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TRADE PATTERNS IN DEVELOPING COUNTRIES, 1964-82*

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Results are presented from a regression analysis of import and export shares of GDP, for 14 commodity and service categories in 55 developing countries over the period 1964-82. Explanatory variables include GNP per capita, population, domestic capacity utilization, the effective exchange rate, and OECD real GNP (for exports). Among other findings it is shown that countries' trade patterns are not closely related to their growth performance, and that developing countries on average run surpluses of exports over non-capital goods imports on merchandise trade. This 'current' commodity surplus is required to offset imports of capital goods and a structural deficit on factor and non-factor service trade.

1. Introduction

Carlos Diaz covered the international waterfront on behalf of the developing countries. From the whorls of geometric trade theory through clever empirical studies to the political economy of bargains with transnationals and the intricacies of debt, he was always on the scene with something recent and relevant to say. He used to talk of boyhood visits to Havana harbor and wishing to be a trader on a ship. He didn't take that route, but a better one, showing how trade and capital movements give with one hand, take with the other, and strongly affect possibilities for economic change throughout the Third World.

Carlos's judgments at midpassage about trade appear in his 1978 paper. There, he partly associated himself with an old strand of thought more appealing to development than trade specialists, noting that '...a country's participation in foreign trade ... as measured by, say, the ratio of imports to GNP, has more to do with its per capita income, population size, and natural resource endowment than with its social system or domestic income distribution. One is tempted to talk about iron coefficients' (p. 119). Characteristically, he then went on to reasons why in certain policy situations, the

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coefficients might not be so die cast after all. Nonetheless, he thought that by and large the 'patterns' analysis of Kuznets, Chenery, and others applied to trade. Whether it does or not is the question we take up here.

Countries at similar levels of income and size have long been known to share patterns of economic structure and resource allocation – this is the central message of the patterns studies.¹ Pace Carlos, however, how well this generalization applies to foreign trade has remained an open question. Largely because of lack of data, the relevant tests have not been run at a disaggregated level, especially for developing countries. More important, perhaps, is the widely held view that trade policy (and presumably observed trading behavior) *should* make a difference for country 'performance'.² If this is the case, then uniform patterns may not be observed – faster-growing countries, for example, may have different levels or composition of trade than their slower neighbors.

In this study, we examine these somewhat contrasting views, as well as other plausible explanations for trade patterns, e.g., time period, regional effects, oil importer or exporter status, level of capacity utilization, OECD growth, and countries' real effective exchange rates. Three principal questions are addressed. How do levels and composition of trade respond to the 'structural' variables per capita income and population? Are trade patterns related to the need on the part of developing countries to raise net foreign exchange resources to pay for non-substitutable imports of capital goods? How does trade respond to more policy-related variables like the real effective exchange rate and OECD growth?

In this initial attempt to examine these issues, we use the simple statistical technique of ordinary least squares regression – multiple correlation in another guise. More sophisticated analysis requires accepted, prior theory, but this is not available in the area of trade. There are clearly multiple directions of causality among trade and other variables, and the number of competing theoretical explanations for trade patterns is embarrassingly large.³ For these reasons, we rely on panel regressions and sample splits to

¹For summary statements, see Kuznets (1966) and Chenery and Syrquin (1975). Kuznets (1964) goes into more detail on trade issues and Strout (1985) presents results complementary to ours.

²Balassa (1983, 1985) presents the case with vigor.

³Of popular theories, 'old' ones like Heckscher-Ohlin focus on factor endowments and by extension the importance of natural resources and the national reserve of skills in determining trade patterns; 'middle-aged' models like the product cycle stress aspects of technology. Recent work by Amsden (1986) and Havrylyshyn (1983) has provided empirical evidence to account for differences in the direction of developing country trade while Balassa (1983) has examined the effects of policies on trade between developed and developing countries. Only the middle-aged Linder (1961) theory and newer proposals by Krugman (1980), Lancaster (1980) and others explicitly bring in market size and income-related tastes. As we will see shortly, such considerations go some way toward explaining trade patterns, especially for imports. Stewart (1982) gives a useful survey of the various trade theories.

illustrate potentially important effects. The data base pools a sample of 55 developing countries, 14 categories of goods and service trade (plus partial aggregations) for the period 1964-82. Some statistical imprecision may result from pooling time series and cross section data. Better estimation in principle could be achieved by adopting a precise specification of covariances of error terms by country, commodity, and year. But again, there is no clear theoretical guidance about how this should be done.

