriptions in Table 4).

In Table 6, columns (1) and (2) report the results of applying the first method to industry-specific regressors, whereas columns (3) to (9) are obtained with the alternative procedure. Both yield quite consistent results with regard to the influence of the industry-specific variables. However, the first procedure does not work well with respect to the country-specific determinants in the regression, as their effect tends already to be captured by the country dummies.[18]

3.2 Regression results

Table 6 reports the results for a set of nine regressions. The number of observations for each regression is less than for the total sample, as the inclusion of some independent variables drops some observations due to data limitations (for example, when the country-specific variable *HK*(*c,t*-1) is included, observations for Poland and Hungary are excluded due to data unavailability).

Columns (1) and (3) include only industry-specific determinants while country-specific determinants are (gradually) introduced columns (4) to (9).

All the independent variables enter the regressions with interaction terms, computed as the product between each variable and the technology dummy (*MHT*). This procedure allows us to compare the coefficients between the two subsamples (*S* = [*LT, MHT*]), and to determine their statistical difference. As a result, the beta coefficients as such

---

[17] Since we compute RCAs by means of Lafay indexes, the constraint is that the dependent variable for each country *c* and time *t* sums up to zero across industries (see the Lafay index properties explained in section 2). If a Balasa index is used instead, it would have summed up to 1.

[18] Therefore, regression results shown under column (2) in Table 6 are not elaborated further.

capture the statistical influence on the low-tech subsample only; the sum of the beta coefficients of the regressors and the interaction terms measure the effects on the medium and high-tech subsample only.

Results in Table 6 tend to support our empirical model. The regressors' coefficients have the predicted signs and are statistically significant. In column (1), where the model includes industry-specific variables only (but for country and time fixed effect dummies), the unit labour cost variable (*ulc*(*c,i,t*-1)) always has a robust negative effect. The physical capital accumulation variable (*invc,i,t*-1)) has a positive and robust coefficient only when the sample is restricted to the medium- and high-technology intensive sectors (the coefficient of the interaction term is indeed statistically significant at 1 per cent significance level).

In columns (4) to (7) we introduce the country-specific determinants, first one at a time, then all simultaneously. When introduced in isolation, explanatory variables *HK*(*c, t*-1) and *M*7(*c, t*-1) both exhibit a positive influence when associated with MHT observations (as shown by the positive sign of their interaction terms' coefficients) and a negative one otherwise. This supports our prediction that imports of capital goods and accumulation of human capital both boost RCAs in medium- and high-technology-intensive sectors. On the other hand, results for the variable *GDP*(*c, t*-1) apparently show a negative influence for market size; this, however, is probably due to a statistical problem caused by omitted variables, as regressors *GDP*(*c, t*-1) and *M*7(*c, t*-1) are negatively correlated, as is to be expected if large markets are relatively closed to foreign trade. As a matter of fact, in regression (7) when the influence of the country-specific determinants is considered simultaneously, the associated beta coefficients and those of the interaction terms exhibit the predicted signs. Moreover, it can be noticed that the pattern of influence of the industry-specific determinants is fully consistent with the results already obtained in regression (1) with a different procedure: in regression (7) we find a robust negative coefficient for the 'normalized' unit labour cost variable (*ulc_n*(*c,i,t*-1)), a positive and statistically significant coefficient for the 'normalized' physical capital accumulation variable (*inv_n*(*c,i,t*-1)) only when the sample is restricted to MHT observations.

With respect to the 'advanced market proximity' dummy variables, results reported in columns (8) and (9) are somewhat more difficult to interpret. Closeness to the US market is found to boost technology-intensive production in Mexico to a greater degree than predicted on the basis of its industry and country-specific characteristics. A similar pattern is also found in the case of Poland and Hungary, although the coefficients associated with dummy variable *EU_close* carry less statistical significance. Finally, proximity to the Far East markets *per se* does not seem to boost RCAs in medium- and high-tech production, once the influence of other explanatory variables has been accounted for.

We may conclude that positive and large RCAs in international trade tend to be associated with low unit labour costs in the corresponding domestic activities and that this relationship holds for both low-technology and for medium- and high-tech production. On the other hand, high domestic accumulation of physical capital tends to be associated with stronger RCAs only in medium- and high-technology production. The above results are reinforced when we control for economy-wide factors enhancing the exposure to and the absorption of foreign technology by domestic producers. In particular, the international advantage (a positive RCA) in technology-intensive production tends to strengthen for countries with a relatively high human capital endowment *HK*, for those receiving more technology incorporated in foreign goods (as measured by the penetration of capital good imports, *M7*), and for those able to exploit returns to scale and agglomeration factors associated with market size (as measured by *GDP*). Finally, although we have shown in section 2 that sample countries located in East Asia tend to exhibit larger RCAs in medium- and high-tech sectors than countries in other regions, after controlling for the influence of other explanatory variables we find no evidence of a pure 'geographic factor' driving this specialization pattern.

4 Conclusions

Based on a sample of sixteen emerging countries over the period 1985-2000, we have investigated the empirical linkages between the pattern of international trade specialization (measured by a modified version of the Lafay index) and, as a major driving factor, the competitiveness structure of the domestic manufacturing sector.

We find that the trade structures of the sample countries have become less polarized over time, as their international specialization in labour-intensive manufactures has diminished and, conversely, they have improved on their initial disadvantage in capital and technology-intensive goods. At the same time, their trade structures have become more similar to those of the advanced economies (G7 countries), which have highly diversified trade and whose comparative advantages are skewed towards technology-intensive production.

Despite the rather widespread improvements, our synthetic indicator of technological trade intensity shows the persistence of quite a high variance across the sample countries. In particular, East Asian countries tend to outperform with respect to their international production patterns, especially on a dynamic basis. The favourable performance partly reflects their high and increasing international specialization in electric and electronic products. This may need a caveat, however, since we may have overestimated the technological content of developing-country trade by classifying some commodity groups as technology-intensive whereas they may not be. We should keep in mind that production in a number of manufacturing sectors has become highly fragmented vertically, and cheap-labour developing countries are often involved in production stages that are quite poor in technology. We have tried to minimize this problem by using, as an indicator of international trade RCAs, a modified version of the Lafay index, which is based on net trade flows and therefore traces more precisely the actual value added contributed to exports by the domestic sector.

In our empirical model the pattern of RCAs in international trade is linked to the competitiveness structure of the domestic sector, captured through a set of industry- and country-specific variables. In addition to cost competitiveness, we consider other determinants which, according to theoretical models, should enhance a country's ability to compete in technology-intensive sectors. These include accumulation of physical capital, availability of skilful human resources, and acquisition of foreign technology via imports of capital goods. We also control for the influence of agglomeration factors and increasing returns to scale by looking at the overall size of the domestic market and proximity to a large regional market pivoted on a major advanced economy.

The econometric exercise linking the RCA patterns in international trade to the competitiveness structure of the domestic sector has confirmed the validity of our assumption: the determinants of RCAs do indeed differ across manufacture industries, depending on their degree of technology-intensity. We have tested this assumption by means of a cross-country panel that included 28 broad manufacturing activities over 16 years (from 1985 to 2000) for 16 emerging countries (same sample as before), running separate regressions on the two subsamples, obtained by splitting the observations between those belonging to high- and medium-technology intensive sectors and those belonging to low-tech ones.

We find that positive and large RCAs in international trade tend to be associated with low unit labour costs in the corresponding domestic activities both in low-technology production and in medium- and high tech ones. On the other hand, high domestic accumulation of physical capital is shown to be associated with stronger RCAs only in medium- and high technology production. The above results also hold when we control for economy-wide factors that enhance the exposure to and the absorption of foreign technology by domestic producers. In particular, the international advantage in technology-intensive production tends to strengthen for countries that have a relatively high human capital endowment, receiving more technology incorporated in foreign goods (as measured by the penetration of capital good imports), and those with access to larger product markets. Finally, after controlling for the influence of industry and country-specific explanatory variables, we find no support for the role of a pure 'geographic location' factor driving the specialization pattern of East Asian countries towards medium- and high technology-intensive sectors.

References

Arndt, S. W., and H. Kierzkowski (eds) (2001). *Fragmentation.* Oxford: Oxford University Press.

Balassa, B. (1966). 'Trade Liberalization and "Revealed" Comparative Advantage'. The Manchester School of Economic and Social Studies No. 33. Manchester.

Basili, A., P. Epifani, and R. Helg (2000). 'On the Dynamics of Trade Patterns'. CESPRI Working Paper 115. Milano: Centre for Research on Innovation and Internationalisation, Universita Bocconi.

Bugamelli, M. (2001). 'Il Modello di Specializzazione Internazionale dell'Area Dell'euro e dei Principali Paesi Europei: Omogeneità e Convergenza. Temi di Discussione 402. Rome: Banca d'Italia.

Bosworth, B. P., and S. M. Collins (2003). 'The Empirics of Growth: An Update'. *Brookings Papers on Economic Activity*, 2: 113-79.

Grossman, G. M., and E. Helpman (1991). *Innovation and Growth in the Global Economy*. Cambridge: MIT Press.

Heston, A., R. Summers, and B. Aten (2002). *Penn World Table Version 6.1*. CICUP.

International Monetary Fund (IMF) (n.d.). World Economic Outlook Database.

IRIS (n.d.). IRIS Database. Available at: http://www.epa.gov/iriswebp/iris/

Jones, R. W., and H. Kierzkowski (2004). 'International Trade and Agglomeration: an Alternative Framework'. HEI Working Paper 10/2004. Geneva: Graduate Institute of International Studies.

Krugman, P. R. (1980). 'Scale Economies Product Differentiation and the Pattern of Trade'. *American Economic Review*, 70: 950-9.

Krugman, P. R. (1986). 'A "Technology Gap" Model of International Trade'. In K. Jungen-felt and D. Hague (eds), *Structural Adjustment in Developed Open Economies*. London: Macmillan Press Ltd.

Krugman, P. R. (1987). 'The Narrow Moving Band, the Dutch Disease, and the Competitive Consequences of Mrs. Thatcher'. *Journal of Development Economics*, 27: 41-55.

Krugman, P. R. (1991). 'Increasing Returns and Economic Geography'. *Journal of Political Economy*, 99 (3): 483-99.

Lafay, J. (1992). 'The Measurement of Revealed Comparative Advantage'. In M. G. Dagenais and P. A. Muet (eds), *International Trade Modelling*. London: Chapman & Hall.

