2. How Market Imperfections and Trade Barriers Shape Specialisation: *South America vs. OECD*

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ABSTRACT

In this chapter four types of market structure clusters (based on an OECD benchmark) are set out to assess different entry barriers, both endogenous and policy-induced that may affect the ability of enterprises in emerging countries to penetrate international markets. This framework is then applied to compare the trade specialisation of Argentina, Brazil and Chile (A-B-C) with that of three OECD countries, (Ireland, Korea and Mexico).

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Introduction

The pros and cons of being specialised in primary goods (agriculture, raw-materials) have been the subject of a long-lasting policy debate in South American countries, in particular Argentina, Brazil and Chile (hereafter, A-B-C). The message from traditional trade theory in this respect is rather clear. Under the assumptions of internationally perfect competition and product homogeneity, the forces of comparative advantage driving specialisation provide the best possible resource allocation. Hence there is no reason for policy makers to be concerned with the structure of specialisation.[1] However, once one moves away from this 'first-best' setting, to encompass product differentiation and imperfectly competitive markets, the outcome is less clear. A substantive literature on strategic trade policy has developed providing a rationale for policies to influence market outcomes and impact the distribution of income across countries. While this literature is not conclusive, the question policy makers are interested in is whether some patterns of specialisation are more favourable than others for the growth of the tradable sector, which is a key element of sustained economic development.

Theoretical insights on the effect of specialisation on growth fall broadly into two traditions. The first is rooted in Adam Smith's idea that specialisation increases productivity (through 'learning by doing'). The choice of the type of specialisation is, to some extent, irrelevant (Rivera-Batiz and Romer, 1991). The second follows David Ricardo in that different products offer different rates of productivity growth, and hence the choice of specialisation does matter (Grossman and Helpman, 1991). Empirical assessments have not unambiguously established the sense of the relationship between specialisation and growth. For example, Sachs and Warner (1995, 1997) concluded that economies intensively exporting natural resources in the early 1970s tended subsequently to have low rates of growth. Conversely, Dalum *et al.* (1999) find that specialisation in certain products had a relatively higher impact on growth, though this effect diminished over time. Busson and Villa (1994) suggest that greater intra-industry trade, and exports more closely matching the structure of world trade, positively affect growth. There is also an increasing body of evidence showing that it is not so much what you produce, but how you produce it that matters (World Bank, 2001). By combining the use of information and communication technologies (ICT) with human capital and knowledge, an economy can raise productivity growth even if it is specialised in traditional sectors. Policy makers should then strive to diffuse ICT and promote its use as one way to foster overall productivity growth (OECD, 2001).

Against this background, this chapter takes a somewhat different view based upon an analytical framework that shows how different market imperfections interplay with trade to shape countries' international specialisation (as measured by comparative advantages). The chapter also draws a systematic comparison between A-B-C and three OECD countries, Ireland, Korea and Mexico (hereafter IKM), which all have experienced over recent decades a significant change in their trade specialisation. The analytical framework and cross-country comparisons are intended to help guide the policy debate concerning the expansion and diversification of the tradable sector in South America.

The premise is that in the real world markets are imperfectly competitive, albeit to different degrees. This is an overarching feature of recent trade and growth theory models. In this context, the ability to generate export revenues will depend, among other things, on the type of competition and market barriers with which industries are confronted. In markets where competition is by price or quantities, low cost production can be blunted by policy-induced barriers (*e.g.* tariffs); this is typically the case for agricultural products. In markets characterised by competition through product differentiation (either quality or variety), there may be endogenous barriers related to the market power of incumbent firms.

Along these lines, the chapter starts with a discussion of the determinants of market structure. A taxonomy of four different market structure clusters is then established and applied to classify 36 manufacturing sectors for a selection of OECD countries. This establishes a benchmark that is used to assess different market barriers, both endogenous to the competition process and exogenously induced by trade policies, affecting the ability of firms to enter an international market. From this perspective, we investigate the pattern of specialisation and export performance in Argentina, Brazil and Chile, compared with those of Ireland, Korea and Mexico. The chapter finishes by drawing some conclusions for policy.

How market imperfections shape competition

Market imperfections lead firms to compete in ways other than by changing their prices. But given the many dimensions of competition in modern economies, an exhaustive classification of all types of market imperfections seems beyond reach. Nevertheless, certain similarities can be identified. Accordingly, the next section establishes a simplified taxonomy of market structures.

A taxonomy of market structure clusters

The industrial organisation literature has advanced three main explanations for the observed patterns of market structures. First, there is the traditional explanation of concentration by returns to scale. This is the basis for the original structure-conduct-performance paradigm. Market structure is mainly related to exogenous technological conditions (see survey by Panzar, 1989). While this explanation remains valid for some industries, it has become increasingly evident that many patterns of concentration cannot be explained only (or mainly) by the degree of returns to scale. Secondly, the contestable market approach developed by Baumol, Panzar and Willig (1982) enlarged the technological explanations of market structure by introducing the notion of 'economies of scope', related to the existence of multi-product firms. It also stressed the role of sunk costs, rather than economies of scale, as being a major determinant of entry barriers and hence market structure. However, empirical research suggests that the notion of contestability can only be applied to certain extreme cases of 'hit and run' entry with no sunk costs (see Stiglitz, 1987).

The third explanation, dating back to Chamberlain (1933), links market structure to product differentiation. The literature has made the distinction between two main types of product differentiation: *horizontal* and *vertical* (Eaton and Lipsey, 1989). When there is no implicit product ranking by consumers, the taste for variety is valued *per se*, so products are differentiated horizontally. In this case, Dixit and Stiglitz (1977) provided the analytical framework for monopolistic competition equilibrium with a large number of firms, horizontal differentiation and returns to scale at the firm level. Under vertical differentiation all consumers rank products in the same way, thus products can unambiguously be differentiated by quality. Gabszewicz and Thisse (1979) and Shaked and Sutton (1982, 1983) showed that vertical differentiation strategies, and hence market structures, are related to some form of endogenous sunk costs. For example, firms can increase the level of sunk costs by making strategic investments in research and development (R&D) or advertising (see Encaoua, 1989; and Beath and Katsoulacos, 1991).

These three explanations are not mutually exclusive. In real world industries, degrees of economies of scale or scope, sunk costs and product differentiation are combined. But depending on their relative importance, one aspect will tend to dominate the others, thus providing a limited number of market structure prototypes, as suggested by Sutton (1991, 1998). Along these lines, it is possible to work out a framework that reflects the main types of market structures described in the literature.

The nature of equilibrium depends on the market structure. Where products are relatively homogeneous and set-up costs are low, a large number of firms fiercely compete on prices, which are close to marginal cost. Alternatively, in the presence of high fixed costs, firms tend to be larger and have market power. But if products are still homogeneous and prices are similar, quantity competition develops, providing a strong incentive to increase concentration or to develop collusion amongst producers. Where products are differentiated horizontally, the equilibrium configuration comes close to Chamberlain's monopolistic competition. In this case product differentiation sustains demand for new products, leading to a large number of producers. Each firm has market power, but free entry of new firms counteracts the development of excess profits or monopoly rents.

The case where products are differentiated vertically is less straightforward, although some robust conclusions do emerge from the literature. An initial observation is that when products can be ranked by quality they are also ranked by prices: at a given price, consumers buy the highest available quality. Hence, when a new product enters the market at a given price and quality, the lower-quality varieties must compete by lowering their prices. At the lowest quality level, this form of competition will drive firms out of business. Trying to resist the fatal downward pressure on prices, firms respond by striving to improve quality.

There are two main channels through which firms engage in this quality race: R&D and advertising. Firms may undertake intensive R&D to generate product innovations. They may also try to improve perceptions of their product quality by advertising. But R&D or advertising can also be used as a strategic instrument to deter potential entrants with little effect on innovation or performance. In either case, incumbent firms have an incentive to increase sunk costs endogenously, creating a barrier to entry for new firms. These 'natural oligopolies' are characterised by market *segmentation*, where the number of viable firms does not increase in line with market size. In other words, there is a lower bound to concentration and over time large firms dominate the market. This contrasts with *fragmentation* that is typically found under monopolistic competition, where firms are small and industry grows through the creation of new firms rather than expansion of output in existing firms. In this case, concentration tends to decrease together with market size. A stylised presentation of these four market structures is provided in Table 2.1.

Table 2.1. **A taxonomy of market structure clusters**

	Low sunk costs	High sunk costs
Low R&D intensity	**Quasi-perfect competition** Fragmented markets with low product differentiation	**Oligopoly with low product differentiation** Segmented markets with exogenous sunk costs
High R&D intensity	**Monopolistic competition** Fragmented industries with horizontal product differentiation	**'Natural' oligopolies** Segmented markets with vertical differentiation and endogenous sunk costs

As well as summarising different types of market structure, this taxonomy will be used below to investigate the effect of policies on competition. Indeed, market power may not only reflect the characteristics of particular industries, but also policies that interfere with competition. For example, it is difficult to retain a high degree of market power in the domestic market for tradable goods without some degree of border protection: international competition would generally contest market power arising from a strong position in the domestic market.

How to classify industries into market structure clusters

The taxonomy of market structures outlined above[2] can be used to classify industries. The approach relies on two main industry indicators: the level of set-up costs, and the degree of R&D intensity. Following Sutton (1991), set-up costs in an industry can be taken as the capital costs of constructing a single plant of 'minimum efficient scale' (K_M). Given that this data is not available systematically, the assumption made is that the minimum efficient scale corresponds to the output of the median firm. Moreover, the capital-output ratio of the median firm it is assumed to be the same as for the industry as a whole:

$$\frac{K_M}{Q_M} = \frac{K}{Q} \qquad (1)$$

Where Q_M stands for the value of output of the median firm, Q for total value of industry output and K for industry capital. Using (1), the ratio of set-up costs relative to market size (*SCR*) in a given industry is:

$$SCR = \frac{K_M}{Q} = \frac{K \cdot Q_M}{Q^2} \qquad (2)$$

These set-up costs are assumed to be proportionate to sunk costs, in a way that does not vary across industries. Therefore, the *SCR* can be interpreted as indicating how high are the barriers to entry, which in turn explains tendencies towards fragmentation or segmentation observed across industries.

The second indicator used to classify industries by market structure is *R&D* intensity (*R&D* outlays/Gross output). The previous section suggested that firms could achieve product differentiation either through expenditure on *R&D* or on advertising. This paper focuses mainly on *R&D* intensity for two reasons. Firstly, data on advertising by industry and country is not sufficiently available (some evidence on advertising intensity in the United Kingdom is discussed below). More importantly, expenditure on *R&D* is believed to have spillovers for economic developments that are absent in differentiation purely based on advertising. The measure of *R&D* intensity is computed as the ratio of industry *R&D* expenditure to industry output (*R&D/Q*). Both the *SCR* and the *R&D* intensity indicators were normalised by their value across all industries. This normalisation is needed to facilitate comparison across countries (see Data Annex).

The two indicators were used to classify 36 manufacturing sectors of the OECD STAN Database into the four market structure groupings. Comparable date on size distribution of enterprise by sectors was only available for the G-5 countries that are used as a benchmark. The results are presented in Table 2.2. Industries were first ranked industries by the SCR indicator. Comparisons with qualitative information on market structures are also provided in the table. The two sources of information are remarkably coherent and hence the qualitative information was used to establish the threshold distinguishing Fragmented from Segmented structures. Following this first step, within each group, industries were ranked according to *R&D* intensity. The threshold used to split low from high *R&D* industries was the average *R&D* intensity for total manufacturing. An observable quantum leap in the value of the indicator at this point suggests that this is a reasonable approach.[3]

Table 2.2. **Market structure indicators and clusters for the G-5 countries**

OECD STAN		A Qualitative information	B Sunk Costs indicator[1]	C R&D Intensity[1]
	Low Sunk costs, low-R&D (FL)			
3220	Wearing apparel	F	2	16
3810	Metal products	F	2	35
3112	Food products	F/S	3	15
3420	Printing and publishing	F	4	17
3320	Furniture	F	5	8
3560	Plastic products	F	5	57
3210	Textiles	F	5	11
3310	Wood products	F	6	7
3690	Non-metal products	F	7	39
3410	Paper products and pulp	F	14	12
3230	Leather products	F	15	13
3240	Footwear	F	19	14
	High sunk costs , low R&D (SL)			
3130	Beverages	F/S	41	29
3720	Non-ferrous metals	S	126	54
3610	Pottery and china	F/S	133	50
3620	Glass products	S	139	43
3550	Rubber products	S	154	66
3710	Iron and steel	S	157	40
3841	Shipbuilding and repair	S	169	69
3530	Petroleum refineries	S	858	36
3140	Tobacco products	S	921	30
	Low sunk costs, high R&D (FH)			
3829	Non-electrical machinery and equipment	F	3	105
3900	Other manufacturing	F	4	111
3850	Professional goods	F	19	276
	High sunk costs, high R&D (SH)			
3839	Electrical machinery and equipment	S	32	154
3510	Industrial chemicals	S	81	131
3522	Drugs and medicines	S	88	612
3529	Chemical products	F/S	90	141
3843	Motor vehicles	S	96	136
3832	Radio, TV and communications equipment	F/S	96	589
3540	Petroleum and coal products	S	114	123
3849	Other transport equipment	F/S	164	111
3844	Motorcycles and bicycles	S	182	116
3845	Aircraft	S	192	604
3825	Office and computing machinery	F/S	390	488
3842	Railway equipment	S	512	117

1. Average indicators computed for the G-5 countries (France, Germany, Japan, United Kingdom and United States), and normalised (total manufacturing=100).
A: Based on descriptive information from the EU, *Panorama of EU industries*; F = fragmented, S = segmented, F/S = sectors with a mixture of both large firms and a significant group of small firms.
B: Estimate of minimum efficient scale multiplied by capital intensity (Sutton, 1991).
C: R&D outlays per gross output.

