

Spinanger, Dean

**Working Paper — Digitized Version**

## Does trade performance say anything about efficient industrialization policies? Some evidence from Pacific Rim Countries

Kiel Working Paper, No. 302

**Provided in Cooperation with:**

Kiel Institute for the World Economy – Leibniz Center for Research on Global Economic Challenges

*Suggested Citation:* Spinanger, Dean (1987) : Does trade performance say anything about efficient industrialization policies? Some evidence from Pacific Rim Countries, Kiel Working Paper, No. 302, Kiel Institute of World Economics (IfW), Kiel

This Version is available at:

<https://hdl.handle.net/10419/47034>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# Kieler Arbeitspapiere Kiel Working Papers

---

Kiel Working Paper No. 302

Does Trade Performance Say Anything About  
Efficient Industrialization Policies?  
Some Evidence from Pacific Rim Countries\*

by

Dean Spinanger

Institut für Weltwirtschaft an der Universität Kiel

The Kiel Institute of World Economics

ISSN 0342-0787

Kiel Institute of World Economics  
Department IV  
Düsternbrooker Weg 120, D-2300 Kiel

Kiel Working Paper No. 302

Does Trade Performance Say Anything About  
Efficient Industrialization Policies?  
Some Evidence from Pacific Rim Countries\*

by

Dean Spinanger

October 1987

Ag 4577/87  
Weltwirtschaftliches  
Institut  
Kiel

\*The author would like to express his thanks to Ulrich Hiemenz, Seev Hirsch and James Riedel for comments on an earlier draft as well for productive discussions on various issues therein. The usual waiver applies.

The author himself, not the Kiel Institute of World Economics, is solely responsible for the contents and distribution of each Kiel Working Paper.

Since the series involves manuscripts in a preliminary form, interested readers are requested to direct criticisms and suggestions directly to the author and to clear any quotations with him.

ISSN 0341 - 0787

Table of Contents

	<u>Page</u>
I. Introduction and Relevance	1
II. Trade, Prices, the Structure of Production and Distortions	3
III. Trade Performance and the Factor Intensity of Trade: Background and Measurement	11
IV. Trade Performance, the Foreign/Domestic Market Interface and the Factor Intensity of Trade: The Distortions	17
The Foreign/Domestic Market Interface: Exchange and Trade/Transactions Regulations	17
Distortions in Domestic Labor Markets	20
Distortions in Domestic Capital Markets	25
V. Concluding Remarks	30
Appendix A - Tables	36
Appendix B - Constructing a New Indicator of the Factor Intensity of Trade: Background and Approach	41
Bibliography	50

Tables

Table 1 - Economic Performance and Distortion Levels in Labor, Capital and Exchange Rate Markets - Evidence from DCs for the 70's	7
Table 2 - Non-oil Manufactured Exports of Selected Industrializing and Industrialized Countries, 1965-1983	9
Table 3 - Shifts in Export Shares in Industries with Definitely Low (LI) or Definitely High Physical Capital Intensities (PCI) for Exports to World	15
Table 4 - Shifts in Export Shares in Industries with Definitely Low (LI) or Definitely High Human Capital Intensities (HHCI) for Exports to World	16

	<u>Page</u>
Table 5 - Overview of Minimum Wages, Wage Rates and Costs of Capital	22
Table 6 - EPZs and Imports of Electronics industry Products into OECD Countries from Selected Developing Countries, 1965-1983	24
Table 7 - Real Rates of Interest in Selected Countries, 1965-1982	29
Table 8 - Winners and Losers in World Trade of Manufactures: 1965-1983	31
Table 9 - Singapore's Unit Labor Costs Relative to Asian Competitors and Selected Industrialized Countries	34

Diagram

Diagram 1 - Effective Real Exchange Rate Changes	19
--	----

Appendix Tables

Table A1 - Growth Rates of Exports, GDP as well as Industrial Production and Distortion Levels for Labor Markets, Capital Markets as well as Exchange Rates: Selected LDCs in the 1970's	36
Table A2 - Growth Rates of Non-energy Exports from Industrialized (ICs) and Developing Countries (DCs): 1965-83	37
Table A3 - Structure of Non-energy Exports from Industrialized (ICs) and Developing Countries (DCs): 1965-83	38
Table A4 - Changes in DC/IC Exports from PACRIM and Other NICs by Major Product Groups: 1965 - 1983	39
Table A5 - Overview of Important Exchange Rate, Trade and Transaction Regulations/Restrictions: 1965-1984	40
Table B1 - Classification of Definitely Labour Intensive Industries (LI) in Years around 1970 and 1980	45

	<u>Page</u>
Table B2 - Classification of Definitely Physical Capital Intensive Industries (PCI) in Years around 1970 and 1980	46
Table B3 - Classification of Definitely Low Human Capital Intensive Industries (LHCI) in Years around 1970 and 1980	47
Table B4 - Classification of Definitely High Human Capital Intensive Industries (HHCI) in Years around 1970 and 1980	48
Table B5a - Factor Intensity Agreements between US and Other Sample Countries	49
Table B5b - Factor Intensity Agreements between Singapore and Other Sample Countries	49
Table B5c - Factor Intensity Agreements between Taiwan and Other Sample Countries	49

## I. Introduction and Relevance

Throughout mainstream economic development literature and, in particular, the analysis of international trade performance, references to the importance of allowing factor prices in a given land to reflect the relative scarcity of its factors of production abound. The consequences for developing countries (DCs) of specialization in the production of goods using more of the factors of production, with which they are better endowed, are stated to be a more efficient economy, which provides the basis for faster growth and a higher degree of competitiveness in world markets. That is to say, in countries with highly distorted factor (and product) markets economic development will be hampered or rather the degree of competitiveness in world markets will be negatively influenced. Notwithstanding the fundamental implications of the impact of domestic market distortions on performance in world trade for development policy recommendations, Krueger (1984, p. 555) notes that "relatively little empirical work has been undertaken to estimate their magnitude or their affects". It is the latter aspect which is dealt with in this paper, namely the impact of distortions on the performance of countries in world trade with particular reference paid to Pacific Rim (PACRIM) Countries. Specifically, it intends to yield evidence on the relevance of ensuring that, in particular, domestic factor markets are relatively free from those influences (i.e. policy measures) which cause production to be shifted out of areas of comparative advantage.

This problem is approached in a reversed fashion; i.e. first the evidence on performance is reviewed before prevailing policy measures are touched upon with respect to their hypothesized impact on the factor intensity of production. The paper begins by presenting a brief review of theoretical and quantitative issues in connection with trade performance and distortions. In this context quantitative evidence on the interrelations between economic performance and distortions is presented, thereby lending credence to the approach taken and serving as a starting point for the analysis. It then places

the trade performance of Pacific Rim countries versus other developing countries into a perspective to allow performance and distortion indicators to be quickly compared throughout the remainder of the analysis. Based on this performance ranking the paper proceeds to examine the general impact of industrialization policies as reflected in the factor intensity of exports, realizing that overall policies, which caused one factor of production to be relatively cheaper than another, will tend to lead to an allocation of resources into industries using the cheaper factor more intensively. In structuring an indicator of export factor intensity, evidence is presented on the reliability of indigenous vs. numeraire factor intensity indicators and of changes therein over time. Chapter IV then deals with export performance and the specifics of industrialization policies as incorporated in their impact on labor and capital markets, not forgetting thereby the importance of the domestic/foreign market interface. The paper concludes with comments on the structuring of efficient industrialization policies.



## II. Trade, Prices, the Structure of Production and Distortions

Was it not Sir Arthur Lewis who noted that Jamaica could solve its development problems if it could only hook up to world trade in manufactures growing at a rate of 10% per annum? And what kept it from doing so or rather why did the Pacific Rim Countries - as shown above - perform so well in export markets? Mainstream international trade theory roughly tells us, that specialization in the manufacturing of a product which uses the factors of production in a given country in line with their relative factor endowment (reflected in the relative factor prices), ensures that efficiency conditions prevail. While the theory does not allow explicit conclusions to be drawn about the relative performance of products manufactured in such a manner in world markets, it seems congruent to deduce that -- over a longer period of time and for a wider spectrum of products - in those cases where relative prices are less distorted, export performance will tend to be better than in those cases where distortions abound.

The logic behind this conclusion is based on the dominant role played by prices in market-oriented economies. They not only determine the demand for and supply of labor/capital (i.e. in factor markets) they also signal to entrepreneurs where gaps between supply and demand exist or are developing (i.e. in product markets). Entrepreneurs, in reacting to such market signals (e.g. increasing prices) do so because of the existence of economic incentives in the form of profits from additional or new production. Being able to correctly perceive where imbalances are occurring and likewise being able to efficiently tap the factor market, resources will be utilized in a manner which yields the highest return for a given country. Given flexible entrepreneurs as well as an efficiently functioning interfacing between the domestic and foreign sectors the size of the market which can be tapped and hence the possible gains, which can be reaped by doing so, increase.

While the existence of economic incentives alone is not necessarily a sufficient condition to induce an economy to move faster down the road of economic development, their crucial role has become well documented ever since it was duly appreciated in the mid sixties. Since then, a wealth of systematically collected data and information on development strategies from a wide range of countries has been gathered and analyzed (see Hiemenz, Langhammer (1986) for an overview). In essence these studies present a clear picture of the positive impact that competition has in ensuring an efficient allocation of resources. Thereby it was usually determined that competition with foreign counterparts tended to serve the function of an acid test for the economic viability of ongoing businesses. This being the case the studies - quite congruently - point to the importance of reducing or eliminating protection, at least to the extent that infant industry arguments are not deemed relevant, in order to remain or become competitive.

However, becoming competitive vis-à-vis foreign counterparts not only means being placed on the same footing with foreign counterparts as concerns access to primary and intermediary inputs at world market prices, as well as to the necessary domestic/foreign financial facilities. It also embodies eliminating all those measures which impact directly on the prices of the factors of production or indirectly on the production process through the economic environment<sup>1</sup>. In Krueger's 1983 synthesis of analyses carried out on 15 countries, the impact of various policies on the relative price of labor to capital is neatly summarized (see Table 7.1). In all those countries with specific policies, labor to capital price ratios were in-

---

<sup>1</sup> In Krueger's (1977) seminal essay on growth, trade and distortions, which served as an analytical framework for a 15 country NBER sponsored project on trade and employment (Krueger, 1983, p. ix-x) the ramifications and weakness of mainstream international trade theory in connection with distortions are aptly described. In up-dating this essay in 1984 she is able to chew on numerous new specifications, but still concludes the section on the trade impact of distortions as noted at the outset. For a more recent attempt, albeit without specifically dealing with distortions, see Kotlikoff, Leamer (1987).

creased by 10% (Korea) to 316% (Pakistan). Hooking up these (and other) distortions to their relative performance in world trade was, however, not attempted.

Before dealing with the impact of these distortions, two caveats seem necessary. First of all, since the entire spectrum of distortions permeates all facets of the demand for supply of labor and capital, a clear-cut identification and interpretation must give way to more cautious conclusions. Secondly, aspects of more overriding nature, like shifts in demand or changes in intercountry social preference differentials, may go unnoticed and thus mask over or exaggerate underlying trends.

Regardless of theoretical considerations, the fundamental question must be asked - given the lack of evidence as pointed out by Krueger (see Introduction) - whether anything can really be revealed at the high levels of aggregation. Perhaps distortions in factor markets are themselves so strongly distorted by other measures that treating them separately will produce but little evidence on their impact. To attempt to engender some initial evidence on the impact of the interconnections between distortions and economic performance a pedestrian approach was taken. This is based on data from 31 countries for the 1970's gathered for a World Bank research project (Agarwala, 1983) dealing with price distortions in factor/product markets and performance (i.e. growth rates) of the economy or sectors therein. Out of this data set, distortions in connection with the cost of labor, the cost of capital and the domestic-world market interfacing (i.e. exchange rates) vis-à-vis economic performance variables (i.e. GDP growth rate, growth rate of industry and growth rate of real exports) were extracted and are examined here<sup>1</sup>. For each of the above areas, that is in connection with the cost of labor, the cost of capital and ex-

---

<sup>1</sup> Distortions also covered in Agarwala's paper included protection, agricultural pricing, pricing of infrastructural services and inflation.

change rates, for each country the distortion level was classified as being low, medium or high. The economic performances (e.g. growth rate of GDP) for all those countries classified as having a given distortion level were then summed up to produce an (unweighted) average performance figure (i.e. growth rate) for a given distortion level.