Lall, S. (2000). 'The Technological Structure and Performance of Developing Country Manufactured Exports, 1985-1998'. QEH Working Paper Series 44. Oxford: Queen Elizabeth House, University of Oxford.

Landesmann, M. A., and R. Stehrer (2001). 'Convergence Patterns and Switchovers in Comparative Advantage'. *Structural Change and Economic Dynamics*, 12 (4): 399-423.

Leamer, E. E. (1997). 'Evidence of Ricardian and Heckscher-Ohlin effects in OECD specialization Patterns'. In K. E. Maskus, P. M. Hooper, E. E. Leamer and J. D. Richardson (eds), *Quiet Pioneering: Robert M. Stern and his International Economic Legacy*. Chicago: The University of Michigan Press.

Mayer, J., K. A. Butkevicius, and J. Pizarro (2003). 'Dynamic Products in World Exports'. *Review of World Economics*, 139 (4): 762-95.

Montobbio, F. (2003). 'Sectoral Patterns of Technological Activity and Export Market Share Dynamics'. *Cambridge Journal of Economics*, 27 (4): 523-45.

Rolli, V., and A. Zaghini (2003). 'International Market Access for the Exports of Developing Countries: Empirical Evidence and Trade Policy Issues'. In Banca d'Italia Il Commercio con l'Estero e la Collocazione Internazionale Dell'economia Italiana – Atti dell'Incontro di Studio in memoria di Stefano Vona Tenuto a Roma il 14 Dicembre 2001.

Stehrer, R., and J. Wörz (2003). 'Technological Convergence and Trade Patterns'. *Review of World Economics*, 139 (2): 191-219.

World Trade Analyzer (WTA) (n.d.). World Trade Database.

UNCTAD (2003). *Trade and Development Report, 2003*, chapter 5. New York and Geneva: United Nations.

UNIDO (n.d.). Indstat Database.

Venables, A. J. (2006). ‘Shifts in Economic Geography and their Causes’. Paper presented at the 2006 Jackson Hole Symposium, 24-26 August.

Young, A. (1991). ‘Learning by Doing and the Dynamic Effects of International Trade’. *Quarterly Journal of Economics*, 106 (2): 369-405.

Appendix 1

Residual (not classified) trade in manufactures
As percentage of total trade in manufactures

	China		South Korea		Mexico		Taiwan		Singapore		Malaysia		Thailand		Indonesia	
	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP
1985	13.5	5.8	0.2	0.2	0.2	0.5	0.1	0.2	0.4	0.3	0.1	0.4	0.1	0.2	0.0	0.2
1986	14.6	7.8	0.2	0.2	0.3	0.7	0.1	0.2	0.5	0.4	0.1	0.7	0.1	0.2	0.0	0.3
1987	13.3	6.1	0.2	0.2	0.2	0.6	0.1	0.2	0.6	0.4	0.1	0.4	0.2	0.2	0.0	0.2
1988	0.4	0.4	0.2	0.2	0.5	0.5	0.3	0.3	0.5	0.4	0.1	0.4	0.1	0.2	0.1	0.3
1989	0.4	0.4	0.2	0.2	0.5	0.5	0.2	0.3	0.5	0.4	0.1	0.4	0.1	0.2	0.0	0.3
1990	0.2	0.4	0.3	0.2	0.6	0.6	0.3	0.5	0.6	0.4	0.1	0.4	0.1	0.1	0.0	0.2
1991	0.2	0.4	0.3	0.2	0.6	0.6	0.2	0.5	0.6	0.4	0.1	0.3	0.1	0.2	0.0	0.2
1992	0.2	0.5	0.2	0.2	0.5	0.9	0.3	0.6	0.7	0.3	0.1	0.3	0.1	0.2	0.0	0.2
1993	0.2	0.4	0.2	0.2	0.5	1.0	0.3	0.6	0.5	0.4	0.1	0.3	0.1	0.2	0.0	0.2
1994	0.3	0.3	0.2	0.2	0.4	1.1	0.3	0.7	0.5	0.3	0.1	0.3	0.2	0.2	0.0	0.1
1995	0.4	0.3	0.2	0.2	0.4	0.9	0.2	0.3	0.5	0.3	0.1	0.2	0.3	0.2	0.0	0.1
1996	0.3	0.3	0.2	0.2	0.3	0.8	0.2	0.5	0.5	0.3	0.1	0.2	0.1	0.2	0.0	0.1
1997	0.5	0.4	0.2	0.2	0.3	0.7	0.2	0.3	0.5	0.3	0.1	0.2	0.1	0.2	0.0	0.1
1998	0.5	0.3	0.2	0.2	0.3	0.7	0.2	0.2	0.5	0.3	0.1	0.2	0.1	0.2	0.0	0.1
1999	0.5	0.3	0.2	0.2	0.2	0.7	0.2	0.2	0.5	0.3	0.1	0.2	0.1	0.2	0.1	0.2
2000	0.4	0.3	0.2	0.1	0.2	0.6	0.1	0.2	0.4	0.3	0.1	0.2	0.1	0.2	0.0	0.1
2001	0.5	0.3	0.2	0.2	0.2	0.7	0.1	0.3	0.6	0.3	0.1	0.3	0.1	0.2	0.1	0.1

	Brazil		Philippines		India		Poland		Hungary		Turkey		Israel		South Africa	
	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP
1985	0.1	0.3	0.0	0.4	1.6	0.3	1.0	0.9	49.7	36.6	0.1	0.1	0.6	0.5	1.0	1.0
1986	0.1	0.5	0.0	0.3	1.7	0.4	0.9	1.0	48.6	37.7	0.1	0.1	0.6	0.5	0.1	1.5
1987	0.1	0.5	1.2	0.3	0.2	0.4	0.8	1.3	47.3	36.1	0.1	0.1	0.7	0.4	0.1	1.8
1988	0.1	0.5	0.0	0.3	0.2	0.6	0.7	1.4	44.4	38.0	0.1	0.3	0.7	0.4	0.1	2.0
1989	0.0	0.5	0.2	0.6	0.8	3.0	0.8	0.9	33.3	30.6	0.0	0.2	0.5	0.5	0.1	1.8
1990	0.1	0.4	0.1	0.2	0.1	0.4	0.8	0.6	26.8	28.7	0.1	0.2	0.6	0.5	0.1	1.7
1991	0.1	0.5	0.1	0.3	0.1	0.3	0.9	0.9	18.7	18.9	0.1	0.2	0.6	0.4	0.2	1.2
1992	0.1	0.4	0.1	0.4	0.2	0.4	1.0	1.3	20.1	18.4	0.1	0.2	0.5	0.5	0.1	0.9
1993	0.4	0.4	0.1	0.3	0.1	0.4	0.2	1.2	19.3	19.3	0.1	0.5	0.5	0.4	0.1	1.2
1994	0.1	0.3	0.1	0.3	0.1	0.4	0.7	1.0	12.9	12.2	0.1	0.4	0.4	0.4	0.3	1.1
1995	0.1	0.6	0.1	0.4	0.2	0.3	0.7	1.0	13.	11.	0.1	0.2	0.3	0.4	0.3	0.8

									5	5						
1996	0.1	0.7	0.1	0.3	0.2	0.3	1.1	0.9	1.2	1.2	0.2	0.2	0.3	0.4	0.5	0.8
1997	0.1	0.7	0.1	0.3	0.2	0.4	1.6	0.9	0.6	0.7	0.2	0.4	0.3	0.4	0.2	0.7
1998	0.1	0.6	0.1	0.3	0.2	0.6	0.8	0.8	0.6	0.7	0.2	0.4	0.3	0.4	0.3	0.7
1999	0.1	0.5	0.0	0.2	0.2	0.5	1.0	0.7	0.6	0.7	0.1	0.4	0.3	0.3	0.2	0.8
2000	0.1	0.6	0.0	0.3	0.2	0.5	0.6	0.6	0.4	0.7	0.2	0.5	0.2	0.3	0.6	1.0
2001	0.1	0.6	0.0	0.3	0.2	0.8	0.6	0.7	0.4	0.8	0.2	1.0	0.3	0.4	0.7	1.4

Source: Elaborations on WTA data.

Lall's technological classification of exports and concordances
between the standard international trade classification (SITC 3-digit, revision2) and the international standard industrial classification (ISIC 3-digit, revision 2) (*)

Resource-based manufactures				Low-technology manufactures				Medium-technology manufactures						High-technology			
RB1: agro-based		RB2: others		LT1: textiles, garments, footwear		LT2: others		MT1: automotive		MT2: process		MT3: engineering		HT1: electronic & electrical		HT2: other	
SITC	ISIC	SITC	ISIC	SITC	ISIC	SITC	ISIC	SITC	ISIC	SITC	ISIC	SITC		ISIC	SITC	ISIC	SITC
012	311	281	371	611	323	642	341	781	384			711	381	716	383	542	351
014	311	282	371	612	323	665	362	782	384	266	321	713	384	718	381/382	541	352
023	311	286	372	613	323	666	361	783	384	267	321	714	384	751	382	712	382
024	311	287	372	651	321	673	371	784	384	512	351	721	382	752	382	792	384
035	311	288	372	652	321	674	371			513	351	722	382	759	382	871	385
037	311	289	390	654	321	675	371			533	352	723	382	761	383	874	385
046	311	323	354	655	321	676	371			553	352	724	382	764	383	881	385
047	311	334	353	656	321	677	381			554	352	725	382	771	383		
048	311	335	353	657	321	679	371			562	351	726	382	774	383		
056	311	411	311	658	321	691	381			572	352	727	382	776	383		
058	311	511	351	659	321	692	381			582	351	728	382	778	383		
061	311	514	351	831	323	693	381			583	351	736	382				
062	311	515	351	842	322	694	381			584	351	737	382				
073	311	516	351	843	322	695	381			585	351	741	382				
098	312	522	351	844	322	696	381			591	351	742	382				
111	313	523	351	845	322	697	381			598	352	743	382				
112	313	531	351	846	321	699	381			653	321	744	382				
122	314	532	351	847	322	821	332			671	371	745	382				
233	351	551	352	848	322	893	356			672	371	749	382				
247	331	592	352	851	324	894	390			678	371	762	383				
248	331	661	369			895	390			786	384	763	383				
251	341	662	369			897	390			791	384	772	383				
264	321	663	369			898	390			882	352	773	383				
265	321	664	362			899	390					775	384				
269	321	667	369									793	384				
423	311	688	372									812	381				
424	311	689	372									872	385				
431	311											873	385				
621	355											884	385				
625	355											885	385				
628	355											951	382				
633	331																
634	331																
635	331																
641	341																

Note: (*) As the 3-digit SITC (rev. 2) disaggregation does not allow for a perfect concordance with the 3-digit ISIC (rev. 2) classification, the shown concordances bear inevitable approximations.