Sources: OECD, STAN Database, van Ark and Monnikhof (1966) and authors' calculations.

The analysis is validated by the fact that the ranking of these market structure indicators is highly correlated across countries (see Table 2.3).[4] In relative terms, the industries that face large entry costs or have a high R&D intensity in one country also display a similar relative position in other countries. In other words, the forces that drive industries to a particular market structure seem to be universal. Since this strong result is likely to be the consequence of international trade and competition, the analysis for OECD countries can reasonably offer a benchmark for other countries open to international competition.

Table 2.3. **Stability of market structure indicators across countries**
Spearman rank correlation[1]

Sunk cost indicator	France	Germany	Japan	United Kingdom	United States
France	..	..	..	..	..
Germany	0.67	..	..	..	..
Japan	0.55	0.34	..	..	..
United Kingdom	0.52	0.73	0.52	..	..
United States	0.59	0.70	0.59	0.72	..
R&D indicator					
France	..	..	..	..	..
Germany	0.87	..	..	..	..
Japan	0.86	0.78	..	..	..
United Kingdom	0.84	0.67	0.70	..	..
United States	0.87	0.79	0.74	0.81	..

1. Two-tailed critical value at 1% level = 0.432. From Newbold (1991).
Source: Authors' calculations.

All else being equal, one would expect countries with relatively smaller stocks of physical and human capital to be less able to compete in the high-R&D clusters. Likewise, countries that have access to relatively large supplies of low-skilled labour and standard technologies should be more competitive in the low-R&D clusters. Similarly, these countries should find it easier to enter into fragmented rather than segmented industries.

In addition to the endogenous entry barriers described above, there are other features of competition that affect the ability of firms to enter a market. These relate notably to the existence of production networks and large advertising expenditures incurred by firms seeking to differentiate themselves. If the degree of intra-firm trade is a proxy for the presence of international production networks, then Table 2.4 shows that these networks are concentrated in high R&D sectors. Therefore, for a firm successfully to enter the market in a high R&D cluster it has to become part of an

international production network. This can occur through joint ventures, sub-contracting and, most importantly, foreign direct investment (FDI). Advertising serves a dual purpose; it seeks both to inform consumers about product differences that arise from research and development, and to persuade consumers that what could be seen as essentially homogenous products are in fact differentiated. The food sector provides a good illustration. Hence, high advertising intensity can be found not only in high R&D sectors, but also in sectors where mainly price competition prevails (Table 2.5). In both cases, these endogenous barriers make it difficult for a firm in an emerging market to penetrate external markets.

Table 2.4. **Production networks: intensity of intra-firm trade,[1] 1998**
Percentage of total trade

SIC 3	Manufacturing industries	Share of intra-firm trade	*Memorandum item: share of Sectoral trade in total trade*
S34	Motor vehicles	76.4	*12.1*
S24_23	Drugs and medicines	69.0	*1.6*
S32	Radio, TV and communication equipment	38.8	*9.3*
S24	Chemical products	34.0	*7.9*
S30	Office, accounting and computing machinery	31.3	*7.7*
S25	Rubber and plastic products	25.0	*2.1*
S29_30	Non-electrical machinery and equipment	22.0	*17.0*
S33	Medical, precision, opt. instruments	18.6	*4.0*
S28	Fabricated metal products	17.1	*2.0*
S26	Non-metallic mineral products	16.4	*1.1*
S15_16	Food, beverages and tobacco	15.1	*3.9*
S31	Electrical machinery and apparatus n.e.c.	14.5	*4.3*
S21	Paper and products	12.8	*1.8*
S27	Basic metals	11.5	*3.8*
S20	Wood and wood products, except furniture	9.8	*1.2*
S22	Printing, publishing and recorded media	5.3	*0.8*
S10_14	Mining and quarrying	4.3	*3.5*
S35	Other transport equipment	2.6	*5.9*
S17_19	Textiles, wearing apparel, leather, footwear	2.5	*6.5*
S01_05	Agriculture, hunting and forestry, fishing	1.8	*3.0*
S23	Refined petroleum and coal products	n.a.	*1.4*
S36	Furniture, manufacturing n.e.c.	n.a.	*4.2*
S37	Recycling	n.a.	*n.a.*
S40_99	Other non manufacturing	n.a.	*0.0*
S01_99	Total Business Enterprise	40.1	*100.0*

1. Inward and outward intra-firm trade for US companies.
Source: OECD.

Table 2.5. **Advertising intensity by sector, United Kingdom, 2000**

	Intensity	Volume
Drugs and medicines	641	2.3
Chemical products nec	584	12.1
Plastic products	414	3.4
Radio, TV and communications equipment	319	6.2
Professional goods	296	1.0
Paper products and pulp	294	2.2
Printing and publishing	258	6.0
Motor vehicles	218	17.9
Furniture	188	3.0
Food products	127	15.1
Machinery and equipment nec	118	0.3
Textiles	111	1.1
Electrical machinery nec	107	1.2
Office and computing machinery	102	0.0
Motorcycles and bicycles	94	0.2
Beverages	84	11.0
Metal products	69	0.1
Footwear	53	0.7
Other manufacturing	36	0.5
Other transport equipment	29	0.3
Tobacco products	25	0.9
Wearing apparel	20	1.4
Petroleum and coal products	5	0.2

Note: Intensity = advertising/sales ratio, with 100 being the average for total manufacturing.
Volume = share of advertising expenditure in total costs (per cent).
Source: *Advertising Statistics Yearbook 2001*.

In principle, this framework can also encompass primary sectors (agriculture and raw materials), but owing to the lack of sufficiently detailed data it was not possible to compute the same indicators as for manufacturing. A qualitative judgement was followed instead. As the supply of agricultural products by and large characterised by a large number of producers offering relatively homogeneous goods, the agricultural sector was classified in the Fragmented, low-R&D cluster. This is a crude approximation, as some segments of the agricultural sector can be relatively

concentrated. Conversely, the supply of raw materials typically requires high initial investments and is carried out by a few large firms. These industries are therefore classified in the Segmented, low-R&D cluster. Given these simplifying assumptions, the investigation of trade specialisation in the following section shows results for primary products separately.

A final point concerns the availability of skilled labour. Even in the absence of barriers, countries may be unable to specialise in sectors requiring high numbers of skilled workers. Table 2.6 confirms that high-R&D sectors employ a higher proportion of skilled workers. High skills are likely to be a particular feature of the Fragmented, high-R&D cluster, since small firms depend on innovation and development for the creation of product niches to stay in the market. This requires an environment supporting and sustaining entrepreneurship, and encouraging labour training.

Table 2.6. **Intensity of skilled labour by sector, 1998**
Percentage share of skilled employees in the labour force

Office machinery, computers	53
Coke, petroleum products	38
Radio, television and communication equipment	35
Chemicals	33
Medical and optical instruments	33
Publishing, printing	29
Other transport equipment	27
Electrical machinery n.e.c.	21
Machinery and equipment n.e.c.	19
Tobacco	17
Motor vehicles	14
Basic metals	14
Rubber and plastics products	14
Other non-metallic mineral products	13
Food products and beverages	12
Pulp, paper and paper products	11
Metal products, except machinery and equipment	11
Textiles	10
Wood, except furniture	8
Wearing apparel, dyeing of fur	6
Dressing of leather, luggage	4

Note: The data is based on the OECD/DEELSA classification of employees across nine skill levels. The share of skilled workers is defined as the share top-3 skill categories in total employment. The average skilled workers for total manufacturing is 20.1.
Source: OECD.

Interaction between policy-induced barriers and market structures

In addition to endogenous entry barriers, policy-induced or exogenous barriers also shape competition in international markets. Notably, agricultural and agro-food markets are strongly distorted by the existence of high trade barriers (see Table 2.A1.3 in the Data Annex). These barriers are often higher for processed, hence more differentiated, products than for commodities.[5] During implementation of the Uruguay Round, tariff reductions on primary products have exceeded reductions on processed food products. Concerning the manufacturing sector, it is noticeable that both tariffs and non-tariff barriers (NTBs) are concentrated in the Low-R&D clusters (see Table 2.7). But they act in different ways depending on whether markets are fragmented or segmented. Tariffs are noticeably higher in the Fragmented, low-R&D markets, where competition is mainly by price.

The effect of tariffs is reinforced by the presence of pervasive NTBs that also affect the segmented cluster, dominated by large firms, where competition is typically by quantity in order to benefit from economies of scale or scope. Indeed, when goods are relatively homogeneous and prices are determined at the world level, NTBs can be very effective in protecting domestic producers. In the importing country, they reinforce domestic producers' market power by supporting the volume of production, while producers in the exporting country are in a position to benefit by exploiting their quotas or voluntary export restraints (VERs). In the specific case of anti-dumping, firms typically need to be large in order for lobbying governments to undertake actions on their behalf and products have to be comparable.

Table 2.7. **Summary of manufacturing tariffs[1] and non-tariffs[2] by market structure cluster**

	Low sunk costs (dominance of small firms)	High sunk costs (dominance of large firms)
Low R&D	Tariff: 10 Non-tariff: 38; 36; 29	Tariff: 8 Non-tariff: 28; 19; 9
High R&D	Tariff: 3 Non-tariff: 3; 4; 1	Tariff: 4 Non-tariff: 5; 4; 3

1. Average applied tariff rate 1996, weighted by import values in USD, for the EU, Japan and the United States.
2. Proportion of tariff lines subject to non-tariff barriers, weighted by number of tariff lines, for the EU, Japan and the United States; respectively for 1988, 1993 and 1996.

Source: UNCTAD and OECD.

The evolving structure of trade specialisation: a comparative approach

Measuring revealed comparative advantage

The Ricardian principle of comparative advantage is a genuinely general equilibrium concept, which holds across all types of market structure, whether markets are perfect or imperfect, distorted or not. In this paper an index of revealed comparative advantage (*RCA*) is used to explore the pattern of specialisation in Argentina, Brazil and Chile in comparison with that of Ireland, Korea and Mexico. This indicator follows Neven (1995), and is computed as the difference between a sector's share in total exports and its share in total imports, as follows:

$$RCA_i = \left(\frac{X_i}{\sum_n X_i} - \frac{M_i}{\sum_n M_i} \right) \cdot 100, \text{ and } \sum_n RCA_i = 0. \qquad (3)$$

Where X and M stand respectively for exports and imports, i for the sector of activity, and n for the number of sectors. The maximum and minimum values of the index are 100 and -100, attained in the case where there is complete trade specialisation and only two goods. In practice, for developed countries, the value of the index rarely exceeds 10. Note that the RCA is based on both exports and imports under the theoretical condition of balanced trade. In this it differs from the more usual Balassa indicator, which takes only exports into account. Looking exclusively at one side of trade flows is not desirable, given the increasing importance of intra-industry trade at the sectoral level. Indeed, it is straightforward to derive an index of intra-industry trade (IIT) from the RCAs, as follows:

$$IIT = \left(100 - \frac{1}{2} \sum_n \left| RCA_i \right| \right) \qquad (4)$$

Noteworthy is that the IIT index is equivalent to the usual Grubel-Lloyd index of intra-industry trade corrected for any aggregate trade imbalance (Aquino, 1978).