These calculations are presented in Table 1. To be sure, the evidence presented therein is quite straightforward as higher economic performance (i.e. higher growth rates for GDP, industrial production and exports) is seen to be correlated with lower distortion levels. Most encouraging, however, is the simple fact that this relationship is the strongest in the case of export growth rates and distortions in labor markets: For those countries with low distortion levels in labor markets real exports grew at a rate of 6.5%/year, whereas for those with high distortion levels in labor markets the rate of growth was -0.3%/year. Without wanting to overinterpret or overemphasise these results, realizing the possible deficiencies attached to constructing such distortion indices, but rather merely assuming that the basic thrust revealed in the table does indeed reflect real world happenings, then the evidence seems like a reasonable starting point from which the analysis can begin.

Beyond this, and just as important in a paper which deals with LDCs' performance in export markets, is the fact that it is precisely the correlation between labor market distortions and export growth which proved to be the highest. In other words, when distortions occur in the area where LDCs are assumed to have their comparative advantage vis-à-vis ICs in producing goods for world markets, export performance is negatively influenced the most<sup>1</sup>.

---

<sup>1</sup> One would almost be inclined to say that "getting the prices right" surely does seem to matter.

Table 1 - Growth Rates<sup>a</sup> of GDP, Industrial Production and Exports vis-à-vis Distortion Levels in Labor (A), Capital (B) and Exchange Rate Markets (C) - Evidence from DCs for the 70's

Area in which distortions measured	Growth Rates <sup>a</sup> of		
	GDP	Industrial production	Exports
<u>LOW LEVELS OF DISTORTIONS</u>			
A. Labor	5.9	7.3	6.5
B. Capital	4.6	5.7	5.1
C. Exchange rates	6.1	7.7	4.5
Average of A+B+C	5.5	6.9	5.4
<u>MEDIUM LEVELS OF DISTORTIONS</u>			
A. Labor	4.7	6.1	2.7
B. Capital	6.1	8.0	4.5
C. Exchange rates	3.6	4.2	1.1
Average of A+B+C	4.8	6.1	2.8
<u>HIGH LEVELS OF DISTORTIONS</u>			
A. Labor	4.5	4.3	-0.3
B. Capital	4.0	4.3	2.3
C. Exchange rates	3.2	3.1	2.9
Average of A+B+C	3.9	3.9	1.6

Note: for an explanation of table see text; for a listing of the countries with their corresponding distortion levels and growth rates see Appendix-Table A1.

<sup>a</sup>Real growth rates, per annum basis.

Source: Agarwala (1983), Tables 6, 8 and 10.

In order to be able to directly interface export performance of a set of countries with various distortions indicators for the same set of countries, tables structured exactly along the lines of Table 2 have been set up. Table 2 contains the base information about the overall performance of 21 major DC exporters of manufactures (as well as four industrialized countries for comparison's sake) for the time period 1965-1983<sup>1</sup>. Since the ranking of the countries in this table is repeated in the tables capturing distortions throughout the rest of paper, it is essential that the reader understands it and is particularly aware of the following points:

- Manufacturing exports have been calculated using a concordance between the standard international trade classification (SITC - Rev. 1) and the international standard industrial classification (ISIC)<sup>2</sup>. They have been defined to encompass all manufacturing industries (including food processing) except petroleum refining (353) and products therefrom (354).
- The ranking of the industrializing countries is determined by the value of manufacturing exports in the year 1983. To portray the crucial performance aspect the ranking in 1965 (and specifically in Table 2 also in 1973) is included in () directly following the country name. The ranking of exports by value in 1983 is distorted by some countries including re-exports in their statistics (i.e. Hong Kong and Singapore)

---

<sup>1</sup> For overall comparative purposes statistics on growth and structure of world trade are included in Appendix Tables A2 and A3. Table A4 provides more detailed information on the specific commodity performance of PACRIM countries vis-à-vis other selected NICs. It is left up to the reader to verify the spectrum of success which the PACRIM countries exhibited.

<sup>2</sup> Concordance can be made available upon request.

Table 2 - Non-oil Manufactured Exports<sup>a</sup> of Selected Industrializing and Industrialized Countries, 1965-1983

Countries <sup>b</sup>	Rank	Rank	Value (Mill. US\$)			Share of Manufactures in Total Exports			Annual Rate of Change (%) <sup>c</sup>	
	in 1965	in 1973	1965	1973	1983	1965	1973	1983	1965-73	1973-83
<u>Industrializing Countries</u>										
1. Taiwan	(12)	(2)	307.8	3788.0	22663.0	68.4	86.4	90.1	36.9	19.6
2. Korea, R.	(19)	(5)	128.4	2704.0	21556.0	73.4	84.1	88.2	46.4	23.1
3. Brazil	(3)	(1)	977.1	3915.4	15286.6	61.2	63.2	69.8	19.0	14.6
4. Singapore	(6)	(6)	565.3	2310.0	13981.8	58.1	64.0	64.0	19.2	19.7
5. Hong Kong	(4)	(3)	816.8	3603.6	13595.7	92.9	95.2	95.3	20.4	14.2
6. China, P.R.	(2)	(4)	1174.5	3013.9	12378.7	68.8	68.2	62.8	12.5	15.2
7. Mexico	(7)	(8)	537.7	1934.3	8867.9	51.6	73.5	33.9	17.4	16.5
8. Malaysia	(5)	(10)	693.0	1555.2	7037.4	57.5	51.2	49.3	10.6	16.3
9. India	(1)	(7)	1196.8	2095.6	4738.2	71.2	70.1	59.6	7.3	8.5
10. Thailand	(14)	(12)	287.1	789.6	3971.0	47.3	51.7	63.3	13.5	17.5
11. Turkey	(16)	(13)	243.4	753.4	3773.2	51.1	57.2	66.5	15.2	17.5
12. Indonesia	(15)	(15)	263.7	672.1	3638.4	36.5	20.9	17.2	12.4	18.4
13. Argentina	(8)	(9)	517.2	1582.9	3350.0	34.6	48.5	42.8	15.0	7.8
14. Philippines	(9)	(11)	369.0	877.0	2612.8	48.2	48.8	52.6	11.4	11.5
15. Pakistan	(11)	(16)	324.6	659.3	2224.9	61.5	70.1	72.7	9.3	12.9
16. Colombia	(13)	(14)	291.2	749.9	1891.2	54.0	63.8	61.4	12.6	9.7
17. Morocco	(17)	(18)	193.2	457.3	1090.4	44.9	52.2	52.9	11.4	9.1
18. Ivory Coast	(18)	(19)	131.7	364.0	1066.4	47.5	42.3	51.6	13.6	11.4
19. Tunisia	(21)	(20)	74.1	197.3	860.4	61.9	51.2	46.0	13.0	15.9
20. Egypt	(10)	(17)	325.4	618.4	735.2	53.9	55.4	18.0	8.4	1.8
21. Kenya	(20)	(21)	76.0	195.6	507.2	57.7	56.0	53.5	12.5	10.0
<u>Industrialized Countries</u>										
Germany, F.R.			15870.1	59933.8	144555.2	88.7	88.9	86.7	18.1	9.2
Japan			7553.3	33619.1	137351.5	89.4	91.0	93.6	20.5	15.1
United Kingdom			11458.7	25726.2	63029.8	86.6	84.3	68.7	10.6	9.4
United States			20226.8	50482.5	148115.3	74.9	71.9	76.1	12.1	11.4
World			118976.0	379815.0	1124315.4	71.6	72.7	68.4	15.6	11.5

<sup>a</sup>Three digit international trade classification (SITC) export data were transformed via a concordance into 3 digit manufacturing industry (ISIC) data. Non-oil manufactured exports were hence defined as ISIC 311-390 excluding 353 (Petroleum) and 354 (Coal etc.). - <sup>b</sup>The ranking of the industrializing countries is determined by the value of exports in 1983. The numbers in ( ) represent the ranks in 1965 and 1973. - <sup>c</sup>Without having specific knowledge about the prices of manufactured exports, it was decided to leave the growth rates in nominal terms rather than deflating with a common world price index for manufactures. Deflating with a common price index would not influence relative size of rates of change.

and by others not including exports produced or processed in customs enclaves (i.e. Mexico)<sup>1</sup>.

- The method of ranking chosen reflects primarily the demands of this analysis, it is not contended that all relevant questions relating to exports are best represented by this approach.
- The exports for some countries had to be calculated via inversions (e.g. the People's Republic of China), i.e. by adding up the imports of partner countries<sup>2</sup>. While the data should be viewed as a rough estimate, they do seem to adequately portray trends in the period under consideration<sup>3</sup>.

These essential statistical issues having been clarified and not wanting to delve any further into the data presented in Table 2 for the moment, the analysis - using the format of Table 2 - moves on to an initial encounter with the overall impact of the industrialization policy framework on trade.

---

<sup>1</sup> Whereas the former would not necessarily influence the evaluation of performance if re-exports shares remain constant, the latter means that at least the 1983 figures underestimate the actual value of exports.

<sup>2</sup> While inversions do embody difficulties, it could be determined (by comparing inversions with data from countries where correct data already existed) that the problems were not of a nature to dismiss the information as useless.

<sup>3</sup> For certain countries the 1983 (India and Malaysia) figures were based on unofficial UN estimates. These estimates in the past have proved to be relatively reliable.



### III. Trade Performance and the Factor Intensity of Trade: Background and Measurement

Drawing on the above ranking of countries (and keeping in mind the PACRIM trade trends/performance as shown on a more disaggregated level in Table A4), the question now to be addressed concerns the overall impact of policies on trade or rather on the factor intensity of exports. That is, to what extent can it be established that the factor intensity of exports, as a reflection of industrialization policies impacting on the structure and factor intensity of production, followed a path which could be deemed to be in line with assumed comparative advantages of the individual countries.

This approach, which attempts to capture the impact of the economic policy environment on the structure or rather on the factor intensity of production and hence on the factor intensity of exports, rests on the basic principle that resources will flow into those industries where a more intensive use of those factors of production is possible, from which a greater return can be expected. To the extent that policies have been instituted to promote certain industries or rather which affect the allocation of resources flowing to these industries by reducing the prices of the factors of production most intensively used therein, then these sectors - *ceteris paribus* - account for a greater share in production/exports. Hence, referring back to Krueger's Table 7.1., which portrayed the degree to which the ratio of prices for labor/capital were affected by prevailing policies, the higher the value of this ratio the greater the tendency of a country would be to produce with higher capital intensive methods.

As far as the comparative advantage of the countries dealt with in this paper is concerned, it is generally perceived to be all the more in the area of labor-intensive goods, the lower the level of per capita income was. While over time, i.e. as the relative prices of the factors of production shift with increasingly higher levels of development, more physical/human capital-intensive lines of production will evolve, the speed

with which this process occurs, depends - *ceteris paribus* - upon the speed with which income levels grow. In order to determine the factor intensity of exports it is thus important to find an indicator which is applicable to all countries on the development ladder. In the past, most studies (see Ariff, Hill, pp. 179-181) have been based on the assumption that data from the United States on factor intensities of production - given the conditions in a large, relatively open market - can be considered as sufficiently reflecting theoretically assumed conditions and can hence be applied to other countries as well. Lary's (1968) seminal work on this topic, where US, UK, Japan and India factor intensity data are compared, is thereby used as a basis or rather vindication for proceeding with US data.

These results not withstanding, but particularly in light of the crucial nature of such an indicator which must correctly reflect the factor intensity of trade over a wide spectrum of development level, new calculations were carried out to generate an appropriate indication. This indicator, the construction of which is described in more detail in Appendix B, was designed in line with theoretical underpinnings specifying that - *ceteris paribus* - efficient development paths constitute production employing relatively more labor than physical and human capital at the early stages of development, shifting to a more extensive use of the latter two as income levels increase. Two indicators of factor intensities were used in this analysis; one refers to physical capital intensity (CAPINT) and the other to human capital intensity (HCINT).

$$(1) \text{ CAPINT}_{ij} = \frac{\text{FIXED}_{ij}}{\text{EMP}_{ij}}$$

$$(2) \text{ HCINT}_{ij} = \frac{\text{WAGES}_{ij}}{\text{EMP}_{ij}}$$

where for country *i* and industry *j*

$\text{FIXED}_{ij}$  = value of fixed assets,  
 $\text{EMP}_{ij}$  = employment and  
 $\text{WAGES}_{ij}$  = wages paid

in the given year. These two indicators (based on US 1980 data - see appendix) were then used to determine which ten 3-digit ISIC industries had the lowest and the highest values and thus belonged to those which can be classified as being definitely

- labor intensive (LI),
- physical capital intensive (PCI),
- low human capital intensive (LHCI) and
- high human capital intensive (HHCI).

Having delineated these industries, their respective shares in exports can be summed to produce the corresponding indicator.