Specifications for import and export regressions are slightly different. The first is

$$S_{it} = \alpha_i + \beta_i \ln GNPPC_t + \gamma_i \ln POP_t + \delta \ln \left(\frac{Y}{Y^*} \right)_t + \zeta_i \ln EER_t + \varepsilon_{it}, \quad (1)$$

where

t = 1964 to 1982,

S_{it} = share of sector i imports in GDP in period t ,

$\ln GNPPC_t$ = log of real gross national product per capita in period t ,

$\ln POP_t$ = log of population in period t ,

$\ln \left(\frac{Y}{Y^*} \right)_t$ = log of capacity utilization in period t ,

$\ln EER_t$ = log of the real effective exchange rate in period t ,

ε_{it} = error term associated with the i th sector in period t .

The export regressions were based on the following equation:

$$\begin{aligned} S_{it} = & \alpha_i + \beta_i \ln GNPPC_t + \gamma_i \ln POP_t + \delta_i \ln (OECD-GDP)_t \\ & + \zeta_i \ln \left(\frac{Y}{Y^*} \right)_t + \zeta_i \ln EER_t + \varepsilon_{it}, \end{aligned} \quad (2)$$

in which S_{it} now stands for an export share of GDP and $\ln (OECD-GDP)_t$ is the log of real OECD gross domestic product at time t . The trade shares are current U.S. dollar imports or exports divided by current dollar GDP. Potential real GDP is estimated as a linear envelope of actual levels over time, and capacity utilization (Y/Y^*) is the ratio of actual to potential output.⁴

⁴Commodity trade information comes from the United Nations data base. Services trade and overall balance of payments numbers are from the International Monetary Fund. Non-factor service trade was calculated as a residual to bring these two sets of data into consistency. It includes errors due to the CIF to FOB conversion (IMF imports are given FOB), timing and residual discrepancies. GDP, GNP, and population data are from the World Bank, and real OECD GDP from the *OECD Economic Outlook* no. 34, December, 1983. Constant dollar data are from 1974, except the real effective exchange rate, which is 1976-78 based. Real effective exchange rates are import and exported weighted, and were calculated for all countries but Mali which had insufficient data.

The commodity and service trade categories for which these equations were estimated appear in table 1. Categories 1 through 4 are referred to jointly in what follows as primary products, 5 through 10 as manufactures, 9 and 10 as capital goods, and 14 through 16 as services. Note that category 14 (non-factor services) also includes discrepancies between data from the United Nations (the source for data on merchandise trade) and the International Monetary Fund (services and total current account).

The terms in (1) and (2) for *GNPPC* and *POP* are standard in patterns studies such as Chenery and Syrquin (1975). Additional variables were included to capture specific forces affecting trade. Imports and exports are often thought to respond to capacity utilization — that variable is also a proxy for cyclical effects. The real effective exchange rate is supposed to affect all trading decisions, and OECD economy activity should stimulate developing countries' export demand. The equations are best viewed as reduced forms, but certain coefficients can be given demand or supply interpretations. The specification assures that predicted trade shares from the equations add up to predicted totals (so long as all equations are estimated for the same data set) and the partial elasticity of a trade share with respect to an

Table 1
Commodity and service groups.