Patterns of specialisation by market structure clusters

The following analysis uses a harmonised data set for international trade, divided into 72 product categories, produced by the French institute CEPII (see the description of the data in Annex 2.A1). As an introduction to the patterns of specialisation in the A-B-C and IKM groups, Table 2.8 sets out the top-10 *RCA*s for 1970 and 2000.[6] A striking difference emerges between the two groups. In Argentina, Brazil and Chile the top *RCA*s remained concentrated in primary goods, though the value of the *RCA*s fell, indicating greater diversification of trade. The only notable exception is the iron and steel sector in Brazil.

Table 2.8. **Composition of RCAs[1] in 1970 and 2000, by country**

	Argentina	1970			2000
JA	Cereals	29.19	IB	Crude oil	10.16
KC	Meat	17.35	JA	Cereals	9.84
KD	Preserved meat/fish	7.37	KG	Animal food	9.12
KG	Animal food	6.74	KB	Fats	7.01
JC	Non-edible agricultural products	6.23	JB	Other edible agricultural products	6.32
KB	Fats	5.09	KC	Meat	4.93
JB	Other edible agricultural products	3.26	IH	Refined petroleum products	3.68
DE	Leather	1.73	IC	Natural gas	1.87
KF	Sugar	0.97	DE	Leather	1.77
KA	Cereal products	0.47	CB	Tubes	1.03
HB	Non ferrous ores	0.13	KH	Beverages	0.91
DC	Knitwear	0.01	HB	Non ferrous ores	0.80
II	Electricity	0.01	KF	Sugar	0.72
NA	Jewellery, works of art	0.01	KA	Cereal products	0.65
FP	Domestic electrical appliances	0.01	JC	Non-edible agricultural products	0.38
NB	Non-monetary gold	0.00	FU	Commercial vehicles	0.35
EB	Furniture	0.00	CA	Iron Steel	0.34
GI	Rubber articles (incl. tyres)	-0.01	KD	Preserved meat/fish	0.12
IG	Coke	-0.02	KI	Manufactured tobaccos	0.06
KI	Manufactured tobaccos	-0.05	NB	Non-monetary gold	0.03
	Brazil	1970			2000
JB	Other edible agricultural products	38.30	JB	Other edible agricultural products	8.13
JC	Non-edible agricultural products	10.95	HA	Iron ores	6.84
HA	Iron ores	9.74	CA	Iron Steel	5.24
KF	Sugar	6.08	DE	Leather	3.67
KC	Meat	3.00	KG	Animal food	3.13
KG	Animal food	2.88	EC	Paper	3.05
KE	Preserved fruits	1.68	KF	Sugar	2.89
HB	Non ferrous ores	1.59	KH	Beverages	2.44
EA	Wood articles	0.94	KC	Meat	2.29
DE	Leather	0.82	NV	N.e.s. products	1.69
NA	Jewellery, works of art	0.75	EA	Wood articles	1.12
KB	Fats	0.64	JC	Non-edible agricultural products	1.00
KH	Beverages	0.36	CC	Non ferrous metals	0.89
NV	N.e.s. products	0.09	NB	Non-monetary gold	0.69
KI	Manufactured tobaccos	0.04	KE	Preserved fruits	0.65
DD	Carpets	0.04	KD	Preserved meat/fish	0.65
EB	Furniture	0.03	EB	Furniture	0.58
DC	Knitwear	0.02	HC	Unprocessed minerals n.e.s.	0.54
FH	Arms	0.02	BB	Ceramics	0.36
NB	Non-monetary gold	0.00	DD	Carpets	0.35

Table 2.8. **Composition of RCAs[1] in 1970 and 2000, by country *(continued)***

	Chile	1970			2000
CC	Non ferrous metals	67.25	CC	Non ferrous metals	27.94
HA	Iron ores	9.72	HB	Non ferrous ores	13.94
HB	Non ferrous ores	6.37	JB	Other edible agricultural products	8.16
EC	Paper	2.02	KC	Meat	6.54
KG	Animal food	1.15	EC	Paper	4.62
HC	Unprocessed minerals n.e.s.	0.97	JC	Non-edible agricultural products	4.24
KD	Preserved meat/fish	0.47	KH	Beverages	3.34
KH	Beverages	0.12	KE	Preserved fruits	1.34
NA	Jewellery, works of art	0.01	HA	Iron ores	1.10
NB	Non-monetary gold	0.00	KD	Preserved meat/fish	1.02
II	Electricity	0.00	KG	Animal food	0.84
KI	Manufactured tobaccos	-0.01	EA	Wood articles	0.80
EB	Furniture	-0.02	NV	N.e.s. products	0.72
BA	Cement	-0.02	GA	Basic inorganic chemicals	0.70
KA	Cereal products	-0.04	NB	Non-monetary gold	0.47
DC	Knitwear	-0.04	GC	Basic organic chemicals	0.39
FH	Arms	-0.05	HC	Unprocessed minerals n.e.s.	0.28
EA	Wood articles	-0.07	ED	Printing	0.12
FP	Domestic electrical appliances	-0.12	KA	Cereal products	0.03
IG	Coke	-0.14	IG	Coke	0.00
	Mexico	1970			2000
JB	Other edible agricultural products	20.23	IB	Crude oil	9.40
KC	Meat	7.71	FT	Cars and cycles	8.83
JC	Non-edible agricultural products	7.69	FM	Consumer electronics	3.88
KF	Sugar	6.33	FO	Computer equipment	3.62
CC	Non ferrous metals	3.80	FU	Commercial vehicles	2.65
HC	Unprocessed minerals n.e.s.	3.51	FN	Telecommunications equipment	2.34
IB	Crude oil	2.41	DB	Clothing	2.18
HB	Non ferrous ores	1.65	DC	Knitwear	1.39
KE	Preserved fruits	1.56	EB	Furniture	1.37
NV	N.e.s. products	1.20	JB	Other edible agricultural products	1.02
DE	Leather	0.98	KH	Beverages	0.85
EA	Wood articles	0.84	FQ	Electrical equipment	0.79
GA	Basic inorganic chemicals	0.65	FI	Precision instruments	0.49
DA	Yarns fabrics	0.57	FP	Domestic electrical appliances	0.44
EE	Miscellaneous manuf. articles	0.53	BA	Cement	0.11
KH	Beverages	0.37	DD	Carpets	0.08
KD	Preserved meat/fish	0.33	BC	Glass	0.04
NA	Jewellery, works of art	0.29	HC	Unprocessed minerals n.e.s.	0.02
ED	Printing	0.24	GG	Plastics	0.01
EB	Furniture	0.20	NA	Jewellery, works of art	0.01

Table 2.8. **Composition of RCAs[1] in 1970 and 2000, by country *(continued)***

	Ireland	1970			2000
KC	Meat	15.53	GC	Basic organic chemicals	17.80
JB	Other edible agricultural products	7.32	FO	Computer equipment	5.88
KB	Fats	6.32	GF	Pharmaceuticals	4.10
NV	N.e.s. products	3.50	EE	Miscellaneous manuf. articles	3.87
KD	Preserved meat/fish	3.30	GE	Toiletries	2.28
HB	Non ferrous ores	3.25	KC	Meat	1.58
KF	Sugar	2.52	KE	Preserved fruits	1.18
KH	Beverages	2.00	KB	Fats	0.94
DB	Clothing	1.41	HB	Non ferrous ores	0.22
DE	Leather	1.35	FI	Precision instruments	0.12
FI	Precision instruments	1.16	KD	Preserved meat/fish	0.07
HC	Unprocessed minerals n.e.s.	1.13	HC	Unprocessed minerals n.e.s.	0.03
DC	Knitwear	0.98	GG	Plastics	0.02
DD	Carpets	0.64	IG	Coke	0.00
GF	Pharmaceuticals	0.55	II	Electricity	-0.01
FL	Electronic components	0.37	KI	Manufactured tobaccos	-0.02
GI	Rubber articles (incl. tyres)	0.29	FH	Arms	-0.02
FP	Domestic electrical appliances	0.29	NB	Non-monetary gold	-0.03
KA	Cereal products	0.28	HA	Iron ores	-0.03
BC	Glass	0.24	FJ	Clockmaking	-0.06
	Korea	**1970**			**2000**
EE	Miscellaneous manuf. articles	12.52	FT	Cars and cycles	7.52
DB	Clothing	11.59	FO	Computer equipment	6.21
DC	Knitwear	11.08	DA	Yarns fabrics	4.55
EA	Wood articles	10.97	FV	Ships	4.13
DA	Yarns fabrics	5.17	FN	Telecommunications equipment	3.66
KC	Meat	4.23	GH	Plastic articles	2.60
JB	Other edible agricultural products	2.94	FL	Electronic components	2.41
DE	Leather	2.79	IH	Refined petroleum products	2.40
HB	Non ferrous ores	2.66	FM	Consumer electronics	1.75
FL	Electronic components	1.76	DC	Knitwear	1.02
DD	Carpets	1.03	FP	Domestic electrical appliances	0.96
KD	Preserved meat/fish	0.79	DE	Leather	0.94
FM	Consumer electronics	0.49	GI	Rubber articles (incl. tyres)	0.76
BA	Cement	0.48	DD	Carpets	0.69
IA	Coals	0.46	FU	Commercial vehicles	0.66
GB	Fertilizers	0.42	DB	Clothing	0.63
KE	Preserved fruits	0.33	GG	Plastics	0.51
NA	Jewellery, works of art	0.31	FF	Construction equipment	0.48
GI	Rubber articles (incl. tyres)	0.24	FB	Miscellaneous hardware	0.45
HC	Unprocessed minerals n.e.s.	0.14	NB	Non-monetary gold	0.39

1. RCA: Revealed comparative advantage indicator ($Xi/\Sigma(Xi)-Mi/\Sigma(Mi)$).
Source: CEPII, CHELEM database.

In the IKM group, there were marked changes in the structure of revealed comparative advantages. From a structure of specialisation characterised by primary products, Ireland and Mexico have evolved towards a specialisation based on manufactured products. Within the manufacturing sector, industries such as motor vehicles, consumer electronics, computer equipment, chemicals and pharmaceuticals have emerged. Not having sizeable endowments of natural resources, Korea has been consistently specialised in the manufacturing sector. Nonetheless, there has been an important change away from labour-intensive towards capital and R&D intensive industries.

The evolution of specialisation according to market structure clusters deserves a separate consideration. For each country, Figure 2.1 first displays the *RCA* for agriculture, raw materials and manufacturing. It then decomposes the *RCA* for manufacturing into the four clusters described above. Unsurprisingly, the A-B-C group has consistently specialised in the clusters characterised by low R&D intensity, where competition in world markets is mainly defined by prices or quantities, with relatively homogenous goods, and trade barriers in OECD countries were the highest (Table 2.7). For the manufacturing sector, the highest *RCA* is concentrated in the Segmented, low-R&D cluster.