Based on this indicator of definitely labor/capital intensive or low/high human capital intensive exports, the development of the factor intensity of exports can now be examined. That is, for each of the 4 indicators (LI, PCI, LHCI and HHCI) first export shares were aggregated for three subperiods within 1965-83 period and then their changes between the periods were calculated. The results, which are assumed to reflect the impact of the economic environment and policies therein on the allocation of resources, are presented in Tables 3 and 4.

While the conclusions which can be drawn from the tables are by no means unequivocal, there would seem to be enough evidence to support the basic hypothesis that those developing countries which tended to initially specialize in LI as opposed to PCI industries fared better in world markets. This is most clearly shown in the case of the two big losers over the 18 year period, namely Egypt (which dropped 10 ranks) and India (which dropped 8 ranks). Both of these countries exhibited noticeable drops in the share of their exports in LI industries. On the other hand, the most successful countries - i.e. Taiwan, Korea, Singapore, Thailand and Turkey - all revealed initial increases in their LI shares. Later on, those with already high LI shares showed a decrease, as the relative prices of the production factors shifted in accordance with income levels and supply conditions. Those with still low levels of LI exports (e.g.

Thailand and Indonesia) continued to expand their exports in these areas.

Switching to the human capital side of the analysis, specifically to the high human capital intensity indicator (HHCI), the predominance of such goods in the exports of ICs is quite visible (see Table 4, fourth column from right). That countries like Malaysia and Indonesia should register HHCI values comparable to IC levels, however, has less to do with the existence of extensive distortions, than with the natural resource links of ISIC 372 (non-ferrous metals basic industries)<sup>1</sup>. Aside from such outliers, the theoretical underpinnings would tend to sketch a slow growth path of HHCI, dictated - inter alia - by the rate of capital accumulation. Large increases over short periods of time are thus likely to represent shifts into areas of production for which the economy is not equipped to sustain. Within the first period (i.e. 1965-73) those countries with the largest increases in HHCI (excepting Tunisia) were also those with poor export performances. As a matter of fact over the entire time period the largest increases in HHCI - excepting Brazil - were exhibited by Egypt, Argentina and India - the top three on the losers' list.

To conclude: Generally speaking, there does seem to have been a tendency for countries which performed better in world trade to have specialized in industries, where the factor intensity of production was more in line with an efficient tapping of their development potential.

---

<sup>1</sup> See Ariff, Hill (Appendix II), where 372 is classified as a resource intensive industry.

Table 3 - Shifts<sup>a</sup> in Export Shares<sup>b</sup> in Industries with Definitely Low<sup>c</sup> (LI) or Definitely High<sup>d</sup> Physical Capital Intensities<sup>e</sup> (PCI) for Exports to World

Ranking of countries <sup>f</sup> in 1983	1965	Definitely Low Physical Capital Share				Definitely High Physical Capital Share			
		1965	1965-73	1973-78	1978-83	1965	1965-73	1973-78	1978-83
Industrializing Countries									
1. Taiwan	(12)	20.5	26.0	-2.0	-1.1	14.3	-7.1	3.7	1.7
2. Korea	(19)	37.6	8.9	-2.8	-6.6	24.8	-11.7	-0.5	3.1
3. Brazil	(3)	11.1	8.4	-4.4	-0.0	15.9	0.2	5.8	9.9
4. Singapore	(6)	20.1	5.4	2.3	1.7	28.8	-8.0	1.3	-2.2
5. Hong Kong	(4)	53.6	2.6	0.5	-0.2	9.6	-3.4	-1.2	0.1
6. China, P.R.	(2)	39.4	3.0	-0.3	1.5	20.7	-2.0	-0.2	0.1
7. Mexico	(7)	22.5	1.4	-7.5	11.9	33.1	-3.8	0.1	-1.6
8. Malaysia	(5)	3.2	2.5	8.9	11.3	44.4	-15.1	-8.1	-5.5
9. India	(1)	51.4	-2.6	-11.3	0.9	15.0	3.3	6.6	-2.9
10. Thailand	(14)	13.7	6.9	1.3	6.1	20.8	-0.6	-2.4	-3.7
11. Turkey	(16)	26.4	7.0	-1.9	-2.1	29.6	-7.6	4.8	0.7
12. Indonesia	(15)	3.8	0.6	-0.8	6.2	35.6	-1.4	-3.0	6.8
13. Argentina	(8)	15.6	4.7	5.6	-8.8	12.1	5.7	-0.5	4.3
14. Philippines	(9)	16.6	-5.0	2.4	7.7	14.3	10.8	-6.3	-4.2
15. Pakistan	(11)	80.1	-21.5	-1.8	6.5	5.1	10.4	-5.9	-0.5
16. Colombia	(13)	7.0	11.9	-6.9	-0.5	5.2	7.3	-5.4	6.7
17. Morocco	(17)	9.1	6.1	7.3	0.7	28.3	-10.8	2.6	15.4
18. Ivory Coast	(18)	4.1	3.8	-1.4	4.6	4.1	1.7	-2.0	4.8
19. Tunisia	(21)	9.5	2.1	21.5	4.7	27.9	7.3	-16.0	4.8
20. Egypt	(10)	71.1	-10.6	-10.7	4.6	10.9	4.0	8.2	-1.6
21. Kenya	(20)	17.1	-2.0	-5.7	-1.9	14.2	2.0	-0.4	2.5
Industrialized Countries and World									
Germany, F.R.		27.1	0.3	-0.5	-0.3	30.1	-1.7	-1.0	-0.4
Japan		33.1	-4.0	-0.3	-2.5	29.2	-2.0	-2.8	-3.5
United Kingdom		26.4	-1.0	-0.0	-1.3	29.1	0.4	-0.6	1.2
United States		24.0	0.8	0.4	-0.7	23.8	-2.3	-1.0	-0.3
World		25.7	0.9	0.1	0.3	28.6	-1.3	-0.9	-0.5

<sup>a</sup> Simple difference in shares between stated time periods. - <sup>b</sup> Export shares based on 28 ISIC industries between 311-390 (excluding 353 and 354). - <sup>c</sup> Consists of following ISIC industries: 321, 322, 323, 324, 331, 332, 342, 381, 382, 383, 385 and 390. - <sup>d</sup> Consists of following ISIC industries: 313, 314, 341, 351, 352, 361, 362, 369, 371 and 372. - <sup>e</sup> Capital intensities defined as capital assets/employee. 1980 capital intensity indices used. - <sup>f</sup> The ranking of the industrializing countries is determined by value manufactured exports in 1983. The number in ( ) is ranking in 1965.

Source: Own calculations based on foreign trade data from UNCTAD.

Table 4 - Shifts<sup>a</sup> in Export Shares<sup>b</sup> in Industries with Definitely Low<sup>c</sup> (LHCI) or Definitely High<sup>d</sup> Human Capital Intensities<sup>e</sup> (HHCI) for Exports to World

Ranking of countries <sup>f</sup> in 1983	1965	Definitely Low Human Capital				Definitely High Human Capital			
		Share 1965	Change in Shares			Share 1965	Change in Shares		
		1965	1965-73	1973-78	1978-83	1965	1965-73	1973-78	1978-83
Industrializing Countries									
1. Taiwan	(12)	74.2	-13.6	-7.9	-5.8	14.8	1.7	4.8	3.0
2. Korea	(19)	59.0	-4.0	-6.0	-10.8	27.4	-4.1	1.7	7.7
3. Brazil	(3)	80.3	-6.0	-18.4	-9.4	17.1	2.3	11.8	9.0
4. Singapore	(6)	42.4	-5.2	-1.4	-4.2	35.4	4.3	-1.5	3.1
5. Hong Kong	(4)	55.6	-2.1	-3.4	-3.1	19.3	-0.2	2.3	2.3
6. China, P.R.	(2)	65.5	-0.3	-4.3	-2.2	21.4	-1.2	1.7	2.3
7. Mexico	(7)	55.2	-9.0	1.0	-14.2	33.0	3.8	-1.6	3.2
8. Malaysia	(5)	18.0	20.3	1.2	-1.2	45.5	-12.7	-2.3	1.4
9. India	(1)	76.3	-16.1	-10.7	5.8	15.7	5.8	9.0	-3.1
10. Thailand	(14)	68.4	-5.9	-2.2	2.0	20.6	-0.5	-1.0	-2.6
11. Turkey	(16)	66.1	5.3	-4.0	-11.8	28.9	-7.5	1.9	4.7
12. Indonesia	(15)	40.3	4.0	5.7	-5.1	40.0	-4.5	-2.3	7.4
13. Argentina	(8)	81.1	-21.7	-0.7	0.7	14.5	10.4	-1.9	3.3
14. Philippines	(9)	85.1	-13.3	-2.0	-5.1	14.5	9.8	-3.3	-0.0
15. Pakistan	(11)	86.7	-14.8	4.1	1.5	6.5	9.7	-4.5	0.1
16. Colombia	(13)	91.4	-12.2	6.7	-6.1	5.3	8.0	-5.3	6.8
17. Morocco	(17)	67.2	8.7	-4.4	-9.5	27.9	-9.3	2.6	15.9
18. Ivory Coast	(18)	90.8	-3.2	5.0	-6.9	5.1	2.9	-2.5	5.0
19. Tunisia	(21)	66.6	-6.3	-2.3	-8.1	28.0	6.2	-9.8	6.4
20. Egypt	(10)	87.7	-7.0	-9.8	3.2	10.9	4.5	9.0	-2.2
21. Kenya	(20)	80.9	-1.7	-1.1	-0.2	12.9	1.7	0.4	1.1
Industrialized Countries and World									
Germany, F.R.		22.6	1.3	-0.7	0.1	48.1	-1.1	-0.7	1.0
Japan		34.4	-9.0	-3.7	1.0	40.9	6.1	-1.1	-1.5
United Kingdom		24.2	0.3	-0.3	-1.8	47.8	2.0	-0.1	3.6
United States		27.4	-0.8	-1.1	-2.1	46.8	2.6	-0.5	3.4
World		35.6	-2.7	-1.9	-0.8	41.8	1.3	0.0	1.3

<sup>a</sup> Simple difference in shares between stated time periods. - <sup>b</sup> Export shares based on 28 ISIC industries between 311-390 (excluding 353 and 354). - <sup>c</sup> Consists of following ISIC industries: 311/12, 321, 322, 323, 324, 331, 332, 342, 356 and 390. - <sup>d</sup> Consists of following ISIC industries: 313, 314, 341, 351, 352, 371, 372, 382, 384 and 385. - <sup>e</sup> Human capital intensities defined as wages/employee; see also Appendix II. 1980 human capital intensity indices used. - <sup>f</sup> The ranking of the industrializing countries is determined by value manufactured exports in 1983. The number in () is ranking in 1965.

#### IV. Trade Performance, the Foreign/Domestic Market Interface and the Factor Intensity of Trade: The Distortions

Without wanting to argue that the indicators chosen above have correctly and completely picked up the policy measures which influence them (this would mean ignoring exceptions) there does seem to be enough interaction between factor intensities and export performance to justify further investigation. But before moving from export markets, i.e. export performance, to domestic markets, i.e. to the policies impacting directly on the allocation of resources within a country, the next step is logically an examination of the interface between foreign and domestic markets. After all, the most efficient domestic policies will not engender success in export markets if the foreign exchange system does not operate without friction and if exchange rates do not correctly reflect the economy's position in the international division of labor.

#### The Foreign/Domestic Market Interface: Exchange Rates and Trade/Transactions Regulations

With respect to an exchange rate index (i.e. effective exchange rate changes) these calculations illustrate one particular factor influencing international competitiveness. It is thus an essential link in interpreting developments in domestic markets and comparing them with those in international markets. That is, an exchange rate which - in real terms - is allowed to appreciate by not adjusting for domestic price increases relative to other countries, will make exportables less and less competitive even if domestic factor markets have allowed relative scarcities to be reflected in relative prices. Hence performance in world trade will - ceteris paribus - be negatively influenced. This can be best exemplified by drawing on evidence from the diagram with the real effective exchange rate changes (Diagram 1, see discussion in Fischer, Spinanger, Appendix I) combined with export performance indicators (see page 9). As noted above, since changes in real exchange rates are but one factor affecting the ability to compete in world markets the following caveats should thereby be observed:

- Changes in real exchange rates only indicate a shift in the competitive position of a country in world markets and do not imply anything about the actual reaction of the country. Hence a real devaluation, which improves the competitive position, does not mean that competitive exports will be automatically forthcoming. In other words producers must react.
- Given the fact that producers must react to a change in their competitive position, it takes time before the necessary decisions are made and investments effected in order to engender the products to be exported. To the extent that production facilities and marketing channels already exist such lead-time can be quite short. If new investments need be effected, marketing channels established and other steps taken, then the time frame can encompass several years.
- In the same vein real exchange rate changes will be all the more effective in inducing shifts in production if the changes are perceived as being of long enough duration so as to reduce the risk of not receiving a fair return. In other words, widely fluctuating real exchange rates dampen the ability to predict the present value of a future stream of earnings<sup>1</sup>.
- Finally, changes in real exchange rates merely indicate size and direction of shifts in the competitive position, they do not imply that a country's exchange rate is at a level which permits exporting competitive products. This means that the changes have to enter or be within a range which would allow efficiently produced exports to be competitively priced.