Merchandise

1. Food: food and live animals, beverages, excluding cereals and cereal preparations.
2. Cereals: cereals and cereal preparations.
3. Non-food agriculture: tobacco, hides and skins, crude and synthetic rubber, lumber, pulp waste paper, and textile fibres.
4. Metals, minerals and fertilizers: crude fertilizer, minerals, and non-ferrous metals.
5. Intermediate manufactures: chemicals, and basic manufacturing.
6. Textiles and apparel: textiles, yarn fabric, clothing and footwear.
7. Automobiles: passenger motor vehicles (excluding buses), passenger motor vehicle chassis, motor vehicle parts, motorcycles and motorcycle parts, and motorized invalid carriages.
8. Other consumer goods: medical products, cosmetics, cleaning products, electrical and electronic appliances and other miscellaneous manufactured goods.
9. Transport equipment: buses, railway wagons and equipment, boats, ships, aircraft, and associated parts.
10. Electrical and mechanical goods: metal tanks, boxes, industrial equipment, central heating equipment, medical instruments, meters, counters, and other measuring equipment.
11. Oil and other fuels: mineral fuels, etc.
12. Non-oil total: sum of 1 to 10 above.
13. Total merchandise: sum of 1 to 11 above.

Services

14. Non-factor services: freight, insurance, carriage insurance, passenger, tourism and other travel.
15. Factor income: investment income and workers' remittances.
16. Unrequited transfers: private and official transfers.
17. Total services: total of 14 and 15 above.
18. Grand total: total of merchandise, service sectors and transfers.

explanatory variable can be computed as its regression coefficient divided by the sample mean value of the share. One plus the share elasticity with respect to per capita GDP gives an approximation to the elasticity for the level of trade.

In what follows, we discuss in section 2 the results from estimating (1) and (2) for the full sample. Thereafter, sections 3 through 7 take up five splits of the sample, used to illustrate differentials in trade patterns over time and place. The splits are:

- (1) Time period. Three periods – 1964–73, 1974–77, and 1978–82 – are separated. These correspond to before and after the first oil shock and after the second shock.
- (2) 'Performance'. There is a positive correlation between the rate of GDP growth of sample countries and their level of per capita GNP. Those lying above the regression line of growth on level of GNP per capita are classified as 'high' performers and those below the line as 'low'. Trade patterns are examined for these two groups as well as a further split by per capita GDP level (above and below \$1,000 in 1982).
- (3) Oil exporting vs. importing countries.
- (4) Population size. Two divisions by countries with populations above and below 20 million in 1981.
- (5) Region. The sample is split into four groups by region – Latin America and the Caribbean, sub-Saharan Africa, Europe, Middle East and North Africa, and the rest of Asia.

The detailed classification for each split appears in the appendix. Conclusions are presented in section 8.

2. Results from the pooled sample

Results from the pooled regressions for import and export shares appear in table 2. Three general observations should be made about goodness of fit. First, most coefficients are well-determined with high *t*-values. The right-hand side variables are all significant determinants of trade. Secondly, values of R^2 – the usual measure of precision in regression – cluster in the range 0.1 and 0.4. These numbers simply mean that trade *shares* vary over a certain range across countries. Regressions for trade *levels* would give higher R^2 values, but we thought it more illuminating to concentrate on the share results. Thirdly, standard errors of the regressions typically are between 50 and 100 percent of the relevant mean shares. According to this measure of goodness of fit, most countries' predicted shares lie within a band of width ± 100 percent of the mean around the regression line. Great dispersion in trade patterns is not observed; in a broad sense Diaz-Alejandro's iron coefficients apply.