Appendix 3

$LAFAY[J]_c$ indexes, dissimilarity index (D_c), and polarization index (P_c) for 16 emerging economies and G7 countries

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
China	Product group J																	
	RB1	1.5	1.5	-0.1	-1.4	0.0	-1.2	-0.9	-0.2	0.6	-0.5	-0.9	-0.7	-1.3	-1.6	-1.3	-0.8	-0.6
	RB2	6.3	3.2	3.2	1.4	1.5	0.9	0.1	-0.4	-0.6	-0.4	-0.4	-0.8	-1.5	-1.1	-1.0	-1.4	-1.4
	LT1	13.4	16.8	17.8	16.1	16.7	13.4	12.7	15.3	15.7	14.6	11.7	10.9	10.8	9.8	9.5	8.9	8.7
	LT2	-1.2	-0.7	-0.5	0.5	0.3	2.1	3.0	4.4	2.0	3.8	4.6	4.1	4.7	5.1	5.0	4.7	4.5
	MT1	-3.2	-2.0	-1.3	1.1	-1.2	2.0	1.9	-2.5	-3.4	-2.3	-1.0	-0.7	-0.6	-0.3	-0.1	0.0	-0.2
	MT2	-3.7	-3.5	-4.3	-6.8	-5.0	-6.7	-7.7	-6.3	-4.4	-4.8	-5.2	-5.3	-5.3	-5.2	-5.5	-4.8	-4.7
	MT3	-7.2	-10.1	-8.7	-5.6	-7.4	-5.4	-3.9	-5.7	-6.6	-6.4	-6.0	-5.8	-3.8	-2.7	-2.8	-2.5	-2.5
	HT1	-4.7	-3.6	-4.7	-4.5	-3.9	-3.6	-3.6	-2.6	-2.0	-2.6	-2.2	-1.1	-1.9	-2.4	-2.7	-3.0	-2.2
	HT2	-1.1	-1.4	-1.5	-0.9	-1.0	-1.5	-1.7	-1.9	-1.3	-1.4	-0.4	-0.6	-1.1	-1.7	-1.1	-1.1	-1.7
	MT	-14.1	-15.6	-14.3	-11.2	-13.7	-10.1	-9.7	-14.6	-14.3	-13.5	-12.3	-11.7	-9.7	-8.1	-8.3	-7.3	-7.3
	HT	-5.8	-5.0	-6.2	-5.4	-4.9	-5.2	-5.3	-4.5	-3.4	-4.0	-2.6	-1.7	-3.0	-4.1	-3.8	-4.1	-3.9
	MHT	-20.0	-20.7	-20.5	-16.6	-18.6	-15.3	-14.9	-19.1	-17.7	-17.5	-14.9	-13.5	-12.7	-12.3	-12.1	-11.4	-11.2
	D_c	*70.2*	*73.3*	*74.7*	*72.2*	*69.3*	*66.4*	*65.6*	*70.6*	*73.0*	*71.4*	*67.0*	*67.0*	*66.2*	*65.0*	*62.5*	*61.0*	*61.6*
	P_c	*29.1*	*31.1*	*31.6*	*31.2*	*29.4*	*28.5*	*28.3*	*30.3*	*30.6*	*30.0*	*28.2*	*28.2*	*28.0*	*27.6*	*26.3*	*25.4*	*25.4*
South Korea	Product group J																	
	RB1	-1.8	-1.4	-1.5	-1.8	-1.9	-1.7	-1.9	-2.0	-2.7	-2.1	-2.3	-1.5	-1.6	-0.9	-1.1	-1.0	-1.1
	RB2	-4.7	-4.6	-5.3	-5.4	-5.5	-6.5	-5.1	-4.6	-4.3	-3.8	-4.1	-3.1	-2.5	-1.6	-2.1	-1.6	-2.4
	LT1	10.5	12.0	11.4	11.0	11.1	10.7	9.3	7.6	6.2	4.7	3.2	2.7	2.8	2.6	2.6	2.2	1.7
	LT2	2.9	3.7	3.3	3.0	2.9	3.1	2.0	2.6	2.8	1.6	1.0	0.8	0.7	1.8	0.9	0.6	0.5
	MT1	0.4	1.2	1.7	2.1	1.1	0.8	0.8	1.1	2.1	2.1	2.8	3.6	3.7	3.3	3.7	3.6	4.1
	MT2	-0.9	-1.4	-1.6	-0.9	-0.4	0.0	0.5	1.0	0.6	0.7	1.1	1.0	0.8	-0.4	-0.4	-0.1	-0.2
	MT3	-1.7	-5.6	-5.8	-5.3	-6.2	-5.9	-5.2	-4.6	-3.9	-4.1	-4.5	-4.1	-2.9	-0.8	-0.8	-1.3	0.5
	HT1	-1.9	-1.2	0.1	0.5	2.0	2.3	3.1	2.5	2.9	4.6	6.4	4.4	2.5	-0.8	-0.5	1.0	0.4
	HT2	-2.8	-2.5	-2.5	-3.2	-3.3	-2.9	-3.5	-3.6	-3.8	-3.6	-3.7	-3.8	-3.4	-3.2	-2.4	-3.4	-3.7
	MT	-2.2	-5.9	-5.7	-4.1	-5.5	-5.1	-3.9	-2.4	-1.1	-1.3	-0.6	0.6	1.5	2.1	2.5	2.2	4.4
	HT	-4.7	-3.7	-2.3	-2.7	-1.3	-0.6	-0.4	-1.2	-0.9	1.0	2.7	0.6	-1.0	-4.1	-2.9	-2.4	-3.3
	MHT	-6.9	-9.6	-8.0	-6.8	-6.8	-5.6	-4.3	-3.6	-2.0	-0.3	2.1	1.2	0.6	-2.0	-0.3	-0.3	1.2
	D_c	*65.7*	*67.4*	*67.0*	*64.7*	*63.6*	*61.0*	*60.7*	*57.1*	*56.6*	*55.4*	*54.7*	*51.9*	*47.9*	*45.9*	*46.1*	*46.6*	*48.5*
	P_c	*27.5*	*28.8*	*29.0*	*28.2*	*27.6*	*27.0*	*26.5*	*24.7*	*24.3*	*23.9*	*23.7*	*22.0*	*20.1*	*18.6*	*18.5*	*18.5*	*19.7*
Mexico	Product group J																	
	RB1	0.3	3.3	2.8	1.9	0.9	-0.3	0.1	-1.1	-1.4	-1.6	-1.2	-0.9	-0.9	-0.9	-1.0	-0.8	-1.1
	RB2	5.4	5.7	2.1	1.0	1.0	2.3	1.1	-0.4	-0.6	-0.8	-1.3	-1.4	-1.7	-1.5	-1.5	-1.7	-1.7
	LT1	1.2	0.9	1.3	0.8	0.3	0.1	0.0	0.7	0.5	0.2	0.5	0.8	1.3	1.2	1.2	1.1	0.8
	LT2	0.6	1.4	0.5	0.7	-0.5	-1.0	-1.2	-0.8	-0.6	-1.8	-1.9	-2.0	-1.3	-1.7	-1.9	-1.9	-1.7
	MT1	-1.3	2.3	4.8	4.8	3.1	4.7	5.9	0.9	1.3	2.7	4.6	5.7	4.2	4.4	4.6	3.8	4.1
	MT2	-1.3	1.2	2.0	1.6	2.1	1.9	1.9	-0.3	-1.0	-1.0	-0.6	-1.3	-1.5	-1.7	-1.9	-1.6	-2.0
	MT3	-1.9	-5.4	-3.7	-2.1	-1.8	-2.1	-2.4	0.4	1.1	0.4	-0.8	-1.5	-1.5	-2.0	-1.9	-1.3	-1.3
	HT1	-1.4	-7.7	-7.2	-7.2	-4.5	-4.6	-3.8	2.5	2.1	2.9	1.1	1.2	1.9	2.5	2.7	2.9	3.2
	HT2	-1.6	-1.8	-2.6	-1.5	-0.8	-1.1	-1.6	-1.7	-1.5	-1.2	-0.6	-0.6	-0.5	-0.3	-0.5	-0.4	-0.3
	MT	-4.6	-1.9	3.1	4.3	3.5	4.5	5.4	0.9	1.5	2.2	3.3	2.9	1.2	0.7	0.8	0.8	0.8
	HT	-2.9	-9.5	-9.8	-8.7	-5.2	-5.7	-5.4	0.7	0.7	1.7	0.6	0.6	1.5	2.2	2.2	2.5	2.9
	MHT	-7.5	-11.4	-6.6	-4.4	-1.8	-1.2	0.0	1.7	2.2	4.0	3.8	3.5	2.7	2.9	3.0	3.4	3.7
	D_c	*58.5*	*66.7*	*70.3*	*60.7*	*50.2*	*50.8*	*49.6*	*41.3*	*42.9*	*43.6*	*47.3*	*47.2*	*46.0*	*46.1*	*48.2*	*47.9*	*47.8*
	P_c	*23.2*	*28.1*	*29.8*	*25.8*	*20.6*	*21.5*	*20.6*	*16.0*	*16.4*	*17.1*	*19.0*	*18.6*	*18.0*	*18.2*	*18.8*	*18.4*	*18.1*

Appendix continues

LAFAY $[J]_c$ indexes, dissimilarity index (D_c), and polarization index (P_c) for 16 emerging economies and G7 countries (con't)