Tying this information to export performance is most easily managed if additional information on distortions in the interface is known. This is presented in Table A8 which attempts to

---

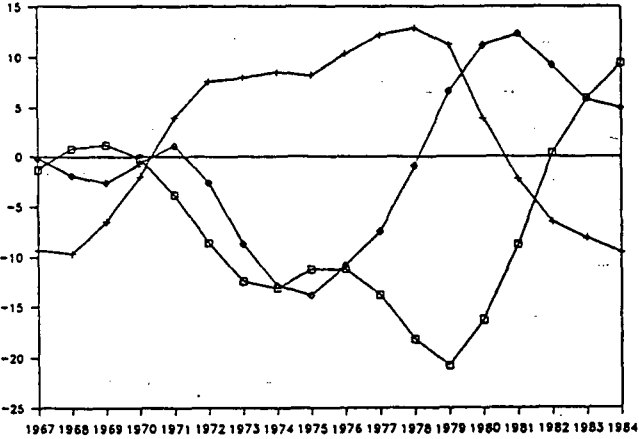
<sup>1</sup> Recent trends in oil prices portray quite well what happens if expected price increases, upon which investment decisions are based, are not realized.



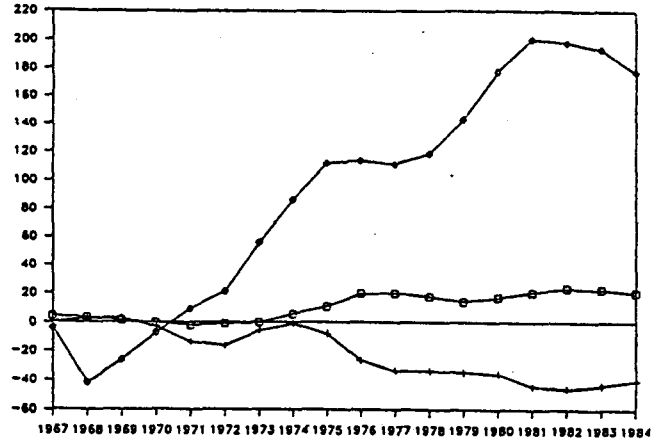
Diagram 1

Effective Real Exchange Rate Changes

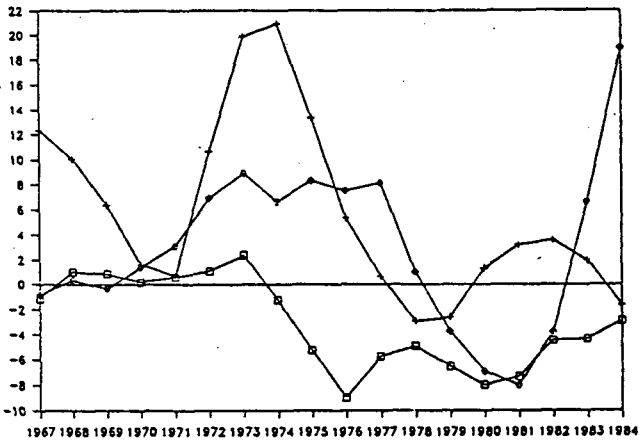
Export Price Deflated - 1970 = 100



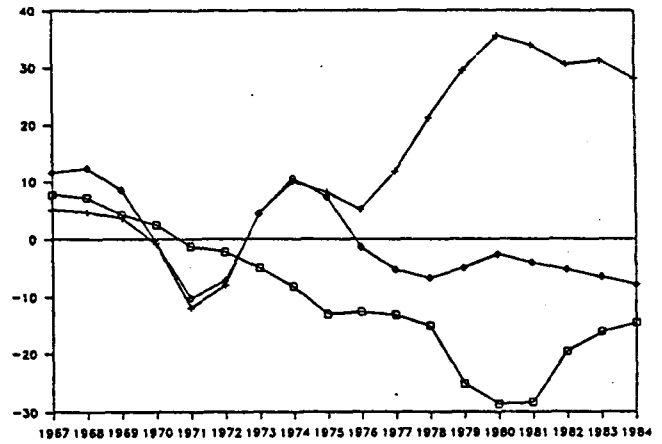
□ USA + Germany, F.R. ○ UK



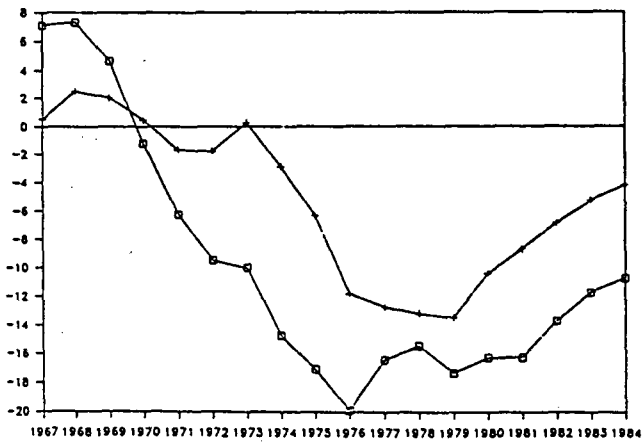
□ Singapore + Philippines ○ Indonesia



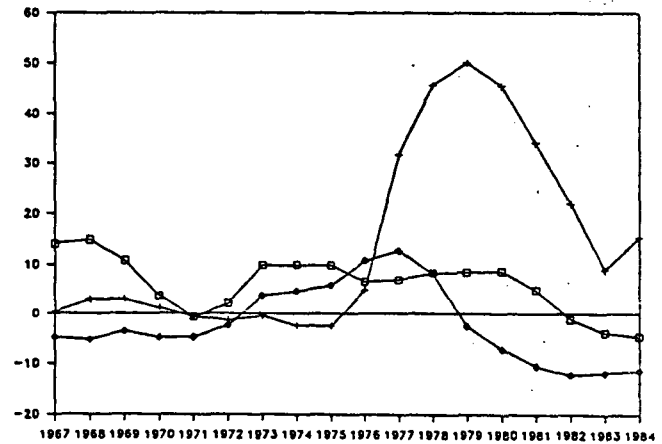
□ Japan + Australia ○ Hongkong



□ India + Malaysia ○ Thailand



□ South Korea + Taiwan



□ Turkey + Mexico ○ Brazil

cover all possible barriers to interacting between domestic and foreign markets.

While the information on distortions/barriers in Table A5 would seem to show that the more successful countries did indeed make it easier to access foreign markets (i.e. fewer dots for the top countries than the bottom countries), the diagram on effective real exchange rate changes - as noted above - is difficult to interpret with respect to performance in world trade. This is all the more so the better such an interface functions, allowing the comparative advantages of a country to be tapped, thereby driving up the exchange rate (in real terms). Japan, for instance, experienced a large real revaluation (exchange rate deflated with consumer prices) over the years, but given rapid increases in productivity in the export sector and restructuring, it has been able to cope with such a trend (see Diagram 1 where exchange rates were deflated with export prices)<sup>1</sup>.

#### Distortions in Domestic Labor Markets

Within domestic markets the policies impacting on the relative prices of labor and capital are far too numerous to be dealt with in detail here. In the case of labor these cover all measures which change the price in a manner which influences the demand for and/or supply of labor. Basically speaking, in market economies the remuneration of labor is supposed to represent the pecuniary counterpart of labor services offered. Although technically this still holds true, the remuneration received directly by the person performing the services has become an increasingly smaller share of total remuneration directly and indirectly attributable to the employment of an individual. Thus in discussing the implications of changes in

---

<sup>1</sup> Indonesia, Malaysia and Mexico are obviously influenced by different parameters, namely the oil price. The extent to which the government does not permit some sort of compensation for higher valued currencies, then exports in other sectors may well suffer from the Dutch disease.

relative prices between labor and capital it is quite essential to use terms which cover the entire spectrum of costs generated. Labor costs therefore include as a main component wages, but also non-wage costs dictated by government regulations, agreements with unions, company policies and societal traditions. The non-wage costs cover such items (e.g. social security payments) which employees can see is being paid for them and from which they assume they will receive benefits at some future point in time. Included as well are those expenditures required to allow a person to carry out a job he or she is to be paid for, these being basically such items as required by health and safety regulations enacted by the State but may also be the result of bargaining agreements with unions<sup>1</sup>.

Generally speaking the majority of the influences affecting the cost of labor have been implemented in the course of creating the modern Welfare State. They have caused the level and the structure of real wages to inadequately reflect productivity differentials between labor force cohorts and hence have made it very expensive for firms to hire labor<sup>2</sup>. In other cases they have decreased interfirm as well as interregional mobility or - in connection with other social/fiscal measures enacted by the state - have made leisure more attractive than working<sup>3</sup>.

---

<sup>1</sup> These might be as minimal as safety glasses provided by employers, but as extensive as elaborate workplace pollution control devices which protect against poisonous gases, loud noises and bright lights.

<sup>2</sup> Minimum wages, for instance, establish wage floors below which employers cannot legally pay. Thus if the value of the output (i.e. productivity) of some persons is lower than what is stipulated by minimum wages, then these persons will not be employed. For an analysis of the impact of economy-wide labor laws in a DC see Spinanger (1984 and 1986).

<sup>3</sup> Such could be the case if unemployment insurance levels were close to net earnings. If incentives did not exist to ensure that the unemployed actively sought new jobs, then paid leisure could well result.

Table 5 - Overview<sup>a</sup> of Minimum Wages, Wage Rates and Costs of Capital

Countries <sup>b</sup>	Minimum Wages <sup>c</sup>				Wage Rates <sup>d</sup>				Capital Goods' Prices Investment Deflator <sup>e</sup>		
	Base 1966	66-72	% Change 72-77	77-80	Base 1966	66-72	% Change 72-77	77-80	66-72	72-77	77-80
Industrializing Countries											
1. Taiwan (12)	-	-	-	-	-	-	162	65	12	74	23
2. Korea, R. (19)	-	-	-	-	5420M	270	265	112	81	145	93
3. Brazil (3)	81M	215	290	305	137M	320	402	335	239	297	343
4. Singapore (6)	-	-	-	-	.91H	8	63	33	28	39	22
5. Hong Kong (4)	-	-	-	-	10.16D	88	57	51	52	44	45
6. China, P.R. (2)	-	-	-	-	-	-	-	-	-	-	1
7. Mexico (7)	650M	52	180	53	5.95H	41	195	53	29	167	77
8. Malaysia (5)	-	-	-	-	-	-	-	-	10	40	36
9. India (1)	-	-	-	-	176M	42	87	23	30	61	40
10. Thailand (14)	-D	-	115	-	-	-	-	-	16	60	57
11. Turkey (16)	10.72D	59	251	-	22.66D	100	182	262	79	146	495
12. Indonesia (15)	-	-	-	-	-	-	-	-	2667	128	22
13. Argentina (8)	158M	182	44123	1455	.94H	250	3948	1222	251	10296	1075
14. Philippines (9)	6D	33	25	-	171M	61	-	53	64	113	43
15. Pakistan (11)	-	-	-	-	-	25	142	21	34	278	2
16. Colombia (13)	364M	49	190	144	4.15H	85	159	130	84	222	91
17. Morocco (17)	85H	13	22	-	.85H	13	303	40	23	63	41
18. Ivory Coast (18)	42.4H	38	97	-	-	-	-	-	27	79	28
19. Tunisia (21)	.08H	24	86	36	-	-	-	-	18	93	17
20. Egypt (10)	25D	20	33	-	3.34W	37	114	52	25	116	49
21. Kenya (20)	175M	0	100	-	516M	23	54	28	11	120	45
Industrialized Countries											
Germany, F.R.	-	-	-	-	4.42H	64	51	18	32	23	20
Japan	- D	-	71	-	40510M	131	114	22	20	61	14
United Kingdom	-	-	-	-	46.2H	77	105	58	40	119	50
United States	1.25H	28	44	35	2.72H	40	49	28	10	53	30

<sup>a</sup>This table is an attempt to combine data from various sources into one coherent table. Since definitional problems exist between countries as concerns minimum wages and wage rates, caution is necessary. - <sup>b</sup>See footnote in Table II.2 for explanation of ranking. - <sup>c</sup>The base in 1966 is in national currency units, corrected for any possible reforms. The letter following the base refers to hour (H), day (D) or month (M). - <sup>d</sup>Wage rates generally apply to manufacturing. See also footnote c. The W after base for Egypt means week. UK is in pence. - <sup>e</sup>Data taken from World Bank (1984) tables.