Figure 2.1. **Structure of trade specialisation by market structure clusters**[1]

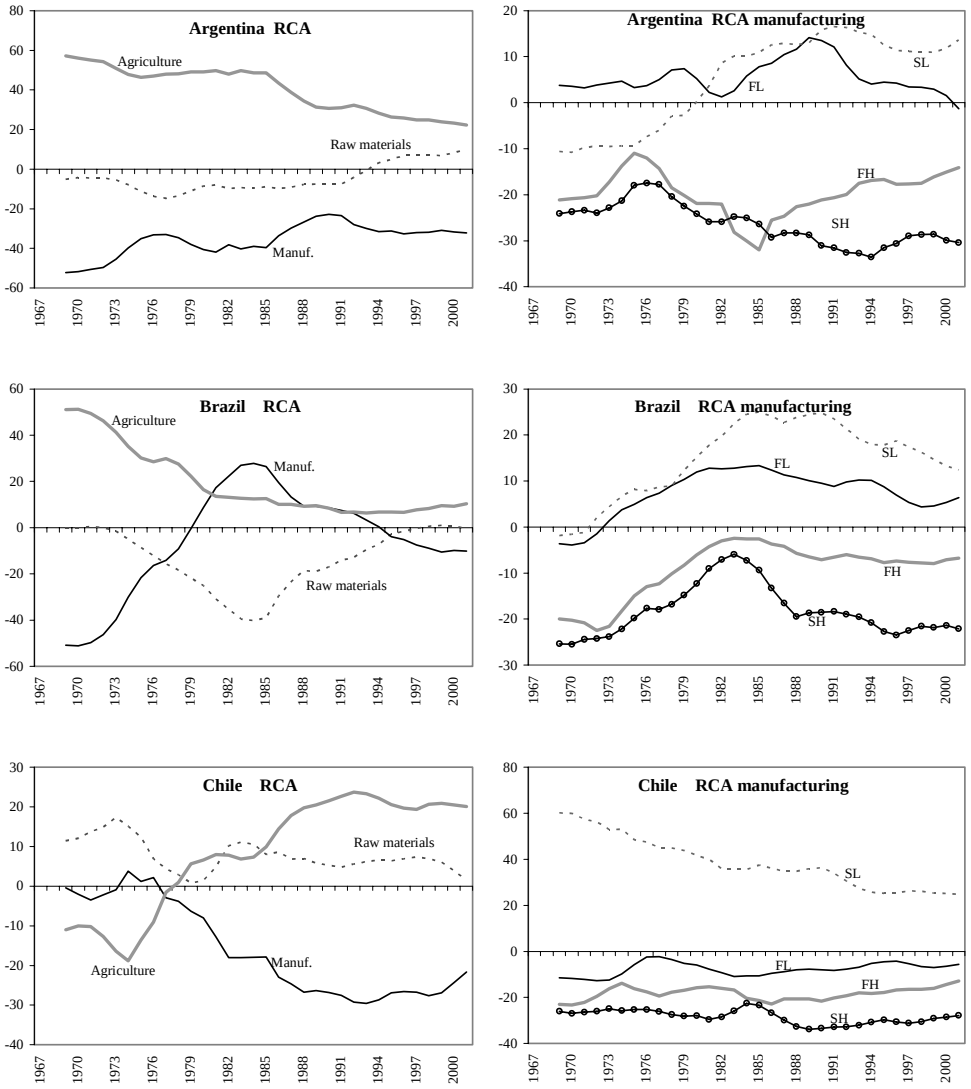
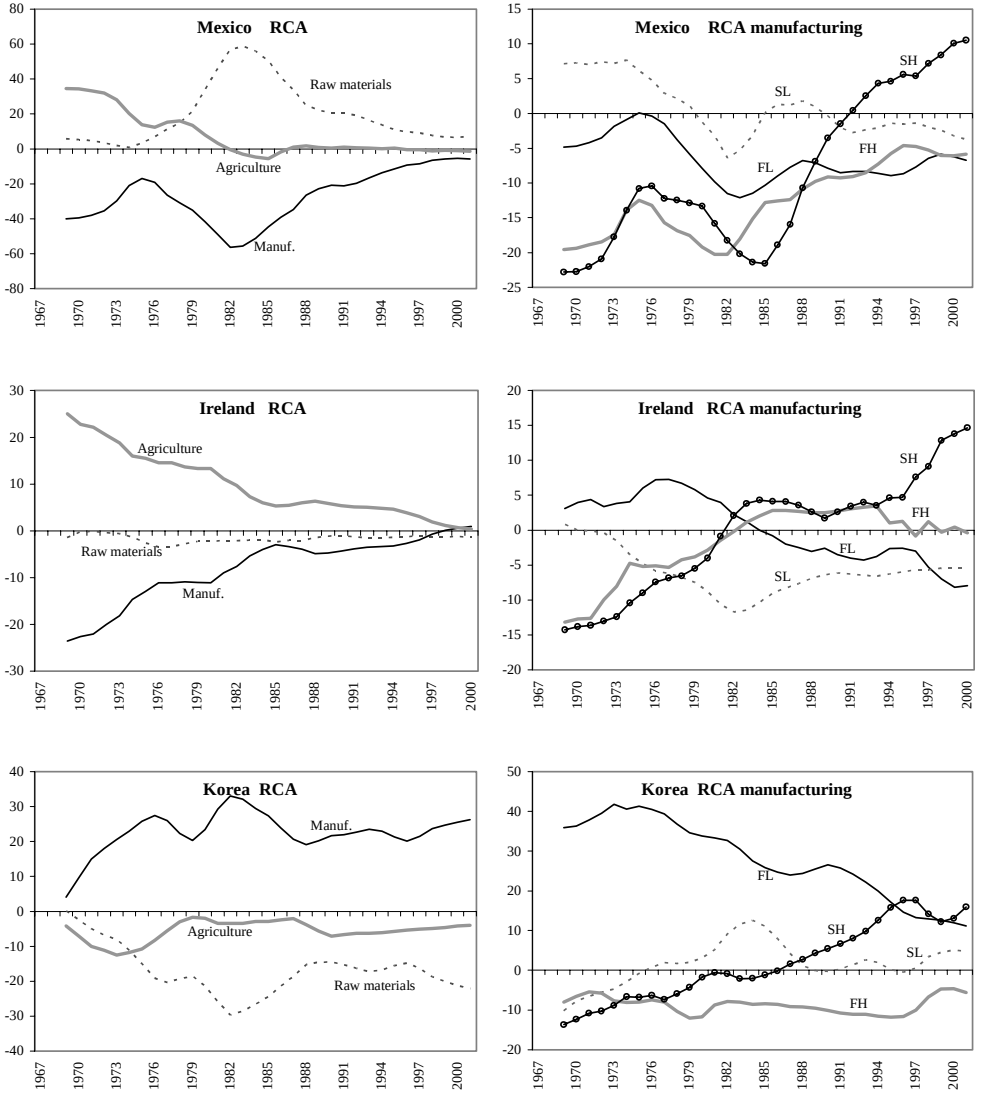


Figure 2.1. **Structure of trade specialisation by market structure clusters**[1] ***(continued)***



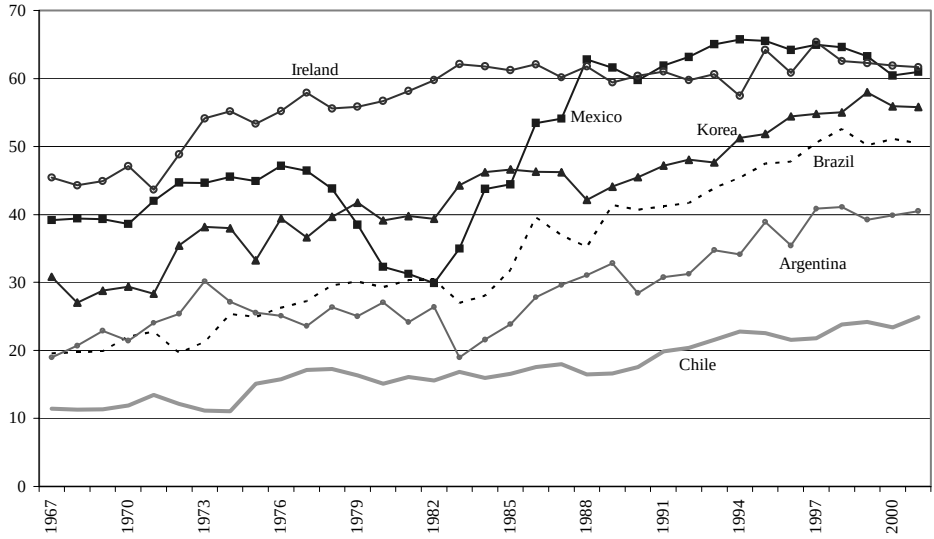
1. Revealed comparative advantage indicator (Xi/sum(Xi) -Mi/sum(Mi)).
Note: FH: Fragmented, High R&D; FL: Fragmented, Low R&D; SH: Segmented, High R&D; SL: Segmented, Low R&D.
Source: CEPII, CHELEM data base (see Data Annex).

The dynamics of specialisation in Brazil deserves to be singled out. A strong trend increase during the 1970s in the *RCA*s for the segmented, low R&D cluster was subsequently reversed. The initial increase was largely driven by state-led industrialisation in support of domestic heavy industries. But the debt crisis of 1982 severely reduced the ability of Brazil to draw on foreign capital to finance its rapid industrialisation. Earlier increases in the *RCA*s for the high-R&D clusters were also reversed. Following the trade liberalisation policies of the early 1990s, the forces of comparative advantage being at work, the structure of trade in Brazil had reverted to specialisation in primary products by the end of the decade.

In IKM an opposite development took place. The R&D-intensive clusters, particularly the industries dominated by large firms, replaced traditional specialisation. This allowed IKM to evolve towards patterns of specialisation closer to those in more advanced OECD countries.

Finally, these specialisation patterns need to be seen against the background of growing intra-industry trade, as measured by means of the *IIT* indicator (Figure 2.2). Intra-industry trade has lessened dependence on homogenous products, with one-way trade that was typical at the beginning of the period under review. Such developments occurred in all six countries, but in the IKM group the intensity of intra-industry trade has consistently been much higher than in A-B-C. Chile shows the lowest intensity of intra-industry trade, being exceptionally dependent on a single homogenous good (copper).

Figure 2.2. **Evolution of intra-industry trade by country**



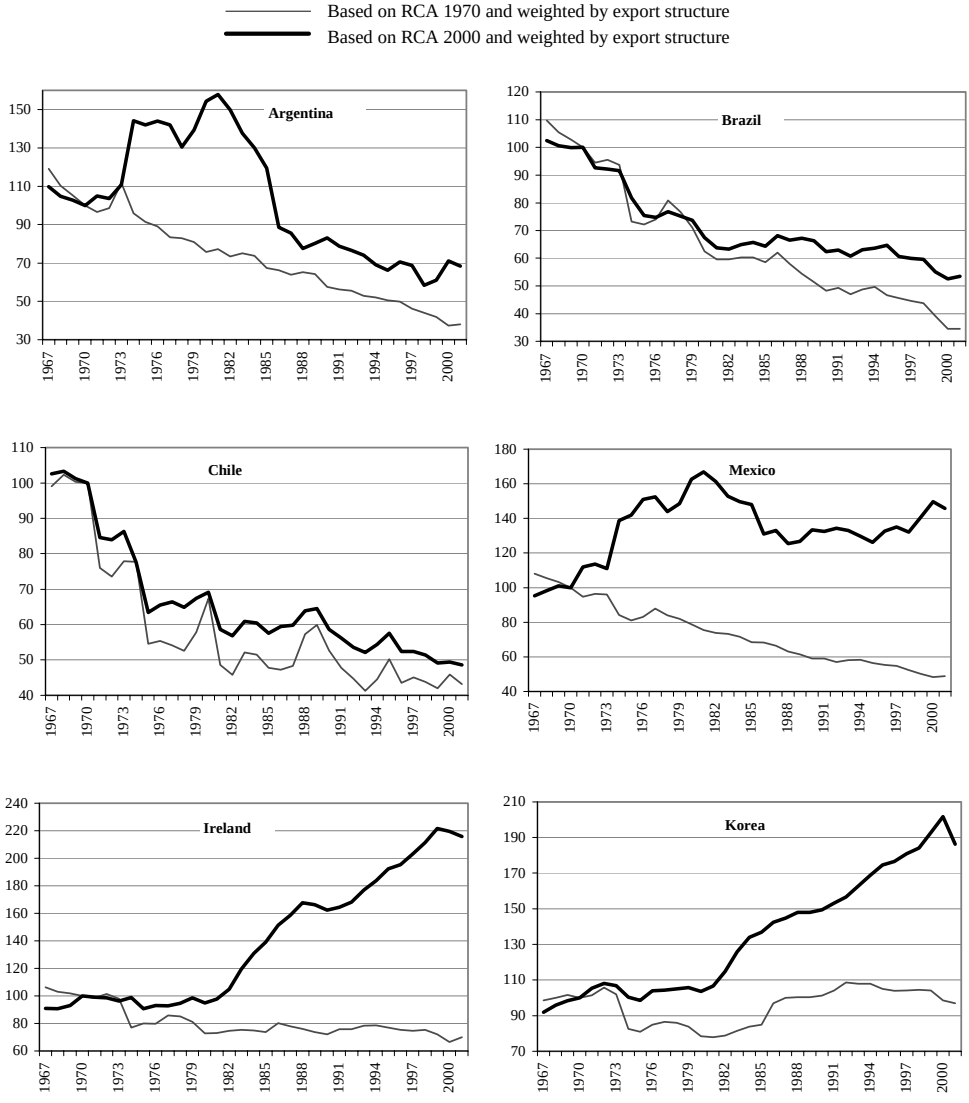
Source: CEPII, CHELEM database.

Adaptation to international demand and export performance

Generating export revenues depends on both the dynamics of demand and the ability of a country to gain market shares in world trade. To evaluate the adaptation of a country's export structure to international demand, the share in world trade of those goods corresponding to the top–20 *RCA*s for each country in 1970 and 2001 (Figure 2.3) was computed. An increased share shows that a given product basket better matches evolving international demand.