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Taiwan	Product group J																	
	RB1	-0.8	-1.1	-1.6	-1.1	-1.4	-2.0	-2.3	-2.3	-1.8	-2.1	-2.0	-1.8	-1.9	-1.5	-1.2	-1.1	-1.3
	RB2	-3.5	-4.3	-3.8	-3.8	-4.0	-4.2	-4.1	-3.8	-5.0	-3.7	-3.7	-3.4	-3.1	-2.9	-5.8	-3.0	-2.5
	LT1	11.0	10.6	9.6	9.3	8.7	7.7	7.3	6.3	5.4	4.8	4.3	3.7	3.9	3.7	3.4	2.6	2.3
	LT2	5.5	6.4	7.0	5.5	6.0	5.6	5.1	5.3	4.3	4.2	3.4	3.7	3.9	4.4	4.8	4.1	3.7
	MT1	-0.2	-0.6	-1.1	-2.7	-2.9	-2.1	-1.5	-2.5	-1.8	-1.7	-1.2	-0.6	-0.5	-0.2	0.3	0.0	-0.1
	MT2	-3.3	-3.6	-3.7	-2.7	-2.6	-1.5	-1.7	-1.4	-1.1	-0.4	0.1	-0.5	-0.7	-0.6	-0.7	-0.7	-0.3
	MT3	-4.7	-3.2	-3.6	-3.3	-2.9	-2.6	-1.8	-1.3	-0.2	-0.9	-1.1	-1.3	-1.5	-2.8	-1.9	-2.9	-1.9
	HT1	-1.2	-2.5	-1.6	0.1	0.7	0.9	1.3	2.0	2.8	2.5	2.9	3.0	3.5	4.2	5.2	5.0	3.9
	HT2	-2.9	-1.8	-1.3	-1.2	-1.7	-1.7	-2.4	-2.3	-2.6	-2.6	-2.7	-2.8	-3.6	-4.4	-4.0	-4.1	-3.8
	MT	-8.1	-7.4	-8.3	-8.7	-8.3	-6.2	-4.9	-5.2	-3.2	-3.0	-2.2	-2.4	-2.7	-3.6	-2.4	-3.6	-2.3
	HT	-4.1	-4.3	-2.9	-1.1	-1.0	-0.8	-1.1	-0.3	0.3	-0.1	0.2	0.2	-0.1	-0.2	1.2	0.9	0.1
	MHT	-12.2	-11.7	-11.2	-9.9	-9.3	-7.0	-6.0	-5.5	-2.9	-3.1	-2.0	-2.2	-2.8	-3.8	-1.1	-2.6	-2.2
	D_c	*61.3*	*61.7*	*63.1*	*58.7*	*59.4*	*54.4*	*55.9*	*56.7*	*55.2*	*52.0*	*51.0*	*48.9*	*48.8*	*49.4*	*50.3*	*45.7*	*42.9*
	P_c	*25.0*	*25.7*	*26.4*	*24.9*	*25.3*	*23.3*	*23.7*	*23.8*	*23.1*	*21.3*	*21.1*	*19.9*	*19.8*	*19.9*	*20.6*	*18.0*	*26.3*
Singapore	Product group J																	
	RB1	-0.3	-0.3	-0.3	-0.3	-0.3	-0.5	0.0	-0.2	-0.2	-0.3	-0.3	-0.4	-0.3	-0.3	-0.4	-0.4	-0.5
	RB2	10.5	8.0	5.1	4.2	5.6	6.9	6.0	4.6	4.4	3.4	1.9	2.1	1.6	2.3	2.5	2.0	1.1
	LT1	-0.4	-0.2	0.2	0.1	-0.1	-0.2	-0.2	-0.5	-0.5	-0.6	-0.4	-0.3	-0.2	0.0	-0.2	-0.2	-0.2
	LT2	-2.6	-2.4	-2.1	-2.4	-2.5	-2.6	-2.6	-2.6	-2.8	-2.7	-2.6	-2.5	-2.5	-2.4	-1.7	-1.1	-1.0
	MT1	-0.9	-0.6	-0.9	-0.9	-0.8	-1.0	-0.8	-0.6	-0.8	-0.7	-0.7	-0.6	-0.6	-0.4	-0.4	-0.7	-0.7
	MT2	-1.7	-1.6	-1.4	-1.2	-1.2	-1.4	-1.3	-1.4	-1.2	-1.2	-1.3	-0.9	-0.9	-0.7	-0.6	-0.4	-0.2
	MT3	-2.5	-2.5	-2.1	-2.2	-2.6	-3.7	-3.5	-3.0	-3.0	-2.7	-2.9	-3.4	-3.7	-3.8	-3.9	-3.5	-2.7
	HT1	0.1	1.6	2.8	3.6	3.6	3.8	4.0	5.3	5.8	6.2	7.5	7.7	8.5	7.3	6.3	5.3	6.5
	HT2	-2.1	-1.9	-1.3	-1.0	-1.6	-1.3	-1.7	-1.6	-1.8	-1.4	-1.1	-1.8	-2.0	-2.0	-1.5	-1.1	-2.3
	MT	-5.1	-4.8	-4.4	-4.3	-4.7	-6.1	-5.5	-5.1	-5.0	-4.6	-4.9	-4.9	-5.1	-4.9	-4.9	-4.6	-3.6
	HT	-2.0	-0.3	1.5	2.6	2.0	2.5	2.3	3.7	4.0	4.9	6.3	5.9	6.5	5.3	4.8	4.3	4.2
	MHT	-7.1	-5.1	-2.9	-1.7	-2.7	-3.6	-3.2	-1.3	-0.9	0.2	1.4	1.0	1.4	0.4	-0.2	-0.3	0.6
	D_c	*46.6*	*44.8*	*42.2*	*40.4*	*42.6*	*44.3*	*43.2*	*42.8*	*43.5*	*39.4*	*37.1*	*37.5*	*35.9*	*36.4*	*33.2*	*30.5*	*30.7*
	P_c	*17.8*	*17.3*	*15.9*	*15.7*	*16.3*	*17.5*	*16.9*	*16.6*	*16.4*	*14.8*	*13.6*	*13.2*	*12.5*	*12.8*	*11.8*	*10.6*	*10.8*
Malaysia	Product group J																	
	RB1	19.1	16.1	16.5	15.2	14.1	11.8	9.8	9.2	8.6	7.7	6.5	6.1	5.6	5.3	4.3	3.1	2.9
	RB2	-0.3	-1.7	-1.7	-1.6	-1.6	-1.8	-1.9	-2.2	-2.2	-1.2	-1.2	-1.5	-1.6	-1.6	-1.2	-1.1	-1.0
	LT1	1.0	1.1	1.0	1.4	1.4	1.9	1.7	1.6	1.5	1.2	1.2	1.4	1.3	1.5	1.0	0.9	0.9
	LT2	-3.6	-2.8	-2.3	-2.6	-1.8	-1.2	-1.0	-1.0	-1.0	-0.8	-1.1	-0.8	-1.1	-0.2	-0.6	-0.3	0.0
	MT1	-3.0	-1.7	-1.6	-1.8	-2.4	-2.4	-2.1	-1.4	-1.3	-1.1	-1.3	-1.9	-1.7	-0.1	-0.7	-0.8	-1.0
	MT2	-3.5	-3.9	-3.8	-3.7	-3.5	-3.4	-2.8	-2.8	-2.4	-1.8	-1.3	-1.2	-1.0	-0.8	-1.3	-0.6	-0.7
	MT3	-8.7	-5.4	-4.5	-5.4	-5.1	-5.5	-5.1	-5.4	-5.7	-5.7	-4.7	-4.2	-4.8	-2.9	-3.1	-3.5	-3.0
	HT1	0.6	0.4	-1.8	-0.1	1.2	3.6	3.5	4.3	4.5	3.1	3.7	3.2	4.6	0.5	2.8	2.9	2.9
	HT2	-1.6	-2.0	-1.7	-1.4	-2.4	-3.0	-2.1	-2.4	-2.0	-1.5	-1.7	-1.0	-1.3	-1.7	-1.3	-0.8	-1.1
	MT	-15.3	-11.0	-9.9	-10.9	-10.9	-11.3	-10.0	-9.6	-9.4	-8.5	-7.4	-7.3	-7.4	-3.8	-5.0	-4.8	-4.7
	HT	-1.0	-1.6	-3.5	-1.5	-1.2	0.6	1.5	1.9	2.5	1.6	2.0	2.1	3.3	-1.2	1.5	2.1	1.9
	MHT	-16.3	-12.7	-13.4	-12.4	-12.1	-10.7	-8.6	-7.7	-6.9	-6.9	-5.4	-5.2	-4.2	-4.9	-3.6	-2.7	-2.8
	D_c	*69.5*	*62.3*	*60.2*	*59.6*	*59.9*	*60.0*	*56.7*	*56.5*	*55.6*	*52.7*	*52.5*	*51.1*	*49.9*	*49.1*	*50.4*	*52.0*	*49.3*
	P_c	*30.6*	*26.8*	*25.7*	*25.5*	*25.7*	*26.0*	*24.2*	*23.5*	*22.2*	*20.6*	*20.9*	*20.3*	*19.6*	*18.9*	*19.4*	*19.7*	*18.0*

Appendix continues

LAFAY [*J*]$_c$ indexes, dissimilarity index (D_c), and polarization index (P_c) for 16 emerging economies and G7 countries (con't)