Source: Own calculations based on Starr (1981), World Bank (1984) and various national sources.

A summary of wage and capital cost developments is given in Table 5<sup>1</sup>. It must be remembered that labor costs need be viewed in connection with the development of capital costs. Hence, when discussing events in an inflationary world it is incorrect - at least in the context of this analysis from the production side - to discuss real wages deflated with consumer prices. The relevant price index is the one which applies to the cost of capital. This would be the price of capital goods as well as the (real) interest rate.

Aside from pointing out that minimum wage legislation is concentrated in the less successful countries, the relationship between minimum wages/wage rates on the one hand and the price of capital on the other hand illustrate policies practised in various countries. In interpreting the results, however, it is essential that information about other policies crucial to tapping comparative advantages is taken into consideration (e.g. exchange rate policies - see Table A5). Likewise information on productivity levels is also necessary to fit the trends into a picture which better reflects real developments.

That the PACRIM countries have been able to profit from their ability to keep wages in line with productivity levels (i.e. few distortions negatively influencing the demand for labor) is quite evident in connection with the expansion of offshore production facilities for the electronics industry. That is to say: PACRIM countries were among the first to realize that their comparative advantage in the manufacture of labor intensive products could be tapped all the easier if other distortions restricting the establishment of production facilities were removed. They did so by opting for free economic activity zones (FEAZs or export processing zones - EPZs), which are supposed to represent relatively undistorted enclaves in an otherwise distorted environment. That the PACRIM countries were

---

<sup>1</sup> The table is based on incomplete information for wages, which should actually be wage costs. Nonetheless it does give an overview of relative trends which would probably not be too much more different if such costs were included.

Table 6 - EPZs<sup>a</sup> and Imports of Electronics Industry Products<sup>b</sup> into OECD Countries from Selected Developing Countries, 1965-1983

	1965	1967	1969	1971	1973	1975	1977	1979	1981	1983
OECD electronics imports:										
(1) Total <sup>c</sup>	3.28	4.63	6.80	9.79	17.85	22.26	31.03	46.02	58.49	70.65
(2) From non-OECD sources <sup>c</sup>	.20	.30	.58	1.00	2.65	3.59	5.59	9.13	11.87	15.76
(3) (2) as % of (1)	6.2	6.4	8.5	10.2	14.8	16.1	18.0	19.9	20.3	22.3
(4) Source as % of (2): <sup>d</sup>										
Hong Kong	18.2	23.2	23.4	20.3	14.3	12.4	13.4	11.2	10.9	11.7
Taiwan	2.1*	8.6	15.9	19.9*	24.8	17.6	19.3	20.6	20.4	19.1
India	.9*	1.0	.6	.4	.3	.2*	.5	.3	.2	.2
Mexico	.1	1.9*	11.6	13.0	13.9	14.0	8.8	10.9	10.3	10.0
Korea, R.	.3	.9	4.0	5.4*	9.6	11.0*	15.3	15.2	12.8	14.0
Singapore	.0	.1	1.5	7.4	13.0	12.6	12.1	14.1	15.9	16.0
Malaysia	.2	.1	.1	.1	2.2*	6.7	7.5	9.8	11.0	11.1
Philippines	.0	.0	.1	.0	.3	1.0*	1.9	3.2*	5.4	5.5

<sup>a</sup>A \* designates completion of one or more EPZs or EPZ-like facilities in or around given year. - <sup>b</sup>The electronics industry is considered to be made up of the following 9 SITC groups (Rev. 1):

- 714.2 calculating and accounting machines, including electronic computers
- 714.3 statistical machines, including electronic machines
- 714.9(2) parts of office machinery
- 724.1 television broadcast receivers
- 724.2 radio broadcast receivers
- 724.9 telecommunications equipment, n.e.s.
- 729.3 thermionic, etc. valves and tubes, transistors, semiconductors, etc.
- 729.9(5) electrical condensers and parts
- 891.1 phonographs, tape and other sound recorders, etc.

<sup>c</sup>Billions of US\$. - <sup>d</sup>Ranking of sources by average values in years 1965 and 1966.

Source: Own calculations based on UNCTAD data.

successful in offering their relatively undistorted labor markets to producers of labor-intensive electronics products can be seen in Table 8, which tracks the performance of 8 DCs, thereby 6 from the PACRIM region, in exporting electronics products to OECD countries. It shows that shifts in the shares occurred in connection with the introduction of FEAZs<sup>1</sup>.

### Distortions in Domestic Capital Markets

As in the case of labor costs, the impact of factor market distortions on the demand for and supply of capital as well as the implications for export performance, can only be approached in an eclectic manner. While it is true that information on a wide spectrum of aspects - from interest rates and incentives through depreciation allowances and tax rates - is readily available, these measures are at best very rough indicators and little information exists on their actual relevance or the extent to which they applied. If this describes the general state of affairs, the situation becomes increasingly difficult when attempting to differentiate between industrialized and industrializing countries and even more so when sectoral or subsectoral disaggregations are attempted.

In making an attempt to estimate the cost of capital, a per unit output formulation is in line with the analysis carried out here (i.e. analogous to unit labor costs). The per unit costs of capital are determined by the unit price of capital and the degree of utilization of capital in the production process. Since - as mentioned above - the unit price of capital itself is influenced by a variety of factors (i.e. by exchange rates, tariff rates, financial and fiscal subsidies as well as by depreciation allowances) and these vary widely over countries and even industries within countries, relatively sound data just at a highly aggregated level is hard to come by.

---

<sup>1</sup> That other factors were involved (e.g. investment incentives) is not denied by the other, but studies have shown that these are secondary to advantages in unit labor cost.

Analogous to the discussion of labor market distortions, with respect to relative costs of employing labor and capital, there are three principal channels through which capital costs can be affected by policies in the capital market. First, the trade regime may be administered in ways that affect the relative costs of capital equipment to different users. Second, there may be interest rate subsidies and credit rationing that can affect the relative costs of labor and capital to different industries. Finally, the tax structure and special schemes for depreciation allowances can effect the relative profitability of labor-intensive and capital-intensive techniques. Although there are always market imperfections due to information costs, transaction costs and other frictions associated with the process of economic growth, direct and indirect interventions into capital markets have played a major role in developing countries in comparison to industrialized economies. The relevant question is whether there have been any significant shifts in policies in the last twenty years thus systematically influencing the price of capital and thereby factor proportions between industries and countries, particularly with respect to the PACRIM countries. Of course, only major policy measures can be identified and correlated here to judge the direction in which they might have influenced the relative use of capital and labor in export activities. In turn, this could have been a significant factor in determining international competitiveness of products produced for the world market.

Especially under import substitution regimes which prevailed in most of the developing countries up to the mid-sixties and still are working in many of these economies, a variety of mechanisms can be identified through which the foreign exchange and trade regimes affect the overall capital cost relative to labor cost and also the relative capital cost to different industries. Perhaps the most important one is the use of a different (and lower) exchange rate for imports of machinery and equipment than for other imports (see Table A5). Very often this arises in the context of currency overvaluation, when most imports are subject to high tariff rates while capital goods



imports enter on low rates of duty or even duty free. Although it may be that import substitution tends to offset the higher costs of production of those goods entailed by their comparative disadvantage it nonetheless can constitute an implicit subsidy both for capital-using industries and for the choice of capital-intensive technique.

Little empirical work has been undertaken to estimate the magnitude of capital market distortions or their influence on capital used in production in developing countries. About the only piece of relatively systematic evidence is from twelve countries covered in the National Bureau Project on Alternative Trade Strategies and Employment<sup>1</sup>.

According to these studies exchange rate overvaluation, coupled with the reluctance of policy-makers to tax imports of capital goods in a similar fashion to that of other imported goods, has been a significant factor in contributing to low capital costs under import substitution regimes; the subsidy implicit in the pricing of capital goods were estimated to be in the range of 30-40 p.c. For countries which fostered export promotion the picture is different. Undervaluation of capital goods was generally avoided by fairly realistically valued currencies.

While tax incentives for investment have evidently not played a significant role for investment decisions within developing countries (Galenson, 1984) either an overvalued exchange rate or availability of credit at below-market borrowing rates worked in the direction to induce lower capital costs and provided together with rising labor costs (resulting mostly from minimum wages and social legislation) strong incentives for use of capital-intensive production which then resulted in the above described factor intensities of exports.

---

<sup>1</sup> A synthesis and conclusions of these studies can be found in Krueger (1983).

The per unit costs of capital can also be significantly affected by the degree of capital utilization. An increase in the utilization of equipment in manufacturing in the form of longer working hours per year and per unit of equipment may result (among other factors) from better management and/or from increased weekly hours attributable to additional shift work. The decision of a firm to use shift work or otherwise to lengthen its normal operating hours of capital depends on certain microeconomic considerations as well as on certain institutional and social factors. The greater the capital intensity of production, for instance, the greater the incentive to use shift work. Running extra shifts, however, may extend increases in marginal costs, the most important of which is labor, for which premiums are ordinarily paid for work on second or third shifts. Shift work is encouraged when the price of capital is high in relation to the price of labor, and the use of it depends also on the ease with which capital can be substituted for labor in response to a decline in the relative price of capital. The PACRIM countries have been mentioned in numerous studies, particularly in connection with the textile industry complex, as the location, where high substitutability exists and capital stock is subjected to few regulated down times.

In Table 7 it is attempted to capture the macro-economic impact of influences on the price of capital, i.e. the interest rate, by looking at it in real terms. It can be expected that in those countries where the real rates of interest are low or rather negative, the tendency to use capital intensive production methods will be higher. Furthermore, in such countries the willingness to loan money (at negative real interest rates) will also be low, so that economic/export performance will be further hampered. While the picture which can be developed from Table 7 is also not unequivocal, it does reveal that those countries in the lower half of the table more often tended to have negative interest rates than those in the top half. India,

Table 7 - Real Rates of Interest<sup>a</sup> in Selected Countries, 1965-1982

Countries <sup>b</sup>	Rank in 1965	1965	1970	1973	1978	1982
<u>Industrializing Countries</u>						
1. Taiwan	(12)	10.7	5.3	-3.3	4.5	1.4 <sup>c</sup>
2. Korea, R.	(19)	2.8	4.5	8.2	0.9 <sup>d</sup>	-8.1 <sup>e</sup>
3. Brazil	(3)	-54.7	-2.5	5.4	19.6 <sup>d</sup>	20.3 <sup>d</sup>
4. Singapore	(6)	3.5	4.3	-5.1	4.3	2.4 <sup>c</sup>
5. Hong Kong	(4)	n.a.	n.a.	n.a.	n.a.	n.a.
6. China, P.R.	(2)	n.a.	n.a.	n.a.	n.a.	n.a.
7. Mexico	(7)	n.a.	n.a.	n.a.	-5.4	-51.8
8. Malaysia	(5)	4.8	3.9	-4.2	1.4	0.1 <sup>e</sup>
9. India	(1)	-4.3	0.7	-12.0	3.3	-4.6 <sup>e</sup>
10. Thailand	(14)	6.6	6.8	-8.8	-0.2	-8.4 <sup>e</sup>
11. Turkey	(16)	n.a.	n.a.	-12.8	27.6	17.2
12. Indonesia	(15)	n.a. <sup>l</sup>	11.5	-15.2	0.9	-9.5 <sup>e</sup>
13. Argentina	(8)	-24.4 <sup>l</sup>	-5.5	-45.2	-35.1	n.a.
14. Philippines	(9)	-3.0	-6.5	-6.3	4.7	-4.6 <sup>e</sup>
15. Pakistan	(11)	-2.8	0.6	-17.1	2.2	-2.4 <sup>e</sup>
16. Colombia <sup>f</sup>	(13)	4.3	-7.0	-6.8	n.a.	n.a.
17. Morocco <sup>f</sup>	(17)	-2.6 <sup>g</sup>	1.9	-0.7	1.4	5.5
18. Ivory Coast <sup>f</sup>	(18)	0.9	-5.5	n.a.	-7.5	2.1
19. Tunisia <sup>f</sup>	(21)	n.a.	n.a.	n.a.	n.a.	n.a.
20. Egypt <sup>f</sup>	(10)	n.a. <sup>h</sup>	n.a.	n.a. <sup>k</sup>	-4.5	-0.3
21. Kenya	(20)	0.6 <sup>h</sup>	2.1	-3.9 <sup>k</sup>	-7.6	-10.5
<u>Industrialized Countries</u>						
Germany, F.R.		3.9	4.9	2.3	3.1	4.6 <sup>h</sup>
Japan		2.0 <sup>c</sup>	-0.4	-4.4	2.3	5.6 <sup>h</sup>
United Kingdom		1.9	2.8	1.6	4.2	6.2 <sup>h</sup>
United States		1.9	3.6	-0.4	0.5	5.5 <sup>h</sup>

<sup>a</sup>Nominal interest rate as indicated minus yearly (actual) change of the consumer price index. - <sup>b</sup>Real rates of interest on 12-month time deposits. - <sup>c</sup>1981. - <sup>d</sup>Real rates of interest on 6-month time deposits. - <sup>e</sup>1980. - <sup>f</sup>Real rates of interest on savings deposits. - <sup>g</sup>1963. - <sup>h</sup>1983. - <sup>i</sup>Real rates of interest on 6-month time deposits. - <sup>k</sup>Real rates on yields of public bonds. - <sup>l</sup>1966.