Table 2

Sector	Mean % GDP	Constant (t)	ln GNPPC (t)	ln POP (t)	ln (Y_i/Y^*) (t)	ln EER (t)	RSQ	F	SE
<i>Least squares estimates of import trade for the pooled sample</i>									
M1 Food	2.11	2.19 (2.37)	-0.00 (-0.07)	-0.59 (-15.11)	-1.99 (-4.03)	0.26 (1.37)	0.234	71.19	1.52
M2 Cereal	1.26	4.72 (6.39)	-0.19 (-4.18)	-0.15 (-4.91)	-1.65 (-4.19)	-0.45 (-2.93)	0.068	16.93	1.22
M3 Nfoodagr	0.82	-0.93 (-2.11)	0.14 (5.13)	0.01 (0.31)	-0.27 (-1.14)	0.19 (2.09)	0.037	8.94	0.72
M4 Rawmat	0.34	-0.97 (-5.30)	0.12 (10.94)	0.07 (9.14)	0.20 (2.10)	0.09 (2.29)	0.176	49.52	0.30
M5 Intermed	4.61	1.04 (0.82)	0.07 (0.85)	-0.97 (-18.35)	0.32 (0.47)	1.22 (4.62)	0.296	97.76	2.07
M6 Textiles	1.52	5.29 (8.82)	-0.48 (-12.78)	-0.66 (-26.35)	-1.22 (-3.81)	0.14 (1.14)	0.479	213.88	0.99
M7 Autos	0.89	0.36 (1.09)	-0.01 (-0.33)	-0.22 (-16.24)	0.43 (2.48)	0.25 (3.72)	0.247	71.81	0.53
M8 Consumer	2.13	2.20 (3.31)	-0.11 (-2.75)	-0.80 (-28.92)	-0.02 (-0.06)	0.56 (4.05)	0.491	224.67	1.09
M9 Transport	1.36	-0.02 (-0.02)	-0.11 (-2.54)	-0.30 (-10.60)	0.49 (1.36)	0.61 (4.37)	0.130	34.64	1.10
M10 Elecmech	4.06	-2.11 (-1.82)	0.33 (4.62)	-0.56 (-11.52)	2.59 (4.21)	1.25 (5.17)	0.185	52.69	1.90
M11 Oil	2.93	-11.04 (-4.42)	0.98 (6.28)	-0.72 (-6.91)	-3.46 (-2.60)	2.10 (4.03)	0.136	55.32	4.10
M12 Noiltot	19.04	11.64 (2.35)	-0.22 (-0.72)	-4.15 (-20.01)	-1.06 (-0.40)	4.11 (3.98)	0.325	112.21	8.14
M13 Totmerch	21.97	0.59 (0.10)	0.75 (1.96)	-4.88 (-18.84)	-4.52 (-1.37)	6.21 (4.82)	0.321	109.82	10.15

<i>M14</i>	NFS	5.35	-1.91 (-0.46)	-1.65 (-7.97)	-1.75 (-12.37)	-3.13 (-1.82)	4.74 (5.32)	0.292	66.00	4.54
<i>M15</i>	Facinc	3.25	-3.18 (-1.67)	0.21 (2.17)	-0.59 (-8.99)	-1.33 (-1.66)	1.44 (3.47)	0.176	34.17	2.11
<i>M16</i>	Transfer	0.96	-0.29 (-0.24)	-0.57 (-9.37)	-0.40 (-9.78)	-0.10 (-0.21)	1.26 (4.85)	0.242	51.08	1.32
<i>M17</i>	Totservs	9.56	-5.38 (-0.95)	-2.01 (-7.04)	-2.75 (-14.09)	-4.56 (-1.92)	7.43 (6.07)	0.332	79.50	6.25
<i>M18</i>	Grandtot	31.58	6.63 (0.57)	-2.17 (-3.68)	-7.57 (-18.79)	-11.55 (-2.36)	12.35 (4.88)	0.421	116.52	12.91