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Thailand	Product group J																	
	RB1	9.8	9.7	7.9	7.3	6.8	5.6	4.9	4.3	3.3	3.4	3.3	4.0	4.0	4.1	4.0	3.3	3.8
	RB2	-1.9	-1.9	-3.1	-2.1	-3.0	-3.4	-4.0	-2.4	-2.4	-2.0	-1.8	-1.4	-0.4	-1.1	-1.1	-0.7	-0.5
	LT1	10.8	10.9	13.4	12.4	11.6	11.1	11.4	10.3	9.7	9.3	8.7	6.6	6.0	5.3	4.5	4.0	4.2
	LT2	-2.0	-0.6	0.1	-0.6	0.1	0.2	0.0	-0.1	1.0	0.0	0.3	-0.6	-1.0	-0.9	-1.2	-0.4	-0.3
	MT1	-2.8	-2.7	-3.3	-3.1	-3.4	-3.7	-2.7	-3.2	-3.9	-3.3	-3.6	-3.3	-1.3	0.5	0.3	0.2	0.5
	MT2	-4.1	-4.4	-4.5	-3.7	-3.4	-2.7	-2.1	-3.0	-2.8	-3.0	-2.3	-2.4	-2.3	-2.7	-2.8	-1.9	-2.0
	MT3	-3.7	-2.4	-7.6	-8.0	-8.2	-7.4	-8.2	-6.3	-6.4	-6.4	-6.6	-6.6	-6.6	-4.4	-3.1	-3.4	-3.8
	HT1	-3.5	-5.1	0.6	0.5	1.1	2.8	2.8	3.1	2.6	2.9	3.3	4.5	3.4	2.4	2.0	0.4	0.1
	HT2	-2.7	-3.6	-3.4	-2.6	-1.5	-2.5	-2.0	-2.7	-1.1	-0.9	-1.3	-0.8	-1.8	-3.2	-2.6	-1.5	-1.8
	MT	-10.5	-9.5	-15.5	-14.9	-15.0	-13.8	-13.0	-12.6	-13.1	-12.7	-12.5	-12.3	-10.2	-6.6	-5.6	-5.2	-5.4
	HT	-6.2	-8.7	-2.8	-2.1	-0.4	0.2	0.7	0.4	1.5	2.0	2.0	3.7	1.6	-0.7	-0.6	-1.1	-1.7
	MHT	-16.7	-18.2	-18.3	-17.0	-15.4	-13.5	-12.3	-12.2	-11.6	-10.7	-10.4	-8.6	-8.6	-7.3	-6.3	-6.2	-7.1
	D_c	*79.8*	*80.2*	*79.0*	*71.0*	*69.1*	*69.4*	*70.5*	*68.1*	*65.0*	*61.6*	*61.6*	*57.8*	*56.1*	*56.7*	*56.1*	*51.9*	*53.1*
	P_c	*35.8*	*35.9*	*34.9*	*31.0*	*29.8*	*30.4*	*29.3*	*28.8*	*26.5*	*25.0*	*25.4*	*23.5*	*22.2*	*23.3*	*22.7*	*20.3*	*21.0*
Indonesia	Product group J																	
	RB1	14.1	8.4	15.5	15.7	15.0	13.4	12.6	10.7	13.8	12.9	11.6	10.9	12.6	9.2	7.3	5.3	6.2
	RB2	7.6	1.8	5.1	3.7	1.6	1.6	2.1	1.8	-0.2	-0.1	1.1	1.5	0.9	0.3	-3.3	-2.3	-2.6
	LT1	9.0	10.3	10.1	9.5	9.6	12.1	12.9	13.3	11.5	10.0	9.5	9.1	7.6	6.1	6.5	6.3	6.9
	LT2	-3.7	-2.2	-1.2	-0.6	0.8	0.0	-0.1	-0.2	0.4	1.3	0.7	1.1	0.7	1.9	1.1	0.6	1.1
	MT1	-2.9	-4.2	-3.7	-3.2	-2.9	-3.5	-2.5	-2.0	-2.0	-3.4	-3.6	-3.1	-3.2	-1.3	-1.5	-3.5	-3.3
	MT2	-5.1	-4.9	-5.8	-5.9	-5.0	-3.3	-2.2	-2.5	-3.3	-3.9	-3.6	-2.8	-2.4	-2.6	-3.3	-2.8	-2.8
	MT3	-13.4	-12.0	-13.5	-13.9	-13.7	-14.7	-16.4	-14.5	-14.0	-14.7	-13.9	-14.1	-13.9	-12.5	-7.5	-7.8	-8.6
	HT1	-3.1	-4.1	-4.1	-3.5	-3.4	-3.2	-3.5	-3.0	-2.6	-0.6	-0.3	-0.2	0.4	1.3	1.9	5.3	4.2
	HT2	-2.4	-2.2	-2.6	-1.8	-1.9	-2.6	-3.0	-3.5	-3.5	-1.6	-1.5	-2.4	-2.6	-2.5	-1.2	-1.0	-0.9
	MT	-21.4	-21.1	-23.0	-22.9	-21.6	-21.4	-21.1	-19.0	-19.3	-21.9	-21.1	-20.1	-19.5	-16.3	-12.3	-14.1	-14.8
	HT	-5.6	-6.2	-6.7	-5.3	-5.4	-5.7	-6.5	-6.5	-6.2	-2.2	-1.8	-2.6	-2.2	-1.2	0.7	4.2	3.3
	MHT	-27.0	-27.4	-29.6	-28.3	-27.0	-27.2	-27.6	-25.5	-25.5	-24.1	-22.9	-22.7	-21.7	-17.5	-11.6	-9.9	-11.5
	D_c	*92.5*	*91.3*	*91.4*	*89.2*	*85.7*	*85.4*	*86.1*	*85.6*	*87.8*	*85.3*	*81.9*	*81.0*	*77.0*	*70.4*	*65.3*	*66.3*	*67.1*
	P_c	*39.5*	*39.7*	*39.2*	*38.6*	*36.8*	*37.2*	*37.5*	*36.8*	*37.3*	*36.5*	*35.0*	*34.4*	*32.4*	*29.4*	*27.1*	*27.7*	*46.1*
Brazil	Product group J																	
	RB1	6.1	6.8	6.8	6.0	4.6	6.8	5.5	6.1	6.1	7.8	9.5	8.2	7.8	8.3	9.4	6.9	7.8
	RB2	1.9	1.0	0.7	-0.4	0.8	2.7	1.6	0.2	0.1	1.0	0.2	2.0	2.2	2.8	2.2	1.9	1.2
	LT1	3.5	4.6	4.6	4.0	3.5	3.7	3.9	4.1	4.4	3.7	2.8	2.9	2.6	2.3	2.6	2.7	3.0
	LT2	2.1	2.5	2.0	3.1	2.4	2.3	3.4	3.6	3.5	2.9	1.7	1.1	0.7	0.7	1.1	1.0	0.9
	MT1	1.0	0.4	2.4	2.0	1.9	1.1	0.9	1.5	-0.2	-1.9	-3.3	-1.0	-0.1	-0.1	0.7	0.6	0.8
	MT2	-1.3	-1.3	-1.2	0.7	1.3	-0.1	0.6	0.3	0.2	-0.4	1.0	0.8	0.9	0.2	-0.6	-0.5	-0.8
	MT3	-4.5	-4.4	-5.0	-4.8	-4.7	-5.8	-4.4	-4.6	-3.8	-3.7	-3.6	-4.0	-4.6	-5.4	-5.7	-4.8	-6.0
	HT1	-5.2	-6.6	-6.7	-7.0	-5.7	-6.0	-5.1	-6.1	-6.5	-6.9	-6.0	-7.3	-7.1	-6.8	-7.3	-7.4	-6.4
	HT2	-3.5	-3.3	-3.6	-3.7	-3.9	-4.7	-6.5	-5.1	-3.8	-2.7	-2.4	-2.5	-2.3	-2.1	-2.3	-0.3	-0.6
	MT	-4.8	-5.2	-3.9	-2.0	-1.6	-4.8	-2.9	-2.8	-3.8	-6.0	-5.9	-4.3	-3.9	-5.3	-5.6	-4.7	-6.0
	HT	-8.8	-9.9	-10.3	-10.7	-9.6	-10.8	-11.6	-11.2	-10.2	-9.6	-8.4	-9.9	-9.4	-8.9	-9.7	-7.7	-7.0
	MHT	-13.5	-15.1	-14.1	-12.7	-11.2	-15.5	-14.5	-14.0	-14.0	-15.5	-14.3	-14.1	-13.3	-14.1	-15.3	-12.4	-12.9
	D_c	*59.7*	*69.6*	*69.4*	*65.6*	*64.2*	*68.1*	*65.3*	*61.3*	*61.5*	*61.8*	*60.9*	*58.6*	*54.0*	*54.6*	*56.4*	*55.7*	*55.8*
	P_c	*24.1*	*29.0*	*28.8*	*27.6*	*27.2*	*29.3*	*28.6*	*26.2*	*26.3*	*26.9*	*27.2*	*26.5*	*24.2*	*24.3*	*25.4*	*25.0*	*24.7*

Appendix continues

LAFAY [*J*]$_c$ indexes, dissimilarity index (D_c), and polarization index (P_c) for 16 emerging countries and G7 countries (con't)