Source: Fischer (1982); Hanson, Neal (1984); IMF (1984); Wai (1972); Agarwal, Dippl, Langhammer (1985); Fischer (1986); Various National Statistics.

as one of the largest losers (-8 ranks) had large negative interest rates; the same applies to the Philippines (-5 ranks) and Pakistan (-4 ranks). On the other hand, Taiwan (+11 ranks) and Korea (+17 ranks) were almost always positive and Brazil (+0 ranks) effected a forceful turnabout from highly negative rates in the 60's to highly positive in the early 80's. All in all, given these data plus information on the myriad of capital cost reducing policies it becomes difficult to believe that the correlation in Table 1 between export performance and distortions in capital markets is not stronger - even stronger than for labor. It must be remembered, however, that although many measures do make capital cheaper, the use of more capital-intensive methods is not necessarily an efficient approach in many of the countries in the sample. On the other hand, since countries have introduced but few measures decreasing the cost of labor, lower distortion levels here mean that labor can be more efficiently employed. This in turn can lead to more competitive position and hence to a better export performance.

#### V. Concluding Remarks

At the outset of the preceding four sections it was stated that evidence was to be yielded on the interconnection between distortions in factor markets and performance in world trade particularly with respect to the PACRIM countries. While the results presented above are not unequivocal in the sense that indisputable facts have been presented for the entire sample of countries, there was nonetheless general evidence that the PACRIM countries either had fewer distortions or (not touched here) intervened in a manner which still allowed the profit motive to prevail. Comments to this effect can also be found in Riedel's (1985) stimulating tour d'horizon through the Asian economies as well as in UNCTAD (1987, p. 47).

Maybe the most effective way of underlying this with respect to the performance the PACRIM countries in world trade is to return to Table 2 and derive from it a table of winners and

losers in world trade (i.e. a ranking of changes in the rankings of the 21 countries over the time period 1965-1983; see Table 8). Out of the winners' column it can be seen that 5 of the 7 winners are from PACRIM. Furthermore, those countries which did exceptionally well or exceptionally poor (i.e. the first four in the winners' group and the last four in the losers' group) exhibited an increase or a decrease in both periods. In other words, they were consistent (but not constant) in their performance. While Korea and Taiwan belong to the often-quoted set of top performers, Turkey and Thailand do not, but have slowly and continually moved up the ranks into positions in the middle of the group. Should the growth rate differential between these two countries and India remain the same, they will have nudged out India in the rankings in the course of 1986.

Table 8 - Winners and Losers in World Trade of Manufactures: 1965-1983

<u>Winners</u>	<u>Mid-field</u> <sup>a</sup>	<u>Losers</u>
<u>Korea</u> (+14, +3)	Brazil (-2, +2)	<u>Malaysia</u> (-5, +2)
<u>Taiwan</u> (+10, +1)	Morocco (-1, +1)	Colombia (-1, -2)
Turkey (+3, +2)	Mexico (-1, +1)	<u>China</u> (-2, -2)
<u>Thailand</u> (+2, +2)	Ivory Coast (-1, +1)	Pakistan (-5, +1)
<u>Indonesia</u> (0, +3)	<u>Hong Kong</u> (+1, -2)	<u>Philippines</u> (-2, -3)
<u>Singapore</u> (0, +2)	Kenya (-1, 0)	Argentina (-1, -4)
Tunisia (+1, +1)		India (-6, -2)
		Egypt (-7, -3)

Note: PACRIM countries have been underlined. The rankings are based on the sum of the changes within each of the two periods, i.e. 1965-1973 and 1973-1983. The numbers in ( ) represent the change for 65-73 and 73-83 respectively.

<sup>a</sup>  $\pm$  1 over entire period 1965-1983.

Source: Based on Table 2.

Among the 8 losers appear 3 PACRIM countries: the Philippines, the People's Republic of China and Malaysia. Whereas the Philippines has been struggling for years to try to effectively structure its policies and the People's Republic of China only embarked on a major shift at the beginning of the 80's, Malaysia is a country often placed otherwise among the winners. Its relatively poor performance in the initial period was only somewhat compensated for in the years following 1973. Without going into details, it should be noted that the pattern revealed for Malaysia reflects quite well the course of economic policies, as the slower growth rates in the latter part of the 1960s induced during the 70's policy-makers to shift strategies to a less inward-looking import substituting stance. The change in the framework of relative prices not only induced new investments from within, the flow of foreign direct investments also increased noticeably, particularly into labor-intensive industries manufacturing non-traditional products (as mentioned above in connection with EPZs).

For those countries in mid-field success implies maintaining roughly the same ranking. In the case of Brazil this was achieved by recovering the two ranks in the second period it had lost in the initial period; a major shift in export incentive policies (particularly for non-traditional industries, as can also be seen in Table 2) can be considered to be behind these developments. Hong Kong, on the other hand, dropped down one notch due to poorer performance in the second period, hardly due to government industrialization policies (which it did not have), but rather to reactions to the initial negotiations on Hong Kong's future.

As compared with other studies, it can be stated that the evidence presented above is based on a far wider spectrum of countries and thus can place the performance of PACRIM countries in a correct international perspective. While information gathered from individual country studies is obviously essential to understand the internal workings of industrialization policies, an understanding of the important international

implications with respect to other countries' performance in world trade - and the underlying reasons therefor - are usually lacking. In one of the most recent studies published on exports of manufactures from the PACRIM countries (Krause [1987], pp. 209-210) the answer to the question, why PACRIM LDCs have been relatively successful exporters, is given as follows:

"... first, the countries in the Pacific Basin have grown faster than other countries; second, these LDCs have had more outward-oriented economic policies than other LDCs; and third, they had a ready market for their exports in other Pacific Basin countries."

Needless to say, such generalities do not get down to the parameters in factor markets laying the foundations for successful export performance. Although this study has only scratched the surface of this subject, the indicator set up to measure the factor intensity of trade should help in further analyzing issues involved<sup>1</sup>.

Perhaps it is even fitting to end this paper with a straightforward and succinct example of how distortions in factor markets really do work their way through to export performance. One of those PACRIM countries on the winners' list, and long upheld as a prime example of how to develop quickly and efficiently with an open economy and relatively undistorted factor markets, Singapore, clearly experienced the feedback of its own policies, in particular "to go against the market". That is to say, in 1979 the Government commenced policies to raise wages faster than (average) productivity so as to squeeze out those industries with low productivity levels<sup>1</sup>. It was felt that such

---

<sup>1</sup> Likewise, the information about the relevance of using such factor intensity indicators from an IC as opposed to DC makes it easier to tap available data sources rather than having to invest in extensive information costs.

<sup>2</sup> This policy also included specific reductions in the use of foreign laborers, since they were usually employed in the highly labor-intensive industries.

Table 9 - Singapore's Unit Labor Costs<sup>a</sup> Relative to Asian Competitors and Selected Industrialized Countries

	1980	1981	1982	1983	% Change exports 84/85
Singapore	100	100	100	100	- 5.1
United Kingdom	235	204	163	132	+ 7.4
Japan	135	132	111	107	+ 3.3
United States	131	128	122	109	- 2.2
Hong Kong	119	106	123	91	+ 6.6
Taiwan	110	113	98	88	+ 0.8
South Korea	85	75	72	68	+ 3.6

<sup>a</sup>Manufacturing.

Source: Own calculations based on Far Eastern Economic Review, March 27, 1986 and GATT (unpublished).

industries should not remain in the City-State, where high-tech establishments were supposed to chart the future course of the economy.

The above policy (along with other influences) resulted in a rapid shift in relative unit labor costs to the disadvantage of Singapore (see Table 9). Having worked their way through the system the increased labor costs not only led to exports becoming less competitive, investment also fell off and GDP fell in 1985 for the first time in over 20 years<sup>1</sup>. Initial reactions have been towards providing additional incentives and reducing taxes/nonwage labor costs, thus it remains to be seen whether

<sup>1</sup> Employment in construction and manufacturing suffered a decrease of almost 20%. Together the two sectors account for about one third of total employment in Singapore.



more sweeping reforms will instill the degree of flexibility into the system which Hong Kong still possess. Or rather whether the productivity increases are forthcoming to the same degree as in the case of Korea, which was even able to increase its competitive position over time.

To summarize the above evidence on maintaining or improving a competitive position in foreign trade means underlining the importance of efficient industrialization policies, i.e. allowing labor and capital to be paid relative to their abundance in an economy. Ensuring that this can be easily effected or rather actually representing a precondition to continued success in world markets, is the flexibility of a given economic system. Particularly in light of recent major advances in technology - which could well impact on the international location of labor-intensive industries - is flexibility the key to countering quickly changing parameters. Hong Kong is an excellent example here, as entrepreneurs in the Crown Colony are already employing state-of-the-art technology in the clothing industry to remain competitive in ICs. Thus with changes now occurring more rapidly now than in the past, economies, which attempt to nail down certain wage relationships or are intent on moving in one predetermined direction without regard to relative factor endowments, will find their economic well-being suffering, as world trade flows bypass them. Thus, to come back to Arthur Lewis again, Jamaica might have become the Hong Kong of the Caribbean Basin had it paid more attention to such basic principles in the past. As no evidence has been presented that such principles will not prevail in the future, those PACRIM countries which waived from an efficient strategy in the past have every chance to make good in the coming years. And the more countries that do so, the greater the chances are that it will finally be realized that allowing economies to interact with impulses from world markets, rather than shielding them from such influences, increases competitiveness and thus the growth potential.

APPENDIX A

TABLES

Table A1 - Growth Rates<sup>a</sup> of Non-energy Exports<sup>b</sup> from Industrialized (ICs) and Developing Countries<sup>c</sup> (DCs): 1965-83

	Growth Rates			
	1965-73	1973-83	1965-73	1973-83
	Industrialized to		NOPEC	
	ICs			
Total non-energy	15.9	9.6	13.1	11.6
Raw materials	13.1	7.2	12.8	10.4
Food	14.2	7.6	12.8	10.3
Agric. raw materials	11.6	6.1	13.0	12.2
Minerals	11.6	6.8	15.5	14.1
Non-ferrous metals	12.9	8.9	11.3	8.2
Manufactures	17.0	10.2	13.3	11.8
Chemicals	17.2	12.6	12.8	11.8
Machinery + transport	18.3	10.7	14.1	12.2
Other manufactures	15.7	8.8	12.2	11.1
Iron & steel	13.7	5.5	16.2	8.7
Textiles	13.7	5.9	8.2	7.4
Clothing	18.0	9.3	8.5	11.1
	Developing to		NOPEC	
	ICs			
Total non-energy	12.2	11.5	10.6	14.6
Raw materials	8.3	7.2	7.7	11.0
Food	9.4	7.6	5.5	12.7
Agric. raw materials	7.6	6.3	9.1	9.2
Minerals	7.1	10.1	8.2	19.5
Non-ferrous metals	5.6	6.1	19.3	18.4
Manufactures	26.9	15.6	16.0	16.9
Chemicals	16.7	15.6	17.2	17.7
Machinery + transport	48.7	26.1	20.6	21.5
Other manufactures	30.8	19.2	13.0	18.3
Iron & steel	25.3	12.6	14.1	14.5
Textiles	16.7	8.7	12.6	12.2
Clothing	33.0	16.5	15.2	15.0

<sup>a</sup> Average annual growth rates (%)

<sup>b</sup> Excludes SITC 3.

<sup>c</sup> Includes both OPEC and Non-OPEC (NOPEC) developing countries. Deviating from the usual definition, data from the People's Republic of China as well as China, Taiwan are included.