Figure 2.3. **Evolution of world export markets based on country RCAs**[1]

1970=100



1. RCA: Revealed comparative advantage indicator (Xi/Sum(Xi)-Mi/Sum(Mi)).

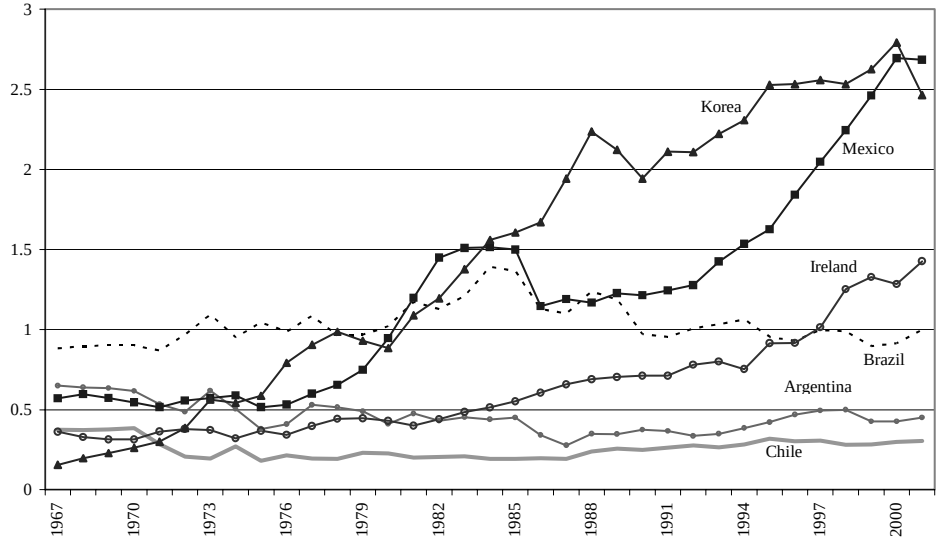
Note: Average share in world trade of products corresponding to the top-20 comparative advantages in 1970 and 2000 for each country. This average was weighted by the structure of exports of each country , for the 2 chosen years.

Source: CEPII, CHELEM database.

There is again a revealing contrast between the A-B-C and the IKM groups. For Argentina, Brazil and Chile, both the *RCA* baskets in 1970 and in 2000 show a declining trend. This means that the products corresponding to the main revealed comparative advantages of A-B-C are losing importance in terms of world trade. In Ireland, Korea and Mexico, the same pattern applies for the *RCA* baskets of 1970, but the 2000 *RCA* baskets follow a different path. For Ireland and Korea, they display a rising share in world trade. For Mexico, the 2001 *RCA* basket increased its share in world trade and then stabilised. These trends imply, *ceteris paribus*, that changing trade specialisation in IKM has provided more opportunities to generate export revenues compared to the situation characterised by their comparative advantages in the early 1970s.

In order to verify this point, Figure 2.4 displays the exports shares of each country in world trade. From 1970 to 2001, market shares for A-B-C stagnated whereas those of IKM have increased significantly. Within the A-B-C group, Chile has actually been rather successful in increasing its market share for agricultural goods.[7] However, this was not sufficient to compensate for the effects of the overall decline of this type of product in world trade.

Figure 2.4. **Export performance**
In percentage of world exports



Source: CEPII, CHELEM database.

Summary and insights for policy

The evolution of specialisation across industries interacts with the nature of competition. A taxonomy developed in this chapter allows us to aggregate sectors by different types of competition coherent with their microeconomic fundamentals. This taxonomy singles out a number of barriers that are either endogenous to the competition process or that result from trade policies. The existence of these barriers can make it difficult for firms to enter international markets.

When comparing the specialisation and market performance of Argentina, Brazil and Chile, with that of Ireland, Korea and Mexico, a striking contrast emerges. Apart from an increased share of intra-industry trade during the last decades, there was no significant change in specialisation within the A-B-C group, whereas in IKM the migration towards more differentiated products, *R&D*-intensive products, was noticeable.

Market integration effects, through joint trade and investment flows, are key in explaining IKM's evolution. Mexico's evolving specialisation is clearly related to the creation of NAFTA and associated market integration within North America. Ireland also fully benefited from the large European market. Korea has been for a long time exposed to competition in international markets and foreign investments.

In this regard, an important observation is that there is a mutually reinforcing effect between trade and capital flows through increased intra-industry trade (the so-called Complementarity Theorem). Noticeably, the production of highly differentiated products by large firms tends to be strongly integrated in production networks and global supply chains, which make them more responsive to demand and facilitate market access. It is difficult for an individual producer to penetrate these networked industries. This is often only possible through foreign investments or other forms of partnership. In innovative markets dominated by smaller firms, the conditions for entrepreneurial development, labour training and agglomeration effects are important determinants of competitiveness.

Market structures matter for economic development. World exports of highly differentiated products have grown faster than traditional exports. In addition, industries with high product differentiation typically have strong externalities in terms of external returns to scale, technological diffusion and labour skills (Sutton, 2001). In emerging markets, specialisation in homogeneous product industries can generate high growth rates but these gains decelerate as industries converge to the international production frontier. For products characterised by strong product or process innovation,

or external economies, the production frontier is pushed continuously outward. A-B-C have not benefited from the spillovers of market integration, while being penalised by the pervasive trade barriers against products in which they naturally have strong comparative advantages.

This conclusion requires, however, some *caveats*. Firstly, under strong regional integration, business cycles in the leading countries are transmitted rather quickly, and in some cases amplified, to the periphery (as often the peripheral country has the role of residual producer). In some sense, volatility from reliance on a single product could be replaced by fluctuations in the main partner country, as illustrated by the recent experience of Mexico. This suggests that *regional* integration, in order to benefit from network externalities in production and access to markets, and *multilateral* integration, to dampen the effects of shocks from specific countries, are both needed.

Secondly, the fact that emerging markets are exporting high-technology products needs to be gauged against their domestic *R&D* intensity. Indeed, the well-known phenomenon of Mexican *maquilladoras* illustrates how domestic enterprises can export a rather low value-added content embodied in high value-added products. In this case, the location of a given high-tech industry can remain very sensitive to pure price competition. The relatively low intensity of *R&D* in Mexico compared with those of Ireland and Korea (Table 2.9) thus raises some questions concerning the sustainability of the observed change in the structure of Mexican specialisation.

Finally, the above discussion should not overshadow the need for structural reforms, investing over the long run in education, and formulating policies to encourage entrepreneurship. Inevitably, these policies take time to materialise and will only progressively influence patterns of trade. In the meantime, lower barriers to trade and greater market integration seem to be the best way forward.

Table 2.9. **R&D Intensity for selected industries and country**

	1995	1997	1999	2000
Mexico				
Grand Total	0.04	0.04	0.07	..
Agriculture, hunting, forestry and fishing	0.00	0.00	0.00	..
Mining and quarrying	0.03	0.12	0.31	..
Total Manufacturing	0.07	0.07	0.15	..
Chemicals and chemical products	0.23	0.48	0.24	..
Chemicals excluding pharmaceuticals	0.24	0.57	0.22	..
Pharmaceuticals	0.21	0.21	0.28	..
Machinery and equipment	0.15	0.04	0.16	..
Office, Accounting and computing machinery	0.41	0.00	0.06	..
Electrical machinery and apparatus, NEC	0.19	0.07	0.15	..
Radio, television and communication equipment	0.00	0.00	0.02	..
Medical, precision and optical instruments	..	..	..	..
Motor vehicles, trailers and semi-trailers	0.05	0.03	0.12	..
Other transport equipment	..	0.00	0.02	..
Aircraft and spacecraft	..	..	..	..
Korea				
Grand Total	0.83	0.87	0.76	0.83
Agriculture, hunting, forestry and fishing	0.05	0.04	0.05	0.06
Mining and quarrying	0.26	0.15	0.23	0.26
Total Manufacturing	1.48	1.60	1.31	1.43
Chemicals and chemical products	1.51	1.40	1.09	1.06
Chemicals excluding pharmaceuticals	1.64	1.52	0.95	1.07
Pharmaceuticals	1.10	1.08	1.55	1.06
Machinery and equipment	4.82	5.52	4.26	4.31
Office, Accounting and computing machinery	2.17	1.28	2.02	2.06
Electrical machinery and apparatus, NEC	1.22	1.14	2.03	1.62
Radio, television and communication equipment	4.52	5.72	4.87	4.67
Medical, precision and optical instruments	1.20	1.57	0.97	1.69
Motor vehicles, trailers and semi-trailers	3.85	4.62	2.28	2.63
Other transport equipment	1.96	1.67	0.46	1.62
Aircraft and spacecraft	18.64	11.22	..	..
Ireland				
Grand Total	..	..	..	..
Agriculture, hunting, forestry and fishing	..	..	..	..
Mining and quarrying	0.00	..	..	..
Total Manufacturing	0.99	0.96	0.79	..
Chemicals and chemical products	1.39	0.91	0.57	..
Chemicals excluding pharmaceuticals	0.38	0.23	0.16	..
Pharmaceuticals	4.59	3.74	2.12	..
Machinery and equipment	1.66	1.86	1.55	..
Office, Accounting and computing machinery	0.33	0.35	0.28	..
Electrical machinery and apparatus, NEC	1.77	1.83	2.10	..
Radio, television and communication equipment	7.69	6.15	4.61	..
Medical, precision and optical instruments	1.90	1.70	1.61	..
Motor vehicles, trailers and semi-trailers	1.94	2.54	1.93	..
Other transport equipment	1.06	0.87	0.65	..
Aircraft and spacecraft	..	..	..	..

Source: OECD, STAN database.

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Annex 2.A1. **Data Annex**

The data on trade flows are drawn from the CHELEM database produced by the French institute CEPII. A mapping of the industrial sectors found in CHELEM onto the market structure clusters found in Table 2.1 is given in Table 2.A1.1. A rough classification of agricultural and raw materials sectors into market structure clusters is given in Table 2.A1.2.

Table 2.A1.1. **Market structure clusters and trade barriers for manufacturing**

	Fragmented	Tariff[1]	NTB[2]	Segmented	Tariff[1]	NTB[2]
Low R&D						
	CB Tubes (3810)	4.9	21.6	BA Cement (3690)	1.9	2.1
	DA Yarns, fabrics (3210)	8.7	70.8	BB Ceramics (3610)	5.3	2.5
	DB Clothing (3220)	12.8	52.0	BC Glass (3620)	6.1	1.5
	DC Knitwear (3220)	13.8	42.3	CA Iron and steel (3710)	3.5	8.6
	DD Carpets (3210)	9.1	55.2	CC Non ferrous metals (3720)	3.3	6.7
	DE Leather (3230)	10.3	9.2	FV Ships (3841)	1.3	0.0
	EA Wood articles (3310)	4.9	0.0	GI Rubber articles (incl. tyres) (3550)	3.8	14.9
	EB Furniture (3320)	2.6	0.7	IH Refined petroleum products (3530)	3.7	0.0
	EC Paper (3410)	4.2	0.4			
	ED Printing (3420)	1.3	1.1	KA Cereal products (311/312)	23.5	7.2
	FA Metallic structures (3810)	3.8	0.0	KF Sugar and chocolate (311/312)	25.4	9.1
	FB Miscellaneous hardware (3810)	4.0	5.0	KI Manufactured tobaccos (3140)	49.5	0.0
	GG Plastics (3560)	2.9	3.8	KG Animal food (311/312)	21.4	4.4
	GH Plastic articles (3560)	7.7	2.1	KH Beverages (3130)	16.3	23.9
	KB Fats (milk and dairy products) (311/312)	48.5	2.8			
	KD Preserved meat/fish (311/312)	17.3	15.5			
	KE Preserved fruits (311/312)	17.1	12.9			

Table 2.A1.1. **Market structure clusters and trade barriers for manufacturing *(continued)***

	Fragmented	Tariff[1]	NTB[2]	Segmented	Tariff[1]	NTB[2]
High R&D	EE Misc. manuf. articles (3900)	2.6	0.7	FL Electronic components (3839)	2.7	6.9
	FC Motors, engines, pumps etc. (3829)	2.6	0.3	FM Consumer electronics (3832)	6.9	30.0
	FD Agricultural machinery and equipment (3829)	2.0	2.8	FN Telecommunications equipment (3832)	4.0	13.0
	FE Machine tools (3829)	3.0	0.9	FO Computer equipment (3825)	1.5	0.0
	FF Construction machinery and equipment (3829)	2.0	2.1	FP Domestic electrical appliances (3839)	3.1	1.9
	FG Specialised machines (3829)	2.2	0.7	FQ Electrical equipment (3839)	2.7	5.8
	FH Arms (3829)	3.7	0.0	FR Electrical apparatus (3839)	3.7	2.2
	FI Precision instruments (3850)	2.6	1.1	FS Vehicles components (3849)	3.9	9.6
	FJ Clock-making (3850)	4.1	0.6	FT Cars and cycles (3844)	6.8	0.0
	FK Optics (3850)	4.1	0.0	FU Commercial vehicles (3843)	13.7	1.2
	NA Jewelry, works of art (3900)	3.0	0.0	FW Aeronautics (3845)	1.6	0.0
	NB Non-monetary gold (3900)	0.8	0.0	GA Basic inorganic chemicals (3510)	3.9	3.1
	NV N.e.s. products (3900)			GB Fertilizers (3510)	4.6	4.2
				GC Basic organic chemicals (3510)	6.7	1.1
				GD Paints (3529)	6.0	0.2
				GE Toiletries (3529)	4.6	0.7
				GF Pharmaceuticals (3522)	0.1	1.8

N.B. The product breakdown corresponds to the CHELEM database; numbers in parenthesis correspond to the ISIC rev2 categories.
1. Applied tariff rate, weighted by import values in USD, for the EU, Japan and United States in 1996.
2. Frequency of action under non-tariff barriers, weighted by number of tariff lines, in 1996.
Source: UNCTAD and OECD.