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Philippines	Product group J																	
	RB1	17.3	13.7	7.2	10.8	6.2	8.1	7.4	6.4	4.8	2.9	3.3	0.2	0.4	0.2	-1.4	-1.2	-1.3
	RB2	-0.2	0.6	-1.4	1.6	0.8	0.7	-0.1	-0.7	-1.8	-1.7	-1.1	-1.4	-1.3	-2.1	-1.8	-2.0	-2.3
	LT1	3.3	2.7	6.6	4.1	8.6	5.9	5.4	5.9	5.7	5.4	5.0	5.6	4.3	3.2	1.9	2.1	2.5
	LT2	0.4	0.1	-0.4	1.1	-0.2	2.0	1.7	1.5	2.2	1.9	0.9	-0.9	-1.2	-1.1	-1.8	-1.7	-1.9
	MT1	-0.7	-0.7	-1.9	-2.0	-3.1	-2.8	-2.4	-2.3	-2.1	-1.5	-1.9	-2.2	-1.5	-0.5	-0.8	-0.9	-0.8
	MT2	-6.8	-5.3	-7.2	-5.7	-4.8	-4.6	-4.2	-4.6	-3.3	-3.4	-4.0	-3.4	-3.4	-3.4	-3.5	-3.6	-3.4
	MT3	-7.7	-7.1	-5.7	-6.9	-6.1	-6.5	-5.2	-4.8	-4.7	-5.3	-4.9	-5.5	-5.3	-4.3	-3.1	-2.9	-3.0
	HT1	-3.2	-1.6	5.3	-0.8	1.2	0.0	0.2	1.3	2.5	3.6	4.8	9.8	10.7	9.9	11.8	11.5	11.0
	HT2	-2.4	-2.4	-2.6	-2.3	-2.7	-2.9	-2.7	-2.6	-3.4	-1.9	-2.2	-2.2	-2.6	-1.9	-1.2	-1.4	-0.9
	MT	-15.2	-13.1	-14.8	-14.6	-14.0	-13.9	-11.9	-11.7	-10.0	-10.3	-10.7	-11.2	-10.1	-8.2	-7.5	-7.3	-7.2
	HT	-5.6	-4.0	2.8	-3.1	-1.5	-2.9	-2.5	-1.3	-0.8	1.7	2.6	7.7	8.0	8.0	10.5	10.1	10.1
	MHT	-20.8	-17.1	-12.0	-17.7	-15.4	-16.8	-14.4	-13.0	-10.9	-8.6	-8.1	-3.6	-2.1	-0.2	3.0	2.8	3.0
	D_c	*85.4*	*82.5*	*80.9*	*77.7*	*72.2*	*70.6*	*68.2*	*68.5*	*64.8*	*61.1*	*60.5*	*61.0*	*57.8*	*50.9*	*51.1*	*53.5*	*52.7*
	P_c	*40.8*	*38.3*	*41.6*	*37.3*	*39.5*	*35.9*	*34.0*	*34.6*	*32.4*	*31.0*	*30.0*	*30.4*	*27.6*	*23.4*	*22.4*	*24.1*	*24.1*
India	Product group J																	
	RB1	-4.1	-3.2	-5.1	-4.0	-1.6	-2.6	-1.8	-1.3	-0.9	-3.4	-1.9	-1.8	-3.1	-4.8	-4.7	-3.6	-2.9
	RB2	5.0	7.7	6.1	5.0	8.1	1.3	-2.5	-3.2	0.4	-0.4	0.0	-1.6	-3.1	-2.6	-3.6	-1.7	1.9
	LT1	18.1	19.0	21.3	18.0	17.5	19.4	19.4	19.5	17.9	18.8	18.0	18.3	18.2	18.7	17.4	15.7	15.4
	LT2	-1.8	-1.8	-2.4	-2.4	-2.0	-1.1	-0.5	0.5	-0.5	0.5	0.8	1.5	1.7	2.6	2.6	2.4	1.6
	MT1	-0.4	-0.4	-0.1	0.0	-0.3	0.3	0.7	0.9	0.9	1.0	0.7	0.2	0.5	0.6	0.2	0.3	-0.2
	MT2	-6.1	-5.2	-3.8	-3.6	-4.6	-3.8	-4.9	-4.2	-2.6	-2.9	-3.4	-2.5	-2.1	-2.4	-1.9	-0.4	-1.2
	MT3	-7.1	-10.0	-8.7	-7.4	-9.1	-7.7	-6.4	-7.2	-8.4	-7.6	-8.5	-8.7	-7.2	-6.5	-5.6	-5.8	-6.4
	HT1	-2.2	-3.5	-4.6	-3.6	-4.0	-2.8	-2.5	-2.7	-2.4	-3.2	-3.7	-3.4	-3.7	-3.8	-4.0	-5.7	-6.1
	HT2	-1.5	-2.6	-2.8	-2.0	-4.0	-3.0	-1.6	-2.3	-4.3	-2.8	-1.9	-2.1	-1.3	-1.7	-0.5	-1.1	-2.0
	MT	-13.6	-15.6	-12.6	-11.0	-14.0	-11.1	-10.5	-10.5	-10.1	-9.6	-11.2	-10.9	-8.8	-8.3	-7.3	-6.0	-7.8
	HT	-3.7	-6.1	-7.3	-5.6	-8.0	-5.8	-4.1	-4.9	-6.7	-5.9	-5.6	-5.5	-5.0	-5.5	-4.5	-6.8	-8.1
	MHT	-17.3	-21.7	-19.9	-16.5	-22.1	-17.0	-14.6	-15.4	-16.9	-15.5	-16.9	-16.4	-13.8	-13.8	-11.8	-12.8	-15.9
	D_c	*73.1*	*79.2*	*80.6*	*75.0*	*76.1*	*73.4*	*68.6*	*68.3*	*72.0*	*71.3*	*69.1*	*67.0*	*64.4*	*68.1*	*63.4*	*59.2*	*62.3*
	P_c	*31.6*	*34.0*	*34.4*	*32.2*	*32.2*	*31.8*	*29.3*	*29.1*	*30.4*	*30.3*	*29.4*	*28.7*	*27.8*	*30.1*	*27.8*	*25.4*	*26.5*
Poland	Product group J																	
	RB1	-0.4	0.4	1.0	0.2	0.5	1.0	2.0	3.0	3.1	3.9	3.2	3.4	4.3	3.4	2.9	2.7	2.2
	RB2	-2.9	-2.1	-1.3	-0.8	0.2	0.0	2.3	1.7	0.3	0.0	-0.2	-0.5	-0.3	-0.2	-0.5	-0.4	-0.2
	LT1	1.1	1.6	2.0	1.1	-0.9	-0.9	-0.5	0.5	3.8	3.0	2.7	3.0	2.9	2.6	2.4	1.5	0.7
	LT2	1.8	3.0	3.0	3.2	3.4	4.7	5.4	3.6	4.2	4.6	5.3	5.5	5.8	5.0	4.9	4.6	4.5
	MT1	-1.4	-1.3	-1.8	-0.9	-1.5	-0.7	-4.2	-1.2	-1.1	-0.9	-1.1	-1.9	-2.4	-1.6	-0.8	0.3	0.2
	MT2	-4.2	-3.9	-3.9	-3.2	-2.3	1.2	1.1	-0.3	-2.9	-3.3	-3.2	-3.1	-2.3	-3.0	-3.0	-2.6	-3.0
	MT3	3.5	0.6	0.1	-0.1	0.2	-2.5	-2.0	-2.5	-2.2	-2.4	-2.3	-2.6	-4.3	-2.5	-1.8	-0.3	0.7
	HT1	2.4	1.7	1.3	1.2	1.3	-2.0	-4.2	-3.1	-3.3	-2.9	-2.5	-2.4	-1.9	-1.8	-2.2	-2.9	-2.6
	HT2	0.2	-0.1	-0.5	-0.7	-0.9	-1.0	0.1	-1.8	-1.9	-2.1	-1.7	-1.5	-1.8	-1.8	-2.0	-2.7	-2.6
	MT	-2.1	-4.5	-5.6	-4.2	-3.6	-1.9	-5.1	-3.9	-6.2	-6.6	-6.6	-7.6	-9.0	-7.1	-5.6	-2.6	-2.1
	HT	2.6	1.7	0.9	0.5	0.4	-2.9	-4.1	-4.9	-5.2	-4.9	-4.2	-3.9	-3.7	-3.7	-4.3	-5.7	-5.2
	MHT	0.5	-2.9	-4.8	-3.7	-3.2	-4.8	-9.2	-8.8	-11.4	-11.6	-10.9	-11.5	-12.7	-10.8	-9.9	-8.3	-7.3
	D_c	*43.9*	*45.0*	*48.7*	*46.5*	*46.8*	*49.5*	*55.4*	*54.0*	*58.3*	*58.6*	*54.5*	*52.1*	*50.0*	*49.4*	*46.7*	*47.1*	*47.1*
	P_c	*20.9*	*20.3*	*21.2*	*20.6*	*20.8*	*23.3*	*25.9*	*23.6*	*25.2*	*25.5*	*23.9*	*22.3*	*21.1*	*20.7*	*19.5*	*19.8*	*19.4*

Appendix continues

LAFAY [*J*]$_c$ indexes, dissimilarity index (D_c), and polarization index (P_c) for 16 emerging economies and G7 countries (con't)