Table A2 - Structure of Non-energy Exports<sup>b</sup> from Industrialized (ICs) and Developing Countries<sup>c</sup> (DCs): 1965-83

	Commodity Structure <sup>a</sup>					
	1965	1973	1983	1965	1973	1983
	Industrialized to			NOPEC		
	ICs					
Total non-energy	100.0	100.0	100.0	100.0	100.0	100.0
Raw materials	31.0	25.5	20.5	21.0	20.5	18.4
Food	15.8	14.1	11.7	15.1	14.8	13.0
Agric. raw materials	7.8	5.8	3.9	3.1	3.0	3.0
Minerals	3.4	2.5	2.0	.7	.8	1.0
Non-ferrous metals	3.9	3.2	3.0	2.1	1.8	1.3
Manufactures	67.9	73.5	78.0	77.2	78.1	79.5
Chemicals	7.8	8.6	11.3	11.9	11.7	11.8
Machinery + transport	29.8	35.1	38.9	38.8	41.6	43.7
Other manufactures	30.2	29.9	27.8	26.5	24.9	24.1
Iron & steel	6.2	5.5	3.7	6.2	7.8	5.9
Textiles	5.1	4.4	3.1	5.5	4.1	2.8
Clothing	1.8	2.1	2.0	1.1	.8	.7
	Developing to			NOPEC		
	ICs					
Total non-energy	100.0	100.0	100.0	100.0	100.0	100.0
Raw materials	87.1	65.6	42.5	41.1	55.2	37.9
Food	45.9	37.5	25.0	41.1	28.1	22.8
Agric. raw materials	18.9	13.6	6.7	22.4	20.0	9.1
Minerals	10.4	7.2	6.0	2.4	2.0	2.7
Non-ferrous metals	11.4	7.4	4.8	2.7	4.9	3.3
Manufactures	12.5	33.5	55.2	30.2	43.9	58.7
Chemicals	1.4	2.0	2.8	4.3	6.8	8.4
Machinery + transport	.7	6.3	18.7	5.7	11.4	19.9
Other manufactures	10.4	25.2	33.7	20.2	25.8	30.3
Iron & steel	.3	1.1	2.2	2.0	2.4	3.8
Textiles	3.7	5.1	3.9	8.7	10.0	8.4
Clothing	1.9	7.3	10.5	1.6	2.2	2.5

<sup>a</sup>Commodity structure of the exports from IC or DC to IC or NOPEC in %; column sum of commodities (i.e. raw materials + manufactures) does not add to 100% due to missing items.

Source: Based on UNCTAD data.

Table A3 - Growth Rates<sup>a</sup> of Exports, GDP as well as Industrial Production and Distortion Levels for Labor Markets, Capital Markets as well as Exchange Rates: Selected LDCs in the 1970's

	Growth rates			Distortions levels <sup>b</sup>		
	Exports <sup>a</sup>	GDP <sup>a</sup>	Industrial production <sup>a</sup>	Labor markets	Capital markets	Exchange rates
Ghana	-8.4	-0.1	-1.2	H	H	H
Tanzania	-7.3	4.9	1.9	H	H	L
Jamaica	6.8	-1.1	-3.5	H	H	M
Sri Lanka	-2.4	4.1	4.0	H	M	L
Bangladesh	-1.9	3.9	9.5	H	H	L
Ethiopia	-1.7	2.0	1.4	L	L	M
Bolivia	-1.6	4.8	4.3	L	H	H
Kenya	-1.0	6.5	10.2	M	M	L
Egypt	-0.7	7.4	6.8	H	M	L
Pakistan	1.2	4.7	5.2	H	M	M
Senegal	1.2	2.5	3.7	M	M	M
Turkey	1.7	5.9	6.6	M	H	L
Colombia	1.9	5.9	4.9	L	M	L
Cameroon	2.5	5.6	8.6	M	M	L
Nigeria	2.6	6.5	8.1	M	H	H
India	3.7	3.6	4.5	M	M	L
Yugoslavia	3.9	5.8	7.1	L	H	M
Peru	3.9	3.0	3.7	M	H	L
Ivory Coast	4.6	6.7	10.5	H	M	L
Uruguay	4.8	3.5	5.2	L	H	H
Tunisia	4.8	7.5	9.0	L	M	L
Malawi	5.7	6.3	7.0	L	M	L
<u>Philippines</u>	7.0	6.3	8.7	L	M	L
<u>Malaysia</u>	7.4	7.8	9.7	M	M	L
Brazil	7.5	8.4	9.3	L	H	L
<u>Indonesia</u>	8.7	7.6	11.1	L	M	M
Argentina	9.3	2.2	1.8	L	H	H
Chile	10.9	2.4	0.2	H	H	H
<u>Thailand</u>	11.8	7.2	10.0	L	L	L
Mexico	13.4	5.2	6.6	M	H	L
<u>Korea</u>	23.0	9.5	15.4	L	M	L

Note: ranked according to export growth rates. PACRIM countries are underlined.

<sup>a</sup>Real growth rates (%), per annum basis. - <sup>b</sup>Distortion levels: H = high; M = medium; L = low.

Table A4: - Overview<sup>a</sup> of Important Exchange Rate, Trade and Transaction Regulations/Restrictions: 1965-1984

Regulation/ Restriction	Special Rates for Capital/Invisibles					Import Rate Differ- ent from Export					More than One Rate for										Restrictions on Transactions:										Import Surcharges					Advance Import Deposits					Surrender of Export Receipts									
											Imports					Exports					Current					Capital																								
	Year	65	70	75	80	84	65	70	75	80	84	65	70	75	80	84	65	70	75	80	84	65	70	75	80	84	65	70	75	80	84	65	70	75	80	84	65	70	75	80	84	65	70	75	80	84				
Countries <sup>b</sup>	Industrializing Countries																																																	
1. Taiwan (12)																					•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
2. Korea, R. (19)																										•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
3. Brazil (3)	•	•	•	•	•	•	•	•	•	•	•		•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
4. Singapore (6)																																																		
5. Hong Kong (4)	•					•					•					•																																		
6. China, P.R. (2)																										•	•	•	•	•																				
7. Mexico (7)					•					•					•					•																														
8. Malaysia (5)																																																		
9. India (1)																										•	•	•	•	•	•	•	•	•	•															
10. Thailand (14)																																																		
11. Turkey (16)	•			•		•	•	•			•		•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
12. Indonesia (15)	•					•	•				•					•	•				•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
13. Argentina (8)	•	•				•	•	•	•		•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
14. Philippines (9)																																																		
15. Pakistan (11)	•	•				•	•				•	•				•	•				•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
16. Colombia (13)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
17. Morocco (17)				•	•																																													
18. Ivory Coast (18)																																																		
19. Tunisia (21)																																																		
20. Egypt (10)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
21. Kenya (20)																																																		
	Industrialized Countries																																																	
Germany, F.R.																																																		
Japan																										•																				•	•			
United Kingdom	•	•	•																							•	•																							
United States																																																		

<sup>a</sup>A dot, i.e. a • - indicates presence of regulation/restriction in given year. - <sup>b</sup>The ranking of the industrializing countries is determined by value of manufactured exports in 1983. The number in ( ) is the ranking in 1965.

A P P E N D I X B

Constructing a New Indicator of the Factor Intensity of Trade:  
Background and Approach

Constructing a New Indicator of the Factor Intensity of Trade:  
Background and Approach

In order to construct an indicator of the factor intensity of trade, applicable to all countries on the development ladder, most studies (see Ariff, Hill, pp. 179-181) have drawn on US data on factor intensities of production, assuming that in the US a relatively open market prevailed and thus the conditions were considered as sufficient to satisfy theoretical demands. Lary's (1968) seminal work on this topic, where US, UK, Japan and India factor intensity data are compared, is used as a basis or rather vindication for proceeding with US data.

Wanting to make sure that the results in this paper are not (possibly) distorted by calculations based on data which are over a quarter of a century old, new calculations were carried out. These were based on the factor intensities of 3-digit ISIC industries for 5 PACRIM countries as well as the United States, drawn from census (or survey) data from around 1970 and 1980<sup>1</sup>. Statistics from two years for each country were specifically used, so as to also be able to determine whether indicators change significantly over time, that is, lose their ability to capture developments in factor intensities over time, as might be possible in the case of Lary's calculations.

In line with theoretical underpinnings specifying that - *ceteris paribus* - efficient development paths constitute production employing relatively more labor than physical and human capital at the early stages of development, shifting to a more extensive use of the latter two as income levels increase, two indicators of factor intensities were used in this analysis; one refers to physical capital intensity (CAPINT) and the other to human capital intensity (HCINT).

---

<sup>1</sup> Data were taken from the following years: USA - 1968 and 1980; Korea - 1973 and 1983; Malaysia - 1973 and 1981; the Philippines - 1972 and 1977; Singapore - 1970 and 1980; Taiwan - 1971 and 1981.



$$(1) \text{ CAPINT}_{ij} = \frac{\text{FIXED}_{ij}}{\text{EMP}_{ij}}$$

$$(2) \text{ HCINT}_{ij} = \frac{\text{WAGES}_{ij}}{\text{EMP}_{ij}}$$

where for country  $i$  and industry  $j$

$\text{FIXED}_{ij}$  = value of fixed assets,

$\text{EMP}_{ij}$  = employment and

$\text{WAGES}_{ij}$  = wages paid

in the given year. A ranking of the 3-digit industries by the indicators then provides an entire spectrum of factor intensities. Thereby, in the case of CAPINT, the lowest values would represent highly labor intensive industries and, analogously, the highest values extremely capital intensive industries. In traditional studies the indicators of factor intensities for each and every industry (either in value terms or as an index number) are then weighted with foreign trade and/or production shares to draw conclusion about the factor intensity of trade and/or production.

The approach used in this paper differs somewhat from the above and follows more along the lines of Ariff, Hill (1985, chapter 5). It is furthermore based upon the realization that there are industries whose specific delineation, e.g. as being labor or capital intensive, is quite difficult. It was thus decided to embody in an indicator reflecting factor intensities only those industries whose factor intensities could be specified, e.g. being definitely labor intensive. In reality this was effected by integrating the top or bottom ten industries into an indicator. CAPINT, for example, when incorporating the lowest ten values, becomes an indicator of definitely labor intensive industries. When incorporating the highest ten values, the indicator represents definitely physical capital intensive industries. The same reasoning applies to HCINT.

Based on the data from five PACRIM countries plus the United States (from around 1970 and 1980) those ten 3-digit ISIC industries were determined for each country - using the above method of calculation - which belonged to definitely

- labor intensive (LI)
- physical capital intensive (PCI)
- low human capital intensive (LHCI) and
- high human capital intensive (HHCI).

An overview of these industries for the six countries can be found in Tables B1 to B4. It becomes evident from them that over time, the composition of the individual sets changes little. For instance, out of the 10 LI industries in the six countries around 1970, 7-9 were still part of this group around 1980. Similar results can be found for the other sets.

Of more fundamental importance is the evidence on the degree to which factor intensity indicators based on data from a given country, i.e. usually the United States, can be applied to other countries regardless of development level differences. This evidence, gained by contrasting the US with the other countries in the sample, is distilled out of Tables B1-B4. It shows (in Table B5a) that only slightly more than half the industries of a US sample coincide on average with the industries in a sample from one of the PACRIM countries. It should be noted that the labor/physical capital intensity indicators are in greater agreement than the human capital intensity indicators. Important differences (i.e. as far as exports are concerned) between the US and the other countries can be seen particularly in the case of textiles (factor reversal!) but also in food manufacturing.

All this evidence could be interpreted as pointing to the fact that factor intensity indicators taken from an industrialized country, even if it can be considered to be relatively open, are not relevant for developing countries. In order to attempt

to substantiate this proposition evidence on Singapore, being a relatively undistorted economy, and Taiwan, having a broader industrial structure, were distilled out of Tables B1-B4. The results (see Tables B5b and B5c) do not substantiate the above suspected irrelevance of IC indicators for DCs. As a matter of fact, generally speaking, there would seem to be but little difference, as an indicator based on the data of any one of the countries would be as incomplete as a numeraire as one based on data from another country. This being the case, there would seem to be only one pressing reason to reject the numeraire based on US data, namely to use indicators of indigeneous factor intensities. Since such data exist for only a select number of countries, this suggestion can hardly be considered relevant when dealing with a larger sample of countries. Thus for the lack of a well-founded reason to switch to data from another country, factor intensity indicators based on US data will continue to be applied<sup>1</sup>.

---

<sup>1</sup> Indices based on factor intensities from the other PACRIM countries have also been calculated and analysed, but cannot be included in this paper due to space constraints. The main differences they reveal are in the levels rather than in the trend.