Table 2.A1.2. **Market structure clusters and trade barriers for agriculture and raw materials**

	Fragmented	Tariff[1]	NTB[2]	Segmented	Tariff[1]	NTB[2]
Low R&D	JA Cereals	58.93	11.86	HA Iron ores	0.00	0.00
	JB Other edible agricultural products	10.75	6.48	HB Non ferrous ores	0.36	1.48
	JC Non-edible agricultural products	2.11	2.14	HC Unprocessed minerals n.e.s.	0.43	1.86
	KC Meat and fish	27.16	14.57	IA Coals	0.00	8.57
				IB Crude oil	0.18	0.00
				IC Natural gas	0.53	0.00
				IG Coke	0.10	0.00
				II Electricity	0.00	0.00
High R&D						

N.B. The product breakdown corresponds to the CHELEM database.
1. Applied tariff rate, weighted by import values in USD, for the EU, Japan and United States in 1996.
2. Frequency of action under non-tariff barriers, weighted by number of tariff lines, in 1996.
Source: UNCTAD and OECD.

Table 2.A1.3. **Tariffs and non-tariffs by market structure cluster[5]**

	Total	Agriculture	Raw materials	Manufacturing	FH	FL	SH	SL
Tariff 1996								
Weighted applied tariff[1]	6.15	16.08	0.24	5.87	2.60	9.74	4.31	8.32
Average applied tariff[2]	5.52	7.44	0.36	5.48	2.41	8.00	3.90	6.05
Applied tariff dispersion[3]	9.18	18.89	1.07	7.53	2.43	7.62	4.98	12.14
Weighted bound tariff[1]	4.64	11.86	0.19	4.46	1.67	7.32	3.57	5.77
Average bound tariff[2]	4.01	5.55	0.21	3.97	1.62	5.97	3.01	3.79
Bound tariff dispersion[3]	7.08	14.04	0.75	5.95	2.14	6.30	4.11	9.00
NTB[4]								
1988	21.38	17.39	1.75	22.32	3.21	37.77	5.21	27.77
1993	18.94	14.22	1.75	19.92	3.48	35.53	4.31	18.92
1996	13.86	7.69	1.75	14.88	0.76	29.31	3.41	8.81

N.B. See Table 2.1 and 2.A1.1 for a definition of market structure clusters.
1. Tariff rate, weighted by USD import values, for the EU, Japan and United States.
2. Simple average tariff rate for the EU, Japan and United States.
3. Standard deviation of tariff rates.
4. Frequency of action under non-tariff barriers, weighted by number of tariff lines.
5. FH: Fragmented, high R&D; FL: fragmented, low R&D; SH: segmented, high R&D; SL: segmented, low R&D.
Source: UNCTAD and OECD.

Table 2.A1.4. **Structure of specialisation over time: Argentina**

		RCA[1]					Export share				RCA[1]					Import share	
Code	Title	1970	1980	1990	1995	2001		Cumu-lative	Code	Title	1970	1980	1990	1995	2001		cumu-lative
KG	Animal food	6.7	5.7	9.7	7.1	9.9	10.1	10.1	FN	Telecommunications equipment	-2.4	-3.6	-2.0	-4.3	-4.4	4.5	4.5
JA	Cereals	29.2	21.0	9.2	7.3	9.8	9.9	19.9	GC	Basic organic chemicals	-3.9	-1.1	-7.6	-2.9	-4.3	5.8	10.2
JB	Other edible agricultural prod.	3.3	12.4	11.1	8.5	8.6	10.1	30.0	FC	Engines	-4.5	-4.7	-6.5	-4.0	-4.0	5.5	15.7
IB	Crude oil	-1.4	-4.6	1.0	7.4	8.6	9.8	39.8	FS	Vehicles components	-3.5	-2.0	-2.5	-1.8	-4.0	5.4	21.1
KB	Fats	5.1	6.1	8.3	10.0	5.6	5.9	45.7	FO	Computer equipment	-1.0	-1.5	-2.6	-3.0	-3.6	3.6	24.7
IH	Refined petroleum products	-1.1	2.3	4.0	-0.1	4.2	5.5	51.3	FR	Electrical apparatus	-2.8	-2.2	-2.6	-3.5	-2.7	3.5	28.1
KC	Meat	17.3	10.2	8.3	7.0	3.7	4.4	55.7	FB	Miscellaneous hardware	-2.7	-1.9	-1.6	-2.4	-2.7	3.5	31.6
IC	Natural gas	-0.4	-2.7	-4.3	-0.1	2.6	2.6	58.3	FG	Specialised machines	-5.0	-4.2	-4.1	-3.9	-2.7	3.0	34.6
DE	Leather	1.7	4.8	4.9	3.9	1.6	3.0	61.3	GF	Pharmaceuticals	-0.9	-0.6	-2.4	-1.3	-2.6	3.9	38.5
CB	Tubes	-0.4	-0.6	1.7	1.0	1.0	1.8	63.1	GH	Plastic articles	-1.1	-2.6	-2.3	-3.0	-2.5	4.8	43.4
KH	Beverages	-0.2	0.2	1.2	1.1	0.9	1.2	64.3	EC	Paper	-4.5	-2.2	-0.1	-2.5	-2.4	3.5	46.8
HB	Non ferrous ores	0.1	0.2	-0.2	-0.2	0.6	1.2	65.4	EE	Miscellaneous manuf. articles	-1.3	-2.0	-1.9	-2.1	-2.1	2.5	49.3
FU	Commercial vehicles	-1.8	-2.0	0.1	0.1	0.6	2.4	67.8	FI	Precision instruments	-1.8	-1.9	-2.2	-2.0	-1.7	2.1	51.4
KA	Cereal products	0.5	0.2	3.1	2.5	0.5	0.7	68.5	FF	Construction equipment	-3.1	-3.1	-1.7	-2.3	-1.4	1.6	53.0
JC	Non-edible agricultural prod.	6.2	4.1	2.8	2.6	0.4	1.2	69.8	DA	Yarns fabrics	-1.2	-1.0	-0.2	-0.4	-1.3	2.1	55.0
KF	Sugar	1.0	2.8	0.8	0.2	0.4	1.0	70.8	FP	Domestic electrical appliances	0.0	-0.5	-0.3	-0.9	-1.2	1.2	56.3
EB	Furniture	0.0	-0.1	0.1	-0.3	0.2	0.9	71.7	GB	Fertilizers	-0.5	-0.6	-1.5	-1.8	-1.1	1.7	58.0
CA	Iron and Steel	-11.0	-2.4	1.2	-0.3	0.1	1.6	73.3	FM	Consumer electronics	-0.3	-3.2	-1.8	-0.9	-1.1	1.1	59.1
NV	N.e.s. products	-0.3	-2.3	-3.7	-1.3	0.1	1.7	75.0	GE	Toiletries	-0.7	-0.1	-1.2	-0.7	-1.0	2.2	61.3
NB	Non-monetary gold	0.0	0.0	0.0	0.6	0.0	0.1	75.0	GD	Paints	-0.5	-0.3	-1.8	-0.7	-1.0	1.6	62.9

1. RCA: Revealed comparative advantage indicator (Xi/Sum(Xi)-Mi/Sum(Mi)).
Source: CEPII, CHELEM database and OECD.

Table 2.A1.5. Structure of specialisation over time: Brazil

		RCA[1]					Export share				RCA[1]					Import share	
Code	Title	1970	1980	1990	1995	2001		Cumu-lative	Code	Title	1970	1980	1990	1995	2001		Cumu-lative
JB	Other edible agricultural prod	38.3	17.3	8.4	7.0	8.6	9.7	9.7	IB	Crude oil	-8.4	-38.8	-20.0	-4.9	-4.4	5.8	5.8
HA	Iron ores	9.7	9.5	9.1	7.2	6.4	6.4	16.0	FO	Computer equipment	-1.6	0.0	-1.4	-2.6	-3.0	3.5	9.3
CA	Iron and Steel	-0.8	2.2	9.4	8.0	4.0	4.8	20.8	FR	Electrical apparatus	-2.8	-1.0	-1.4	-1.1	-3.0	4.2	13.4
KF	Sugar	6.1	8.6	2.4	3.6	4.0	4.1	25.0	FG	Specialised machines	-6.0	-1.2	-4.2	-4.4	-2.9	3.6	17.0
KG	Animal food	2.9	7.1	6.0	4.5	3.8	4.0	29.0	GC	Basic organic chemicals	-3.9	-1.9	-3.6	-2.7	-2.8	4.7	21.7
DE	Leather	0.8	2.7	4.6	3.7	3.7	4.3	33.2	FN	Telecommunications equipment	-2.1	-0.8	-2.3	-3.2	-2.7	5.0	26.7
KC	Meat	3.0	1.4	0.4	1.5	3.4	3.7	37.0	IH	Refined petroleum products	-2.0	-0.3	0.8	-3.5	-2.5	4.8	31.5
EC	Paper	-1.6	1.8	2.1	3.2	2.5	3.8	40.8	GF	Pharmaceuticals	-1.0	-0.5	-1.4	-1.3	-2.4	2.9	34.5
NV	N.e.s. products	0.1	1.3	0.4	0.3	1.8	3.1	43.9	GB	Fertilizers	-2.5	-2.9	-1.5	-1.0	-2.3	2.6	37.1
KH	Beverages	0.4	1.7	4.2	2.0	1.8	2.0	45.9	FI	Precision instruments	-2.2	-1.1	-2.3	-1.7	-2.2	2.7	39.7
JC	Non-edible agricultural prod.	11.0	1.8	0.1	0.6	1.6	2.2	48.2	GH	Plastic articles	-1.8	-0.5	-0.1	-1.4	-1.9	3.4	43.1
EA	Wood articles	0.9	0.7	0.8	1.2	1.2	1.3	49.4	FW	Aeronautics	-4.5	-2.4	-4.4	-1.7	-1.9	6.4	49.5
KD	Preserved meat/fish	-0.2	0.8	0.3	0.3	1.0	1.2	50.6	FL	Electronic components	-0.3	-0.4	-1.3	-1.4	-1.9	2.1	51.6
EB	Furniture	0.0	0.1	0.1	0.5	0.6	0.9	51.5	IC	Natural gas	-0.5	-0.1	-1.0	-0.7	-1.5	1.5	53.1
KE	Preserved fruits	1.7	2.1	0.5	0.4	0.6	1.0	52.5	JA	Cereals	-1.7	-5.6	-1.6	-1.8	-1.3	2.1	55.2
HC	Unprocessed minerals n.e.s.	-0.5	-0.3	0.2	0.4	0.6	0.8	53.3	FQ	Electrical equipment	-0.8	-0.7	-0.2	0.1	-1.3	2.0	57.2
FT	Cars and cycles	-0.2	1.2	0.6	-6.5	0.5	3.6	56.9	FC	Engines	-3.5	-1.1	0.9	0.9	-1.2	4.6	61.8
NB	Non-monetary gold	0.0	0.0	0.0	0.5	0.4	0.5	57.4	FF	Construction equipment	-2.9	-0.3	0.0	-0.2	-1.0	1.8	63.6
DD	Carpets	0.0	0.5	0.5	0.3	0.3	0.5	57.9	FE	Machine tools	-1.8	-1.2	-1.3	-1.4	-1.0	1.3	64.8
CC	Non ferrous metals	-4.9	-3.0	1.8	3.4	0.3	2.2	60.1	IA	Coals	-1.1	-1.2	-2.4	-1.1	-1.0	1.0	65.8