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Hungary	Product group J																	
	RB1	1.8	1.8	2.5	2.2	3.1	3.5	4.2	2.6	1.8	1.6	1.6	4.0	2.1	1.4	0.7	0.4	0.3
	RB2	1.8	1.3	2.2	1.7	2.1	1.9	1.7	2.6	2.9	2.5	2.4	0.9	-0.1	0.1	-0.1	-0.2	0.0
	LT1	2.1	2.3	2.8	2.0	1.7	0.6	1.8	5.9	4.2	4.1	2.6	2.4	0.5	0.6	0.5	0.3	0.1
	LT2	-0.4	0.7	0.7	1.3	1.4	2.1	1.4	0.8	1.3	0.5	0.3	0.7	-1.3	-1.7	-1.6	-1.6	-0.9
	MT1	-0.5	0.2	-0.9	0.8	-1.5	-0.6	-2.6	-2.7	-2.9	-2.8	-2.1	-1.6	-0.5	-1.0	-0.2	0.0	0.3
	MT2	-3.0	-4.3	-3.5	-3.1	-2.5	-0.9	-1.3	-1.5	-1.5	-1.2	-1.5	-1.3	-1.7	-1.9	-1.6	-1.1	-1.2
	MT3	-5.5	-5.9	-7.3	-5.9	-5.0	-6.2	-4.1	-3.8	-3.0	-2.9	-2.1	-2.6	-0.5	1.0	0.3	0.8	0.6
	HT1	0.0	0.3	0.0	-1.2	-1.2	-2.1	-1.9	-2.7	-1.5	-1.2	-0.4	-1.6	2.3	2.8	3.2	2.4	1.6
	HT2	3.7	3.7	3.6	2.3	1.9	1.8	0.8	-1.3	-1.1	-0.6	-0.8	-0.9	-0.9	-1.2	-1.2	-0.9	-0.9
	MT	-9.0	-10.0	-11.7	-8.3	-9.0	-7.7	-8.1	-8.0	-7.5	-6.8	-5.7	-5.4	-2.6	-1.9	-1.5	-0.3	-0.2
	HT	3.8	4.0	3.6	1.1	0.7	-0.3	-1.1	-4.0	-2.6	-1.8	-1.2	-2.6	1.4	1.6	2.0	1.4	0.7
	MHT	-5.2	-6.0	-8.1	-7.2	-8.3	-8.0	-9.2	-12.0	-10.0	-8.6	-6.9	-8.0	-1.2	-0.3	0.5	1.1	0.5
	D_c	*55.5*	*55.1*	*56.7*	*56.9*	*55.4*	*53.8*	*52.8*	*54.8*	*50.7*	*46.7*	*45.7*	*46.5*	*44.5*	*44.9*	*45.8*	*44.7*	*44.5*
	P_c	*22.6*	*23.0*	*23.6*	*24.3*	*23.2*	*22.9*	*22.1*	*22.9*	*20.7*	*18.6*	*18.2*	*18.6*	*17.2*	*17.5*	*17.8*	*16.9*	*16.5*
Turkey	Product group J																	
	RB1	2.1	2.5	1.2	0.5	-0.2	-1.2	1.1	1.7	1.6	2.6	2.0	2.2	2.6	1.5	1.1	0.9	1.2
	RB2	-2.6	-2.7	-3.6	-2.9	-4.1	-2.2	-2.5	-2.0	-2.1	-3.3	-2.6	-2.5	-2.2	-2.2	-1.9	-2.4	-2.4
	LT1	17.5	19.0	20.1	18.9	21.2	20.7	20.7	21.0	19.1	19.4	18.7	17.7	17.6	18.4	17.5	16.4	14.9
	LT2	4.7	3.8	1.6	2.3	1.2	2.4	1.4	1.1	2.3	3.1	0.8	1.9	2.1	1.7	2.1	2.1	2.1
	MT1	-3.0	-2.1	-2.0	-1.6	-1.1	-2.8	-2.4	-3.0	-3.4	-1.7	-1.4	-2.1	-4.0	-3.1	-1.4	-3.4	1.1
	MT2	-2.4	-1.0	-3.3	0.0	-0.9	-1.0	-1.8	-2.3	-1.8	-3.0	-2.4	-2.4	-2.3	-2.3	-3.1	-2.5	-3.7
	MT3	-8.4	-11.1	-6.5	-8.6	-9.2	-10.1	-9.9	-9.5	-8.8	-8.7	-8.2	-9.4	-8.5	-7.7	-5.8	-4.1	-6.3
	HT1	-4.7	-5.7	-5.0	-4.9	-4.3	-3.4	-3.9	-3.4	-2.9	-3.8	-2.9	-2.8	-2.9	-3.2	-5.6	-5.1	-3.6
	HT2	-3.0	-2.5	-2.5	-3.7	-2.6	-2.4	-2.7	-3.7	-4.0	-4.5	-3.9	-2.6	-2.4	-3.1	-3.0	-1.8	-3.2
	MT	-13.9	-14.3	-11.7	-10.2	-11.2	-13.8	-14.2	-14.7	-14.0	-13.4	-12.0	-13.9	-14.8	-13.1	-10.3	-10.1	-8.9
	HT	-7.7	-8.2	-7.6	-8.6	-6.9	-5.9	-6.5	-7.1	-6.8	-8.2	-6.8	-5.4	-5.3	-6.3	-8.6	-6.9	-6.9
	MHT	-21.6	-22.5	-19.3	-18.8	-18.1	-19.7	-20.7	-21.8	-20.8	-21.7	-18.8	-19.3	-20.1	-19.4	-18.8	-17.0	-15.8
	D_c	*74.8*	*51.8*	*53.4*	*53.9*	*52.1*	*50.1*	*48.8*	*52.0*	*48.2*	*44.4*	*43.3*	*43.5*	*42.4*	*43.4*	*44.7*	*43.8*	*43.5*
	P_c	*31.9*	*32.4*	*31.2*	*32.9*	*31.5*	*32.1*	*32.4*	*33.0*	*31.6*	*33.9*	*32.1*	*30.5*	*30.1*	*29.9*	*28.8*	*27.8*	*28.3*
Israel	Product group J																	
	RB1	0.1	-1.0	-0.5	-0.8	-1.1	-0.9	-1.7	-1.5	-1.6	-1.8	-2.3	-1.9	-2.3	-2.5	-2.2	-2.0	-2.0
	RB2	4.9	5.8	6.5	4.5	4.5	5.5	7.0	6.5	5.7	6.0	7.7	7.1	6.1	6.3	6.2	5.4	6.4
	LT1	1.0	0.9	1.2	1.3	0.9	1.2	1.6	1.6	0.7	0.7	0.6	0.4	0.0	0.0	0.2	-0.1	0.2
	LT2	1.9	3.7	2.6	-1.1	-1.2	-1.4	-0.9	-0.4	-1.0	-0.7	-0.6	-0.3	-0.7	-0.7	-0.2	-0.4	-0.6
	MT1	-3.4	-4.0	-5.0	-4.7	-3.3	-3.4	-4.5	-5.2	-5.3	-5.0	-4.6	-4.4	-3.9	-3.6	-3.3	-3.9	-3.8
	MT2	1.7	0.2	1.0	0.5	0.1	0.0	0.0	0.0	0.2	0.5	0.1	-0.1	0.0	-0.2	0.1	0.1	-0.7
	MT3	-5.6	-5.0	-4.9	0.1	-0.4	-1.9	-3.5	-1.1	-0.2	-0.4	-2.0	-2.8	-2.8	-1.9	-2.3	-2.5	-2.6
	HT1	-1.6	-0.9	0.0	0.9	0.6	0.3	0.8	1.7	2.0	1.6	0.8	2.0	3.0	3.4	3.3	3.1	2.5
	HT2	0.9	0.3	-0.8	-0.7	-0.2	0.6	1.1	-1.5	-0.6	-0.8	0.2	0.1	0.7	-0.8	-1.9	0.3	0.7
	MT	-7.3	-8.8	-8.9	-4.1	-3.6	-5.3	-8.0	-6.4	-5.3	-5.0	-6.5	-7.3	-6.7	-5.7	-5.5	-6.3	-7.1
	HT	-0.7	-0.6	-0.8	0.2	0.4	0.9	1.9	0.2	1.4	0.8	1.1	2.1	3.7	2.6	1.4	3.4	3.2
	MHT	-7.9	-9.4	-9.7	-4.0	-3.1	-4.4	-6.0	-6.2	-3.9	-4.2	-5.4	-5.2	-3.1	-3.1	-4.1	-2.9	-4.0
	D_c	*55.9*	*52.4*	*51.8*	*41.3*	*41.5*	*43.7*	*48.0*	*49.2*	*48.9*	*45.8*	*44.8*	*44.1*	*42.7*	*44.5*	*43.9*	*39.4*	*41.9*
	P_c	*23.6*	*22.8*	*21.9*	*17.3*	*17.6*	*19.1*	*21.5*	*21.2*	*21.0*	*20.0*	*20.1*	*18.6*	*18.5*	*18.8*	*18.1*	*17.8*	*17.8*

Appendix continues

$LAFAY[J]_c$ indexes, dissimilarity index (D_c), and polarization index (P_c) for 16 emerging economies and G7 countries (con't)

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
South Africa	Product group J																	
	RB1	2.7	3.9	5.5	4.7	4.7	5.1	5.3	5.4	4.9	2.5	3.2	4.9	2.5	4.6	2.8	1.7	0.9
	RB2	17.1	14.4	12.6	15.4	17.0	15.0	13.5	6.5	5.6	13.9	13.6	6.0	13.6	9.1	10.0	17.1	21.4
	LT1	1.0	0.8	0.8	1.0	0.6	0.9	0.8	0.5	0.5	-1.0	-1.1	-0.2	-1.0	-0.6	-1.3	-1.5	-1.6
	LT2	1.5	2.5	2.0	0.9	-0.3	0.4	1.4	5.9	5.8	3.6	2.8	4.7	3.2	3.4	2.2	0.7	0.0
	MT1	-5.2	-6.2	-7.1	-6.9	-7.1	-5.8	-4.9	-2.7	-3.1	-3.6	-4.5	-3.0	-2.6	-0.8	0.5	-1.6	-3.5
	MT2	1.7	1.2	2.8	2.8	3.7	2.2	2.6	0.1	0.6	2.7	3.3	1.9	0.2	0.8	3.0	1.1	-0.1
	MT3	-11.6	-10.0	-9.6	-10.8	-11.9	-11.1	-9.3	-7.7	-6.7	-9.4	-8.7	-7.1	-7.7	-5.7	-5.9	-6.7	-6.5
	HT1	-6.2	-6.9	-5.7	-5.3	-4.8	-4.6	-4.6	-4.8	-4.5	-6.3	-6.1	-5.2	-6.1	-7.7	-7.6	-7.2	-6.5
	HT2	-1.0	0.3	-1.2	-1.8	-2.0	-1.9	-4.8	-3.3	-3.1	-2.4	-2.5	-1.9	-2.1	-3.0	-3.5	-3.6	-4.1
	MT	-15.1	-15.0	-13.9	-14.9	-15.3	-14.8	-11.7	-10.3	-9.1	-10.3	-9.9	-8.2	-10.1	-5.6	-2.5	-7.3	-10.1
	HT	-7.2	-6.5	-6.9	-7.0	-6.7	-6.5	-9.3	-8.1	-7.7	-8.7	-8.6	-7.0	-8.2	-10.7	-11.1	-10.8	-10.6
	MHT	-22.2	-21.6	-20.8	-21.9	-22.0	-21.3	-21.0	-18.4	-16.8	-19.0	-18.5	-15.2	-18.3	-16.4	-13.6	-18.0	-20.7
	D_c	*87.8*	*84.3*	*80.4*	*81.1*	*84.1*	*78.0*	*73.8*	*61.7*	*58.6*	*69.0*	*67.1*	*54.4*	*59.2*	*53.9*	*58.4*	*60.7*	*64.2*
	P_c	*37.9*	*36.7*	*34.6*	*34.8*	*36.4*	*33.7*	*31.9*	*27.2*	*25.5*	*30.9*	*30.1*	*24.0*	*26.8*	*25.0*	*27.2*	*28.2*	*29.4*
G7	Product group J																	
	RB1	-1.4	-1.5	-1.5	-1.4	-1.3	-1.2	-1.2	-1.2	-1.2	-1.0	-1.0	-0.9	-0.8	-0.6	-0.6	-0.5	-0.5
	RB2	-2.8	-1.8	-1.6	-1.3	-1.4	-1.3	-1.1	-0.9	-0.8	-0.7	-0.6	-0.7	-0.7	-0.7	-0.7	-0.9	-0.9
	LT1	-2.1	-2.3	-2.5	-2.4	-2.5	-2.3	-2.5	-2.7	-2.8	-2.7	-2.5	-2.4	-2.5	-2.5	-2.4	-2.4	-2.5
	LT2	0.0	-0.3	-0.4	-0.5	-0.4	-0.4	-0.5	-0.7	-0.7	-0.8	-0.7	-0.6	-0.7	-0.7	-0.6	-0.7	-0.6
	MT1	0.5	0.3	0.5	0.6	0.7	0.6	0.5	0.9	0.9	0.7	0.5	0.4	0.5	0.5	0.5	0.7	0.5
	MT2	1.2	1.1	1.0	1.0	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.9	1.0	0.9	1.0	1.0	1.1
	MT3	2.9	2.8	2.8	2.6	2.8	2.8	2.6	2.6	2.8	2.8	2.8	3.0	2.9	2.5	2.4	2.4	2.4
	HT1	0.7	0.6	0.6	0.6	0.4	0.3	0.2	0.0	-0.1	-0.2	-0.4	-0.7	-0.7	-0.8	-0.8	-0.8	-0.7
	HT2	1.1	1.0	1.0	0.8	0.9	0.9	1.2	1.2	1.2	1.0	1.0	1.1	1.0	1.3	1.2	1.2	1.2
	MT	4.6	4.2	4.4	4.2	4.2	4.1	3.9	4.2	4.5	4.3	4.1	4.3	4.3	3.9	3.9	4.1	4.1
	HT	1.8	1.7	1.6	1.4	1.3	1.2	1.4	1.2	1.1	0.9	0.6	0.4	0.3	0.6	0.4	0.4	0.5
	MHT	6.4	5.9	6.0	5.6	5.5	5.3	5.3	5.4	5.5	5.2	4.7	4.7	4.7	4.5	4.3	4.5	4.5
	D_c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P_c	*8.1*	*7.6*	*7.6*	*7.1*	*7.2*	*6.9*	*7.0*	*7.0*	*7.5*	*7.3*	*7.2*	*7.4*	*7.3*	*7.1*	*7.1*	*7.6*	*7.7*
United States	Product group J																	
	RB1	-0.9	-4.4	0.0	0.3	0.3	0.2	0.2	0.3	0.3	0.5	0.5	0.1	-0.1	-0.1	-0.3	-0.2	-0.3
	RB2	-0.5	0.4	0.3	0.1	0.2	0.3	-0.1	0.1	-0.1	0.0	0.4	-0.1	-0.2	-0.3	-0.3	-0.6	-0.6
	LT1	-3.7	-3.7	-3.9	-3.7	-4.1	-4.0	-4.0	-4.1	-3.9	-3.6	-3.4	-3.3	-3.3	-3.4	-3.2	-3.2	-3.4
	LT2	-2.7	-2.6	-2.5	-2.3	-1.8	-1.6	-1.4	-1.5	-1.3	-1.4	-1.2	-1.3	-1.4	-1.5	-1.2	-1.1	-1.0
	MT1	-5.1	-6.3	-5.8	-5.0	-4.6	-4.8	-4.4	-3.4	-3.1	-3.2	-3.1	-3.1	-3.1	-3.1	-3.8	-3.6	-3.9
	MT2	1.9	2.2	2.2	2.0	2.1	2.0	2.1	1.8	1.7	1.8	2.1	1.9	2.0	1.9	1.9	1.9	2.1
	MT3	3.8	3.2	2.6	2.5	2.6	2.3	2.4	2.1	2.2	2.1	2.0	2.3	2.5	2.2	2.4	2.6	2.7
	HT1	2.1	2.1	2.0	1.8	0.7	1.0	0.4	-0.2	0.0	0.1	0.1	0.3	0.4	0.4	0.7	1.1	1.3
	HT2	5.0	5.1	5.1	4.4	4.4	4.6	4.8	4.8	4.2	3.6	2.6	3.2	3.4	4.1	3.8	2.9	3.2
	MT	0.6	-0.9	-1.0	-0.5	0.2	-0.6	0.1	0.5	0.8	0.7	0.9	1.0	1.3	1.0	0.5	1.0	0.9
	HT	7.1	7.1	7.1	6.2	5.2	5.7	5.3	4.6	4.1	3.8	2.8	3.5	3.8	4.5	4.6	4.0	4.5
	MHT	7.7	6.2	6.1	5.7	5.4	5.1	5.3	5.1	5.0	4.5	3.7	4.5	5.1	5.4	5.0	5.0	5.4
	D_c	*34.8*	*33.3*	*32.2*	*30.3*	*27.8*	*28.0*	*26.0*	*24.3*	*22.6*	*22.5*	*20.8*	*20.5*	*20.4*	*20.5*	*21.0*	*20.2*	*20.3*
	P_c	*20.6*	*19.8*	*18.7*	*18.1*	*17.0*	*16.6*	*15.8*	*14.6*	*14.1*	*14.3*	*13.3*	*13.4*	*13.7*	*13.7*	*14.1*	*14.0*	*14.5*