Sector	Mean % GDP	Constant (t)	ln GNPPC (t)	ln POP (t)	ln OECD-GDP (t)	ln(Y/Y*) (t)	ln EER (t)	RSQ	F	SE	
<i>Least squares estimates of export trade for the pooled sample</i>											
<i>X1</i>	Food	6.16	-6.22 (-0.34)	-1.35 (-7.91)	-1.93 (-16.68)	1.22 (1.38)	6.92 (4.71)	-0.22 (-0.36)	0.256	64.24	4.49
<i>X2</i>	Cereal	0.31	2.42 (0.75)	0.01 (0.39)	0.08 (3.95)	-0.09 (-0.55)	0.60 (2.34)	-0.10 (-0.97)	0.030	5.64	0.78
<i>X3</i>	Nfoodagr	2.56	44.57 (3.22)	-0.83 (-6.44)	-0.40 (-4.56)	(-1.67 (-2.51))	0.96 (0.87)	0.17 (0.36)	0.073	14.72	3.40
<i>X4</i>	Rawmat	2.06	-50.63 (-2.55)	0.13 (0.70)	-0.60 (-4.79)	2.91 (3.05)	-2.00 (-1.26)	-2.37 (-3.61)	0.044	8.57	4.84
<i>X5</i>	Intermed	1.35	-15.74 (-2.08)	0.31 (4.39)	-0.43 (-8.91)	0.62 (1.70)	-3.37 (-5.54)	0.53 (2.09)	0.172	38.74	1.86
<i>X6</i>	Textiles	0.89	-33.49 (-5.79)	0.17 (3.11)	0.11 (3.14)	1.47 (5.28)	-0.43 (-0.94)	0.18 (0.95)	0.069	13.82	1.42
<i>X7</i>	Autos	0.05	-0.65 (-1.30)	0.04 (9.76)	0.01 (2.59)	0.01 (0.54)	-0.26 (-6.61)	0.02 (1.31)	0.187	34.29	0.10
<i>X8</i>	Consumer	0.79	-35.24 (-6.54)	0.37 (7.39)	-0.06 (-1.79)	1.51 (5.84)	-0.86 (-1.99)	0.14 (0.78)	0.129	27.71	1.32
<i>X9</i>	Transport	0.10	-2.06 (-1.97)	0.08 (8.09)	0.02 (3.44)	0.05 (1.05)	-0.04 (-0.46)	0.10 (2.46)	0.099	18.88	0.24

Table 2 (continued)

Sector	Mean % GDP	Constant (t)	ln GNPPC (t)	ln POP (t)	ln OECD-GDP (t)	ln(Y/Y*) (t)	ln EER (t)	RSQ	F	SE
XI0 Elecmech	0.28	-12.19 (-5.51)	0.19 (9.10)	0.02 (1.44)	0.49 (4.63)	0.11 (0.59)	0.10 (1.35)	0.130	27.39	0.54
XI1 Oil	3.23	-120.18 (-3.28)	2.54 (7.52)	-0.62 (-2.72)	4.73 (2.68)	5.26 (1.83)	1.26 (1.01)	0.092	18.11	8.64
XI2 Noiltot	14.49	-108.45 (-3.44)	-0.84 (-2.85)	-3.16 (-15.84)	6.50 (4.28)	1.67 (0.66)	-1.53 (-1.46)	0.219	52.41	7.74
XI3 Totmerch	17.64	-251.61 (-6.28)	1.59 (4.30)	-3.84 (-15.43)	12.27 (6.37)	7.41 (2.36)	-0.05 (-0.04)	0.268	65.16	9.44
XI4 NFS	4.74	-77.20 (-3.06)	-0.39 (-2.15)	-1.53 (-12.46)	3.34 (2.77)	-0.85 (-0.59)	3.21 (3.93)	0.244	43.27	3.99
XI5 Facinc	1.58	-3.68 (-0.31)	-0.14 (-1.59)	-0.65 (-11.12)	0.36 (0.62)	-3.50 (-5.08)	-0.09 (-0.24)	0.219	37.45	1.90
XI6 Transfer	4.26	-145.25 (-3.20)	-2.05 (-6.31)	-1.45 (-6.57)	6.81 (3.14)	-0.56 (-0.21)	3.47 (2.37)	0.130	19.96	7.18
XI7 Totservs	10.58	-226.13 (-3.31)	-2.57 (-5.26)	-3.62 (-10.90)	10.51 (3.21)	-4.91 (-1.25)	6.58 (2.98)	0.215	36.64	10.83
XI8 Grandtot	27.31	505.49 (-6.80)	-2.22 (-4.17)	-6.87 (-19.04)	24.22 (6.81)	-2.22 (-0.52)	6.66 (2.77)	0.416	95.40	11.77

Some trade categories show more uniformity across countries than others. Among the imports, groups of products close to the consumer (textiles and other consumer goods) have the best explained shares. Equations for goods traded among producers (cereals, non-food agriculture, and capital goods) are less precise. Intermediate manufactures occupy a position in the middle of this scale. The results suggest that aside from obvious target sectors for substitution, a country's import patterns are likely to be affected by its history of industrial growth and the particular structure of its interindustry relationships.