1. RCA: Revealed comparative advantage indicator (Xi/Sum(Xi)-Mi/Sum(Mi)).
Source: CEPII, CHELEM database and OECD.

Table 2.A1.6. **Structure of the Chilean specialisation**

		RCA[1]						Export share				RCA[1]						Import share	
Code	Title	1970	1980	1990	1995	2000	2001		Cumu-lative	Code	Title	1970	1980	1990	1995	2000	2001		Cumu-lative
CC	Non ferrous metals	67.25	42.57	35.11	26.09	27.94	24.60	25.4	25.4	IB	Crude oil	-2.80	-14.03	-6.78	-6.46	-11.39	-10.75	10.8	10.8
HB	Non ferrous ores	6.37	13.46	9.12	13.83	13.94	11.87	12.1	37.5	FW	Aeronautics	-1.96	-1.55	-3.42	-2.15	-3.75	-5.25	5.5	16.3
JB	Other edible agricultural prod.	-3.12	5.63	13.78	9.34	8.16	9.82	10.5	48.0	FT	Cars and cycles	-1.71	-6.45	-4.04	-6.66	-4.49	-3.50	3.8	20.1
KC	Meat	-0.76	1.25	4.59	4.68	6.54	7.27	8.4	56.4	GH	Plastic articles	-1.49	-1.25	-3.20	-3.48	-3.23	-3.39	4.2	24.4
JC	Non-edible agricultural prod.	-1.44	5.92	6.08	5.84	4.24	4.80	5.3	61.7	FG	Specialised machines	-6.59	-3.05	-5.29	-3.88	-2.71	-3.16	3.3	27.6
EC	Paper	2.02	4.73	3.00	5.78	4.62	4.20	6.6	68.3	FU	Commercial vehicles	-5.44	-5.87	-4.07	-6.15	-3.88	-3.01	3.4	31.0
KH	Beverages	0.12	0.09	0.54	1.43	3.34	3.71	4.0	72.3	FN	Telecommunications equipment	-2.20	-1.49	-2.86	-1.98	-3.54	-3.01	3.1	34.1
KE	Preserved fruits	-0.30	-0.32	0.84	2.21	1.34	1.48	2.0	74.3	FC	Engines	-5.29	-2.70	-6.06	-2.57	-2.32	-2.79	3.0	37.1
NV	N.e.s. products	-0.82	-0.27	-0.10	-0.71	0.72	1.15	2.8	77.1	FO	Computer equipment	-1.19	-1.30	-1.68	-2.20	-3.17	-2.75	2.8	39.9
EA	Wood articles	-0.07	0.06	0.19	0.43	0.80	1.13	1.6	78.7	FF	Construction equipment	-4.06	-2.95	-5.12	-3.86	-2.73	-2.59	2.7	42.6
KD	Preserved meat/fish	0.47	0.46	1.26	0.82	1.02	1.08	1.2	79.9	IC	Natural gas	-0.18	0.05	-0.21	-0.37	-2.05	-2.58	2.8	45.5
HA	Iron ores	9.72	5.17	2.25	1.18	1.10	1.02	1.0	80.9	FB	Miscellaneous hardware	-3.04	-1.99	-3.53	-2.49	-2.08	-2.26	2.9	48.4
GA	Basic inorganic chemicals	-0.60	0.01	-0.03	0.32	0.70	0.75	1.9	82.8	FR	Electrical apparatus	-3.32	-1.75	-3.04	-2.23	-2.04	-2.15	2.4	50.8
HC	Unprocessed minerals n.e.s.	0.97	0.91	0.42	0.30	0.28	0.58	0.8	83.6	EE	Miscellaneous manuf. articles	-0.86	-1.84	-1.94	-2.14	-2.14	-1.94	2.1	52.9
KG	Animal food	1.15	4.36	4.84	3.79	0.84	0.57	1.7	85.3	GE	Toiletries	-1.31	-1.09	-1.24	-1.30	-1.54	-1.69	2.2	55.1
GC	Basic organic chemicals	-2.08	-1.43	-1.00	-0.46	0.39	0.52	2.2	87.5	CA	Iron and Steel	-2.11	-0.80	-1.65	-2.06	-1.39	-1.68	1.9	57.0
NB	Non-monetary gold	0.00	0.00	0.00	0.76	0.47	0.34	0.3	87.9	DA	Yarns fabrics	-1.28	-2.41	-2.63	-2.53	-1.84	-1.62	2.2	59.2
FV	Ships	-2.61	-0.54	-0.36	-0.10	-0.06	0.10	0.1	88.0	GF	Pharmaceuticals	-1.40	-0.60	-0.75	-0.97	-1.23	-1.51	1.8	60.9
KA	Cereal products	-0.04	0.21	0.38	0.26	0.03	0.07	0.3	88.3	FI	Precision instruments	-2.09	-1.10	-1.77	-1.31	-1.25	-1.49	1.5	62.5
KI	Manufactured tobaccos	-0.01	-0.27	-0.22	-0.22	-0.01	0.03	0.1	88.4	DE	Leather	-0.14	-0.68	0.00	-1.24	-1.37	-1.40	1.6	64.1

1. RCA: Revealed comparative advantage indicator (Xi/Sum(Xi)-Mi/Sum(Mi)).
Source: CEPII, CHELEM database and OECD.

Table 2.A1.7. **Structure of specialisation over time: Mexico**

		RCA[1]					Export share				RCA[1]					Import share	
code	title	1970	1980	1990	1995	2001		cumu-lative	code	title	1970	1980	1990	1995	2001		cumu-lative
IB	Crude oil	2.4	47.1	20.9	9.0	7.9	1.9	1.9	GH	Plastic articles	-1.5	-2.0	-2.6	-3.6	-4.5	5.6	5.6
FT	Cars and cycles	-1.9	-0.3	5.1	8.8	6.9	6.6	8.5	FL	Electronic components	0.0	-0.1	-1.0	-4.4	-4.4	5.7	11.3
FO	Computer equipment	-0.8	-1.0	-0.1	0.5	4.1	7.3	15.8	FS	Vehicles components	-5.3	-6.0	-5.3	-4.8	-3.3	6.7	18.0
FU	Commercial vehicles	-2.7	-1.8	0.0	2.5	3.9	7.5	23.4	FG	Specialised machines	-7.0	-5.2	-3.6	-3.2	-2.4	2.7	20.7
FM	Consumer electronics	-0.2	-1.1	2.7	4.2	3.9	34.3	57.7	DA	Yarns fabrics	0.6	-0.3	-0.9	-0.7	-2.1	2.8	23.5
FN	Telecommunications equipment	-1.2	2.3	-2.0	-0.1	2.3	28.9	86.6	IH	Refined petroleum products	-0.6	0.5	-0.9	-1.1	-1.9	2.5	26.0
DB	Clothing	0.0	0.2	0.5	0.7	2.1	6.4	92.9	FB	Miscellaneous hardware	-2.1	-2.2	-2.2	-2.7	-1.7	4.6	30.6
EB	Furniture	0.2	0.1	0.5	0.8	1.4	26.8	119.7	EC	Paper	-3.2	-2.2	-2.1	-2.7	-1.7	2.2	32.8
DC	Knitwear	0.1	0.1	0.0	0.5	1.4	5.3	125.0	GC	Basic organic chemicals	-3.8	-3.1	-1.1	-1.3	-1.7	2.3	35.1
KH	Beverages	0.4	0.2	0.7	0.7	0.9	33.5	158.5	JA	Cereals	-1.4	-5.6	-2.4	-1.5	-1.3	1.3	36.5
JB	Other edible agricultural prod.	20.2	3.3	4.1	3.0	0.9	43.0	201.5	CA	Iron and Steel	-0.8	-5.0	-1.6	-0.1	-1.2	1.8	38.2
FR	Electrical apparatus	-2.3	-0.5	1.6	-0.1	0.7	0.6	202.1	FC	Engines	-4.7	-5.4	-0.5	-0.1	-1.0	4.7	42.9
FI	Precision instruments	-1.8	-1.2	-1.2	0.2	0.7	3.7	205.9	FE	Machine tools	-2.6	-2.7	-1.2	-1.0	-0.9	1.0	43.9
FP	Domestic electrical appliances	-0.2	-0.3	0.1	0.4	0.7	33.3	239.2	JC	Non-edible agricultural prod.	7.7	0.6	-0.7	-0.6	-0.9	1.1	45.0
FQ	Electrical equipment	-1.0	-0.3	0.1	0.2	0.5	15.5	254.7	GI	Rubber articles (incl. tyres)	-0.3	-0.6	-0.6	-0.7	-0.8	1.1	46.1
NV	N.e.s. products	1.2	0.3	-0.7	-0.3	0.3	56.7	311.4	KB	Fats	-1.8	-1.6	-2.1	-1.3	-0.8	0.8	46.9
DD	Carpets	-0.1	0.1	0.1	0.3	0.1	76.0	387.3	KC	Meat	7.7	1.9	0.1	0.1	-0.7	1.2	48.1
BA	Cement	0.1	0.0	0.3	0.2	0.1	95.9	483.3	FW	Aeronautics	-2.7	-2.6	-1.3	-0.2	-0.7	0.7	48.8
GG	Plastics	-0.3	-0.3	0.0	0.2	0.0	14.0	497.3	GE	Toiletries	-0.4	-0.8	-0.6	-0.6	-0.6	1.2	50.0
BC	Glass	-0.1	0.0	0.3	0.2	0.0	28.4	525.7	IC	Natural gas	-0.8	2.6	0.1	-0.3	-0.6	0.7	50.7

1. RCA: Revealed comparative advantage indicator (Xi/Sum(Xi)-Mi/Sum(Mi)).
Source: CEPII, CHELEM database and OECD.

Table 2.A1.7. **Structure of specialisation over time: Mexico (*continued*)**

		RCA[1]					Export share				RCA[1]					Import share	
Code	Title	1970	1980	1990	1995	2001		Cumu-lative	Code	Title	1970	1980	1990	1995	2001		Cumu-lative
IB	Crude oil	2.4	47.1	20.9	9.0	7.9	1.9	1.9	GH	Plastic articles	-1.5	-2.0	-2.6	-3.6	-4.5	5.6	5.6
FT	Cars and cycles	-1.9	-0.3	5.1	8.8	6.9	6.6	8.5	FL	Electronic components	0.0	-0.1	-1.0	-4.4	-4.4	5.7	11.3
FO	Computer equipment	-0.8	-1.0	-0.1	0.5	4.1	7.3	15.8	FS	Vehicles components	-5.3	-6.0	-5.3	-4.8	-3.3	6.7	18.0
FU	Commercial vehicles	-2.7	-1.8	0.0	2.5	3.9	7.5	23.4	FG	Specialised machines	-7.0	-5.2	-3.6	-3.2	-2.4	2.7	20.7
FM	Consumer electronics	-0.2	-1.1	2.7	4.2	3.9	34.3	57.7	DA	Yarns fabrics	0.6	-0.3	-0.9	-0.7	-2.1	2.8	23.5
FN	Telecommunications equipment	-1.2	2.3	-2.0	-0.1	2.3	28.9	86.6	IH	Refined petroleum products	-0.6	0.5	-0.9	-1.1	-1.9	2.5	26.0
DB	Clothing	0.0	0.2	0.5	0.7	2.1	6.4	92.9	FB	Miscellaneous hardware	-2.1	-2.2	-2.2	-2.7	-1.7	4.6	30.6
EB	Furniture	0.2	0.1	0.5	0.8	1.4	26.8	119.7	EC	Paper	-3.2	-2.2	-2.1	-2.7	-1.7	2.2	32.8
DC	Knitwear	0.1	0.1	0.0	0.5	1.4	5.3	125.0	GC	Basic organic chemicals	-3.8	-3.1	-1.1	-1.3	-1.7	2.3	35.1
KH	Beverages	0.4	0.2	0.7	0.7	0.9	33.5	158.5	JA	Cereals	-1.4	-5.6	-2.4	-1.5	-1.3	1.3	36.5
JB	Other edible agricultural prod.	20.2	3.3	4.1	3.0	0.9	43.0	201.5	CA	Iron and Steel	-0.8	-5.0	-1.6	-0.1	-1.2	1.8	38.2
FR	Electrical apparatus	-2.3	-0.5	1.6	-0.1	0.7	0.6	202.1	FC	Engines	-4.7	-5.4	-0.5	-0.1	-1.0	4.7	42.9
FI	Precision instruments	-1.8	-1.2	-1.2	0.2	0.7	3.7	205.9	FE	Machine tools	-2.6	-2.7	-1.2	-1.0	-0.9	1.0	43.9
FP	Domestic electrical appliances	-0.2	-0.3	0.1	0.4	0.7	33.3	239.2	JC	Non-edible agricultural prod.	7.7	0.6	-0.7	-0.6	-0.9	1.1	45.0
FQ	Electrical equipment	-1.0	-0.3	0.1	0.2	0.5	15.5	254.7	GI	Rubber articles (incl. tyres)	-0.3	-0.6	-0.6	-0.7	-0.8	1.1	46.1
NV	N.e.s. products	1.2	0.3	-0.7	-0.3	0.3	56.7	311.4	KB	Fats	-1.8	-1.6	-2.1	-1.3	-0.8	0.8	46.9
DD	Carpets	-0.1	0.1	0.1	0.3	0.1	76.0	387.3	KC	Meat	7.7	1.9	0.1	0.1	-0.7	1.2	48.1
BA	Cement	0.1	0.0	0.3	0.2	0.1	95.9	483.3	FW	Aeronautics	-2.7	-2.6	-1.3	-0.2	-0.7	0.7	48.8
GG	Plastics	-0.3	-0.3	0.0	0.2	0.0	14.0	497.3	GE	Toiletries	-0.4	-0.8	-0.6	-0.6	-0.6	1.2	50.0
BC	Glass	-0.1	0.0	0.3	0.2	0.0	28.4	525.7	IC	Natural gas	-0.8	2.6	0.1	-0.3	-0.6	0.7	50.7