Table B1. - Classification of Definitely Labour Intensive Industries (LI) in Years around 1970 and 1980

	LI 70 and 80						LI 70 and NLI <sup>a</sup> 80						NLI <sup>a</sup> 70 and LI80					
	US	ML	TA	SI	KO	PH	US	ML	TA	SI	KO	PH	US	ML	TA	SI	KO	PH
311/																		
312 Food Manufacturing																		
313 Beverage Industries																		
314 Tobacco Manufactures						+					+							
321 Textile Manufactures	+																	
322 Clothing	+	+	+	+	+	+												
323 Leather Prods. Ex Footwear	+	+	+	+	+	+												
324 Footwear	+	+	+	+	+	+												
331 Wood, Cork Prods.																		
332 Furniture, Fixtures	+	+	+	+		+												+
341 Paper, Paper Prods.					+													
342 Printing, Publishing etc.	+			+						+								+
351 Industrial Chemicals																		
352 Other Chemical Prods.											+							
355 Rubber Prods.					+													
356 Plastic Prods. N.E.S.				+				+			+						+	
361 Pottery, China, Earthenware				+								+						+
362 Glass, Glass Prods.																		
369 Nonmetal Mineral Prods.																		
371 Basic Iron, Steel Inds.																		
372 Nonferrous Metal Inds.												+						
380 Cutlery, Tools, Hardware		+											+		+			
381 Metal Prods. Ex Machinery		+	+									+						+
382 Machinery Ex Electrical										+	+			+				+
383 Elect. Machinery, Supplies	+	+		+	+													+
384 Transport Equipment							+					+					+	
385 Precision, Optical Equip.	+				+	+					+			+	+			
390 Other Manufactures	+	+	+	+	+	+												
Total	9	8	8	8	7	7	1	2	2	2	3	3	1	2	2	2	3	3

<sup>a</sup>NLI = Not LI

Table B2 - Classification of Definitely Physical Capital Intensive Industries (PCI) in Years around 1970 and 1980

	PCI 70 and 80						PCI 70 and NPCI <sup>a</sup> 80						NPCI <sup>a</sup> 70 PCI 80					
	US	ML	TA	SI	KO	PH	US	ML	TA	SI	KO	PH	US	ML	TA	SI	KO	PH
311/																		
312 Food Manufacturing		+	+	+	+	+	+											
313 Beverage Industries	+	+		+											+		+	
314 Tobacco Manufactures				+	+	+							+					
321 Textile Manufactures						+	+	+	+	+								
322 Clothing																		
323 Leather Prods. Ex Footwear																		
324 Footwear																		
331 Wood, Cork Prods.																		
332 Furniture, Fixtures																		
341 Paper, Paper Prods.	+				+	+	+								+			
342 Printing, Publishing etc.																		
351 Industrial Chemicals	+	+	+	+	+	+												
352 Other Chemical Prods.	+	+		+								+			+			
355 Rubber Prods.							+		+	+		+		+				
356 Plastic Prods. N.E.S.												+						
361 Pottery, China, Earthenware											+		+			+		+
362 Glass, Glass Prods.	+	+				+			+									+
369 Nonmetal Mineral Prods.	+	+	+	+	+	+												
371 Basic Iron, Steel Inds.	+	+	+	+	+	+												
372 Nonferrous Metal Inds.	+	+	+		+													+
380 Cutlery, Tools, Hardware																		
381 Metal Prods. Ex Machinery																		
382 Machinery Ex Electrical																+		
383 Elect. Machinery, Supplies																		
384 Transport Equipment				+	+					+			+					+
385 Precision, Optical Equip.																+		
390 Other Manufactures																		
Total	8	8	7	7	8	7	2	2	3	3	2	3	2	2	3	3	2	3

<sup>a</sup>NPCI = Not PCI

Table B3 - Classification of Definitely Low Human Capital Intensive (LHCI) Industries in Years around 1970 and 1980

	LHCI 70 and 80						LHCI 70 NLHCI <sup>a</sup> 80						NLHCI <sup>a</sup> 70 and LHCI 80					
	US	ML	TA	SI	KO	PH	US	ML	TA	SI	KO	PH	US	ML	TA	SI	KO	PH
311/																		
312 Food Manufacturing											+	+	+					
313 Beverage Industries																		
314 Tobacco Manufactures							+						+					
321 Textile Manufactures	+			+	+	+	+	+										
322 Clothing	+	+	+	+	+	+												
323 Leather Prods. Ex Footwear	+	+	+	+		+												+
324 Footwear	+	+		+	+	+			+									
331 Wood, Cork Prods.	+		+													+	+	+
332 Furniture, Fixtures	+		+		+	+							+		+			
341 Paper, Paper Prods.		+		+														
342 Printing, Publishing etc.													+		+			
351 Industrial Chemicals																		
352 Other Chemical Prods.																		
355 Rubber Prods.						+												
356 Plastic Prods. N.E.S.	+	+	+	+							+							+
361 Pottery, China, Earthenware				+	+		+			+	+		+					
362 Glass, Glass Prods.																		
369 Nonmetal Mineral Prods.												+						
371 Basic Iron, Steel Inds.																		
372 Nonferrous Metal Inds.																		
380 Cutlery, Tools, Hardware		+																
381 Metal Prods. Ex Machinery				+		+					+							
382 Machinery Ex Electrical																		
383 Elect. Machinery, Supplies							+		+									
384 Transport Equipment																+		+
385 Precision, Optical Equip.							+		+						+		+	
390 Other Manufactures	+	+	+	+	+	+												
Total	8	7	8	7	7	7	2	3	2	3	3	3	2	3	2	3	3	3

<sup>a</sup>NLHCI = Not LHCI

Table B4 - Classification of Definitely High Human Capital Intensive Industries (HHCI) in Years around 1970 and 1980

	HHCI 70 and 80						HHCI 70 and NHHCI <sup>a</sup> 80						NHHCI <sup>a</sup> 70 and HHCI 80					
	US	ML	TA	SI	KO	PH	US	ML	TA	SI	KO	PH	US	ML	TA	SI	KO	PH
311/																		
312 Food Manufacturing																		
313 Beverage Industries		+	+	+	+	+							+					
314 Tobacco Manufactures			+	+	+								+					
321 Textile Manufactures																		
322 Clothing																		
323 Leather Prods. Ex Footwear																		
324 Footwear																		
331 Wood, Cork Prods.								+										
332 Furniture, Fixtures																		
341 Paper, Paper Prods.	+		+			+					+							
342 Printing, Publishing etc.		+			+		+					+						
351 Industrial Chemicals	+	+	+	+	+	+												
352 Other Chemical Prods.	+	+	+	+	+	+												
355 Rubber Prods.						+	+		+	+			+					
356 Plastic Prods. N.E.S.																		
361 Pottery, China, Earthenware																+		
362 Glass, Glass Prods.		+	+			+				+	+							
369 Nonmetal Mineral Prods.				+			+											+
371 Basic Iron, Steel Inds.	+	+	+	+	+	+												
372 Nonferrous Metal Inds.	+	+	+	+	+													+
380 Cutlery, Tools, Hardware																		
381 Metal Prods. Ex Machinery																		
382 Machinery Ex Electrical	+													+	+	+		
383 Elect. Machinery, Supplies						+												
384 Transport Equipment	+	+	+		+	+				+								
385 Precision, Optical Equip.	+												+		+			
390 Other Manufactures																		
Total	8	8	9	7	8	9	2	2	1	3	2	1	2	2	1	3	2	1

<sup>a</sup>NHHCI = Not HCII

Table B5a - Factor Intensity Agreements<sup>a</sup> between US and Other Sample Countries

	ML	TA	SI	KO	PH	Average
LI 70	6	5	7	5	7	6.0
LI 80	6	6	7	5	6	6.0
PCI 70	7	5	6	5	6	5.8
PCI 80	7	4	6	5	6	5.6
LHCI 70	5	6	7	5	7	6.0
LHCI 80	5	7	6	5	6	5.8
HHCI 70	5	6	4	5	5	5.0
HHCI 80	5	6	4	5	5	5.0

Table B5b - Factor Intensity Agreements<sup>a</sup> between Singapore and Other Sample Countries

	ML	TA	USA	KO	PH	Average
LI 70	6	5	7	5	5	5.6
LI 80	6	4	7	5	5	5.4
PCI 70	7	7	6	6	5	6.2
PCI 80	6	5	6	5	4	5.0
LHCI 70	8	4	7	4	6	5.8
LHCI 80	7	4	6	5	7	6.0
HHCI 70	5	7	4	7	4	5.4
HHCI 80	5	7	4	7	4	5.4

Table B5c - Factor Intensity Agreements<sup>a</sup> between Taiwan and Other Sample Countries

	ML	SI	USA	KO	PH	Average
LI 70	6	5	5	4	5	5.0
LI 80	7	4	6	4	5	5.2
PCI 70	6	7	5	8	5	6.2
PCI 80	5	5	4	7	4	5.0
LHCI 70	5	4	6	4	5	4.8
LHCI 80	4	4	7	5	5	5.0
HHCI 70	7	7	6	7	7	6.8
HHCI 80	8	7	6	8	7	7.2

<sup>a</sup>Number of same industries (within respective indicator set of 10 industries) coinciding between country in table heading and column heading.



Bibliography

- Agarwal, J. Prasad, Martin Dippl and Rolf J. Langhammer (1985), EC Trade Policies Towards Associated Developing Countries. Barriers to Success, Kieler Studien, No. 193, Tübingen.
- Agarwala, Ramgopal (1983), Price Distortions and Growth in Developing Countries, World Bank Staff Working Papers, No. 575, Washington, D.C.
- Ariff, Mohamed and Hill, Hal (eds.) (1985), Export-Oriented Industrialisation: The Asean Experience, Sidney, pp. 179-181
- Far Eastern Economic Review (1986), March 27.
- Fischer, Bernhard (1982), Liberalisierung der Finanzmärkte in Entwicklungsländern, Kieler Studien, No. 172, Tübingen.
- , et al. (1986), Sparkapitalbildung in Entwicklungsländern: Engpässe und Reformansätze, Forschungsberichte des Bundesministeriums für wirtschaftliche Zusammenarbeit, Band 78, München.
- , and Dean Spinanger (1986), Factor Market Distortions and Export Performance - An Eclectic Review of the Evidence, Kiel Working Paper No. 269.
- Hanson, James and Graig Neal (1984), A Review of Interest Rate Policies in Selected Developing Countries. World Bank, Industry Department, Washington, D.C. (mimeo).
- Hiemenz, Ulrich and Rolf J. Langhammer (1986), Efficiency Pre-Conditions for Successful Integration of Developing Countries into the World Economy. World Employment Programme Research Working Papers No. 2, Geneva.
- IMF (various issues), Annual Report on Exchange Arrangements and Exchange Realisations, Washington, D.C.
- Kotlikoff, Laurence J. and Edward E. Leamer (1987), "Empirical Tests of Alternative Models of International Growth", in: Bradford, Colin I. and William H. Branson, Trade and Structural Change in Pacific Asia, Chicago, pp. 227-269.
- Krause, Lawrence B. (1987), "Manufactured Goods in the East and Southeast Asian Region", in: Bradford, Colin I. and William H. Branson, Trade and Structural Change in Pacific Asia, Chicago, pp. 205-225.
- Krueger, Anne O. (1977), Growth, Distortions, and Patterns of Trade Among Many Countries. Princeton, Princeton Studies in International Finance, No. 40.
- , (1983), Trade and Employment in Developing Countries, No. 3, Synthesis and Conclusions, Chicago.

Krueger, Anne O. (1984), Trade Policies in Developing Countries. In: R.W. Jones, P.B. Kenen (eds.), Handbook of International Economies, Amsterdam, pp. 555-557.

Riedel, James (1985), Economic Development in East Asia: Doing What Comes Naturally? Paper presented at the National Centre for Development Studies, Australian National University, Industrialization Workshop, September 10-12, Canberra.

Spinanger, Dean (1984), The Labor Market in Panama - An Analysis of the Employment Impact of the Labor Code, Kiel Working Paper No. 221.

--, (1986), Speaking Up About the Labor Code - A Survey of Employed and Unemployed in Panama, Kiel Working Paper No. 263.

Starr, Gerald (1981), Minimum Wage Fixing, ILO, Geneva.

UNCTAD (1980), Institutional management in Development Countries for Industrial and Export Finance with a View to Expanding and Diversifying their Exports of Manufactures and Semi-Manufactures. Report by the UNCTAD secretariat. TD/B/C2/200, New York.

--, (1987), Revitalizing Development, Growth and International Trade: Assessment and Policy Options. Report by the UNCTAD secretariat. TD/328/Add.1, Geneva.

Wai, U Tun (1972), Financial Intermediaries and National Savings in Developing Countries, New York.

World Bank (1985), World Tables, Washington, D.C.