Appendix continues

LAFAY [*J*]$_c$ indexes, dissimilarity index (D_c), and polarization index (P_c) for 16 emerging economies and G7 countries (con't)

Country		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Japan	Product group J																	
	RB1	-4.4	-4.8	-5.8	-5.9	-6.2	-5.3	-5.2	-5.5	-6.1	-5.8	-5.4	-5.3	-4.9	-4.3	-4.1	-3.8	-3.7
	RB2	-9.7	-7.9	-8.3	-7.6	-7.4	-7.8	-6.5	-5.3	-4.3	-3.8	-3.8	-3.7	-3.7	-3.3	-3.1	-3.5	-3.2
	LT1	-2.4	-2.7	-3.7	-4.5	-4.8	-4.4	-4.3	-5.0	-5.2	-5.8	-5.5	-5.8	-5.2	-5.0	-5.0	-4.9	-5.5
	LT2	1.6	0.8	0.4	0.0	-0.2	-0.3	-0.6	-0.7	-0.9	-1.1	-0.9	-0.9	-0.9	-0.7	-0.7	-0.9	-1.1
	MT1	7.9	8.0	8.5	7.8	7.7	7.4	7.2	7.5	7.1	6.3	5.4	5.6	6.4	7.1	7.1	6.8	7.8
	MT2	0.0	-0.4	-0.2	-0.3	-0.4	-0.1	-0.3	0.0	0.0	0.1	0.2	0.8	0.6	0.6	0.7	0.7	0.9
	MT3	4.6	4.1	4.7	5.1	5.6	5.4	5.2	5.1	5.7	6.4	6.8	6.8	5.9	4.9	4.9	5.3	4.7
	HT1	4.5	4.8	6.0	6.9	6.7	6.5	6.1	5.7	5.2	5.0	3.9	2.9	2.7	2.2	1.2	0.6	0.2
	HT2	-2.1	-2.1	-1.7	-1.5	-1.1	-1.5	-1.6	-1.9	-1.5	-1.3	-0.6	-0.3	-0.9	-1.5	-1.1	-0.2	-0.2
	MT	12.4	11.7	13.0	12.6	12.9	12.7	12.2	12.6	12.8	12.8	12.4	13.2	12.9	12.6	12.7	12.7	13.5
	HT	2.4	2.7	4.3	5.4	5.6	5.0	4.5	3.8	3.7	3.7	3.3	2.5	1.7	0.7	0.1	0.4	0.0
	MHT	14.8	14.5	17.3	17.9	18.5	17.7	16.7	16.4	16.5	16.6	15.6	15.7	14.7	13.3	12.9	13.1	13.5
	D_c	*37.5*	*36.1*	*39.8*	*39.9*	*40.2*	*39.7*	*37.4*	*36.7*	*35.6*	*36.2*	*34.9*	*34.7*	*33.8*	*33.8*	*32.3*	*31.5*	*33.3*
	P_c	*22.4*	*21.3*	*23.7*	*24.0*	*24.2*	*23.5*	*22.2*	*21.9*	*21.7*	*21.8*	*21.5*	*21.4*	*20.5*	*19.9*	*20.1*	*20.5*	*21.2*
Germany	Product group J																	
	RB1	-2.6	-2.8	-2.9	-2.9	-2.7	-2.6	-2.3	-2.4	-2.4	-2.4	-2.4	-2.1	-1.8	-1.6	-1.5	-1.2	-1.2
	RB2	-4.8	-3.0	-2.3	-1.8	-2.1	-1.7	-1.4	-1.2	-0.8	-0.8	-0.5	-0.9	-1.0	-1.1	-0.9	-1.4	-1.2
	LT1	-3.3	-3.7	-4.1	-3.6	-3.3	-3.3	-3.5	-3.5	-4.2	-3.8	-3.5	-3.6	-3.4	-3.0	-2.9	-2.7	-2.5
	LT2	0.7	0.2	0.2	0.0	0.1	0.1	0.0	-0.4	-0.7	-0.8	-1.0	-1.0	-0.9	-0.9	-0.9	-0.9	-0.8
	MT1	5.0	4.6	4.6	4.3	4.3	3.7	2.1	2.7	3.0	3.4	3.0	2.9	3.2	3.1	3.2	3.8	3.9
	MT2	1.7	1.6	1.6	1.4	1.1	1.3	1.7	1.6	1.7	1.8	1.7	1.7	1.8	1.5	1.5	1.5	1.3
	MT3	4.8	4.9	4.7	4.5	4.3	4.5	4.6	4.3	4.6	4.3	4.2	4.6	4.1	3.8	3.4	3.1	2.9
	HT1	-1.4	-1.3	-1.6	-1.8	-2.0	-2.0	-1.8	-1.8	-2.0	-2.2	-2.3	-2.4	-2.7	-2.6	-2.8	-3.2	-3.1
	HT2	0.0	-0.5	-0.2	0.0	0.2	0.0	0.6	0.5	0.8	0.7	0.9	0.6	0.7	1.1	1.1	0.9	0.7
	MT	11.4	11.1	10.9	10.1	9.7	9.5	8.3	8.7	9.3	9.5	8.9	9.2	9.1	8.3	8.1	8.4	8.1
	HT	-1.3	-1.9	-1.8	-1.8	-1.8	-2.0	-1.2	-1.2	-1.2	-1.6	-1.5	-1.7	-1.9	-1.6	-1.8	-2.3	-2.3
	MHT	10.1	9.2	9.1	8.3	7.9	7.6	7.1	7.5	8.1	7.9	7.4	7.5	7.1	6.7	6.3	6.1	5.7
	D_c	*21.2*	*20.5*	*19.4*	*18.3*	*18.0*	*17.9*	*16.5*	*16.7*	*18.5*	*17.9*	*16.5*	*16.4*	*16.0*	*15.7*	*15.0*	*15.0*	*14.6*
	P_c	*14.9*	*13.9*	*13.9*	*13.3*	*13.1*	*12.9*	*12.1*	*12.3*	*13.4*	*13.0*	*12.6*	*12.5*	*12.2*	*11.5*	*11.2*	*11.3*	*10.6*

Source: Elaborations on WTA data.

Appendix 4

Trade data at 3-digit classification (SITC, Rev. 2) are taken from *Statistics Canada World Trade Analyser*, 2003 release; values are expressed in current US dollars.

Data on value added, employment, industrial output, wage rates and gross capital formation at 3-digit industry classification (ISIC, Rev. 3) are taken from UNIDO, Indstat database, 2003 release. Values are at current prices and expressed in national currency units; industrial output at constant prices is expressed as index number (1991=100) Industrial output at current and constant prices are used to obtain number indexes for industrial deflators (1991=100).

PPP exchange rates are taken from Heston, Summers and Aten (2002), Penn World Tables, ver. 6.1.

GDP at current prices are taken from IMF, World Economic Outlook database (PPP exchange rates to convert them in international dollars are taken from Penn World Table).

GDP at constant prices (1996=100) expressed in PPPs are taken from Heston, Summers and Aten (2002), Penn World Tables, ver. 6.1.

Average years of schooling for population aged 15+ are taken from Bosworth and Collins (2003).