1. RCA: Revealed comparative advantage indicator (Xi/Sum(Xi)-Mi/Sum(Mi)).
Source: CEPII, CHELEM database and OECD.

Table 2.A1.8. **Structure of specialisation over time: Ireland**

		RCA[1]					Export share				RCA[1]					Import share	
Code	Title	1970	1980	1990	1995	2001		Cumu-lative	Code	Title	1970	1980	1990	1995	2001		Cumu-lative
GC	Basic organic chemicals	-0.51	5.05	4.67	6.52	16.16	19.6	19.6	FL	Electronic components	0.37	0.79	-1.20	-1.73	-4.17	9.4	9.4
GF	Pharmaceuticals	0.55	0.29	1.53	2.54	7.36	10.5	30.0	FT	Cars and cycles	-3.60	-3.08	-3.31	-2.94	-3.55	4.0	13.3
FO	Computer equipment	-0.90	2.61	10.23	4.92	5.94	25.5	55.5	FW	Aeronautics	-0.91	-0.19	-1.49	-0.86	-2.08	2.5	15.9
GE	Toiletries	-0.55	-0.20	0.51	0.34	2.55	4.1	59.7	GH	Plastic articles	-1.97	-1.36	-2.48	-2.84	-1.90	2.6	18.5
EE	Miscellaneous manuf. articles	-0.41	0.11	3.55	5.15	2.37	5.4	65.1	IH	Refined petroleum products	-2.27	-8.75	-2.96	-1.39	-1.58	1.8	20.3
KE	Preserved fruits	0.00	1.87	3.92	5.21	1.18	1.9	67.0	FR	Electrical apparatus	-2.10	-0.97	-1.00	-1.78	-1.52	3.8	24.2
KC	Meat	15.53	13.35	5.46	3.90	1.17	1.7	68.7	EC	Paper	-2.15	-2.05	-2.73	-2.55	-1.38	1.6	25.7
KB	Fats	6.32	6.62	3.02	2.92	0.67	1.3	70.0	FB	Miscellaneous hardware	-2.12	-1.01	-1.08	-1.16	-1.30	1.8	27.6
FI	Precision instruments	1.16	1.42	1.06	0.29	0.55	2.1	72.1	FN	Telecommunications equipment	-0.61	-0.32	-0.07	0.65	-1.29	5.4	32.9
HB	Non ferrous ores	3.25	1.22	0.67	0.26	0.16	0.4	72.5	IB	Crude oil	-2.83	-3.95	-1.47	-0.92	-1.18	1.2	34.1
FK	Optics	-0.23	-0.10	0.25	0.00	0.09	0.5	73.1	DC	Knitwear	0.98	-0.52	-0.72	-0.55	-1.05	1.2	35.3
NV	N.e.s. products	3.50	2.78	2.33	1.93	0.08	3.9	77.0	DB	Clothing	1.41	-0.77	-1.40	-1.10	-1.04	1.3	36.6
KD	Preserved meat/fish	3.30	1.25	0.12	0.08	0.04	0.4	77.4	FG	Specialised machines	-3.56	-1.76	-1.69	-1.32	-0.96	1.2	37.8
GG	Plastics	-0.48	0.41	0.29	0.13	0.00	0.1	77.5	JB	Other edible agricultural prod.	7.32	1.49	-0.21	-0.61	-0.95	1.3	39.1
HA	Iron ores	0.04	0.05	-0.12	-0.08	0.00	0.0	77.5	FU	Commercial vehicles	-1.61	-1.26	-1.78	-1.14	-0.94	1.1	40.2
II	Electricity	0.00	0.00	0.00	0.00	0.00	0.0	77.5	CC	Non ferrous metals	-1.17	-1.03	-1.31	-1.30	-0.76	0.9	41.1
KI	Manufactured tobaccos	0.19	0.04	0.03	0.10	0.00	0.1	77.6	DE	Leather	1.35	-0.55	-1.14	-0.87	-0.71	0.8	41.9
IG	Coke	0.04	0.01	-0.01	0.00	0.00	0.0	77.6	CA	Iron and Steel	-2.19	-1.49	-0.86	-0.89	-0.64	0.7	42.6
NB	Non-monetary gold	0.00	0.00	0.00	-0.03	-0.01	0.0	77.6	IC	Natural gas	-0.05	-0.37	-0.08	-0.06	-0.63	0.7	43.3
HC	Unprocessed minerals n.e.s.	1.13	0.54	0.36	0.12	-0.03	0.2	77.8	EB	Furniture	-0.16	-0.38	-0.32	-0.23	-0.55	0.7	44.0

1. RCA: Revealed comparative advantage indicator (Xi/Sum(Xi)-Mi/Sum(Mi)).
Source: CEPII, CHELEM database and OECD.

Table 2.A1.9. **Structure of specialisation over time: Korea**

		RCA[1]					Export share				RCA[1]					Import share	
Code	Title	1970	1980	1990	1995	2001		Cumulative	Code	Title	1970	1980	1990	1995	2001		Cumulative
FT	Cars and cycles	-0.99	0.52	3.66	6.56	8.69	8.9	8.9	IB	Crude oil	-5.99	-23.95	-9.18	-8.19	-15.45	15.5	15.5
FN	Telecommunications equipment	-0.81	-0.41	1.58	1.45	5.85	8.4	17.4	IC	Natural gas	0.00	-0.06	-1.21	-1.62	-3.73	3.8	19.3
FV	Ships	-1.77	1.93	3.18	2.95	5.38	5.7	23.0	NV	N.e.s. products	-0.86	-0.87	-1.81	-1.71	-2.15	2.2	21.4
FO	Computer equipment	-0.29	-0.26	1.74	2.39	4.68	8.4	31.5	FI	Precision instruments	-0.98	-0.63	-2.05	-2.51	-1.74	2.2	23.7
DA	Yarns fabrics	5.17	4.60	5.31	6.15	4.45	6.6	38.0	JC	Non-edible agricultural prod.	-4.32	-1.96	-4.87	-3.20	-1.73	1.9	25.6
GH	Plastic articles	-1.56	0.12	0.12	2.38	2.78	4.5	42.5	IA	Coals	0.46	-1.69	-1.79	-1.49	-1.68	1.7	27.3
FM	Consumer electronics	0.49	4.28	6.40	3.29	1.69	2.2	44.8	CC	Non ferrous metals	-0.35	-0.88	-2.03	-2.61	-1.50	2.7	29.9
IH	Refined petroleum products	0.12	-1.97	-2.47	-1.24	1.50	5.0	49.7	HA	Iron ores	-2.20	-1.70	-1.43	-1.23	-1.27	1.3	31.2
FP	Domestic electrical appliances	-0.10	0.10	0.99	1.34	1.13	1.4	51.1	HB	Non ferrous ores	2.66	-0.85	-1.31	-0.99	-1.14	1.2	32.4
DC	Knitwear	11.08	4.55	3.99	1.57	0.88	1.3	52.4	FG	Specialised machines	-5.83	-2.17	-4.48	-4.07	-1.14	2.5	35.0
GI	Rubber articles (incl. tyres)	0.24	2.73	1.29	1.01	0.88	1.1	53.6	KC	Meat	4.23	3.34	0.70	-0.07	-1.07	1.7	36.6
DE	Leather	2.79	6.15	11.21	2.25	0.73	1.6	55.2	GE	Toiletries	-0.72	-0.93	-0.94	-0.98	-1.01	1.4	38.0
FU	Commercial vehicles	-2.56	1.20	0.78	1.09	0.72	1.0	56.1	JA	Cereals	-12.21	-4.48	-1.75	-1.18	-0.95	1.0	39.0
DD	Carpets	1.03	3.27	1.01	0.60	0.71	0.8	57.0	FK	Optics	0.00	0.18	-0.12	-0.54	-0.91	1.6	40.6
FF	Construction equipment	-1.37	-0.59	-0.68	0.10	0.55	0.9	57.9	FR	Electrical apparatus	-1.40	-0.21	-0.72	2.25	-0.89	3.6	44.2
FB	Miscellaneous hardware	-0.69	2.17	0.13	0.23	0.52	2.3	60.2	FW	Aeronautics	-0.57	-1.07	-1.59	-1.81	-0.89	1.3	45.6
GG	Plastics	-1.76	-0.39	-0.06	0.57	0.46	0.8	61.0	GA	Basic inorganic chemicals	-0.59	-0.42	-0.71	-0.73	-0.69	1.0	46.6
CA	Iron and Steel	-2.26	3.11	0.34	-0.87	0.46	3.3	64.3	GD	Paints	-0.64	-0.58	-0.96	-0.78	-0.55	1.2	47.8
DB	Clothing	11.59	8.58	4.88	1.07	0.40	1.1	65.4	FE	Machine tools	-1.23	-1.45	-1.88	-1.55	-0.54	1.0	48.8
CB	Tubes	-0.61	1.69	0.47	0.24	0.38	0.7	66.1	GF	Pharmaceuticals	-0.59	-0.15	-0.22	-0.28	-0.51	0.7	49.5

1. RCA: Revealed comparative advantage indicator (Xi/Sum(Xi)-Mi/Sum(Mi)).
Source: CEPII, CHELEM database and OECD.

Notes

1. Moreover, concerns about national competitiveness have also raised criticisms within the economics' profession. In the context of the debate about 'strategic trade policy', an influential paper by Krugman (1994) argued that international competitiveness is typically a partial equilibrium concept and can lead to ill-designed policy recommendations. State intervention to promote sectoral competitiveness or "picking-the-winner" is typically not very effective. Moreover, while absolute comparisons of products and prices make sense at the enterprise level they cannot embrace market forces that influence countries to specialise or not in certain types of products. For that, the Ricardian concept of comparative advantage should apply.

2. Previous studies have used a similar taxonomy to analyse the interaction between trade and wages in the OECD countries (Oliveira Martins, 1994) and to interpret the level and cyclicality of mark-ups (Oliveira Martins *et al.*, 1996).

3. The classification of industries could also have been carried out using a statistical clustering procedure. Nonetheless, this approach is very sensitive to the extreme values of the SCR indicator for some industries. Moreover, a statistical clustering also comprises a certain degree of judgemental criteria for defining the threshold for distance across the different clusters.

4. Noteworthy, these rank correlations are rather stable over time and therefore do not depend much on the specific year chosen for the comparison.

5. This is usually referred to as tariff escalation.

6. A more complete structure of revealed comparative advantages by country, together with export and import shares, is given in the Annex.

7. Due to lack of space, this analysis is not provided here but could be provided by the authors upon request.

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