Among exports, the best-fitting equations are for food agriculture, intermediates, automobiles, consumer and capital goods, and non-factor services. One can hypothesize that both resource availabilities and characteristics of partner countries will influence export patterns, and these variables are excluded from the analysis. The usual patterns-of-growth assumptions that uniform evolution of tastes and technology explain structural shifts as the economy develops apply more directly to imports. Table 2 suggests that the share elasticity of cereal trade falls with output per capita while that of non-food agriculture rises, confirming the declining importance of staples as income rises. By contrast, the share elasticity is strongly positive for the electromechanicals category.

Now we take up the roles of the explanatory variables in affecting trade, beginning with per capita GNP and population. The first point to observe is that shares of merchandise trade rise with countries' real incomes. However, the shares of non-oil merchandise and service trade (both imports and exports) decline. Among the commodity categories on the import side, capital goods (groups 9 and 10) have a large and generally increasing share. Shares of the primary products are stable, with food products going down slightly and non-food up. The major sectors for import substitution are textiles and non-factor services; on the other hand factor income payments to the rest of the world rise with per capita GNP. Among exports, shares of both food and non-food agriculture decline with per capita income - this is a classic pattern. In parallel fashion, shares of manufactured products go up. There is a sharp reduction in receipts from transfers as per capita GNP is higher.

The negative responses of service and non-oil merchandise trade are strong enough to make total import and export shares drop as countries grow richer. When population is used as a proxy for 'market size', it appears that in the recent period trade expansion (including services) has not substantially outpaced income growth in the Third World.⁵

⁵An alternative correction for market size is total GNP. In that specification, coefficients for per capita GNP would equal the difference between the coefficients on $\ln GNPPC$ and $\ln POP$ in table 2. On this correction trade shares do rise with income, but one could argue that population is a better measure of a country's long-term structural prospects. Relative population magnitudes do not change very fast.

Finance of capital goods imports is a crucial factor affecting growth in developing economies, emphasized in models of the two-gap tradition from Chenery and Bruno (1962) to Bacha (1984). Table 3 uses predicted trade shares from the table 2 regressions to shed light on the process at different levels of per capita income (other right-hand variables are held at their mean levels). The increasing GDP share of capital goods imports with rising income (line 13) has already been noted. How are they paid for?

Table 3
Capital goods import finance at various levels of per capita GNP
(predicted shares).

	\$250	\$850	\$3,000
<i>Imports</i>			
1. Non-oil merch.	19.19	18.90	18.60
2. Oil	2.39	3.59	4.83
3. Serv. exc. trans.	9.63	7.86	6.05
4. Total	31.21	30.35	29.48
<i>Exports</i>			
5. Non-oil merch.	14.85	13.77	12.66
6. Oil	1.54	4.65	7.85
7. Serv. exc. trans.	6.65	6.00	5.33
8. Total	23.04	24.42	25.84
9. C.a. gap (exc. trans.)	8.17	5.93	3.64
<i>Non-cap. surp.</i>			
10. Merch	0.03	1.41	2.85
11. Serv.	-2.98	-1.86	-0.72
12. Total	-2.95	-0.45	2.13
13. Cap. goods imps.	5.22	5.48	5.77
14. Net transfer inflows	3.91	2.10	0.24

To address this question, it is convenient to rearrange entries in the current account as follows:

$$\begin{aligned} \text{Capital goods imports} &= \text{current account gap} \\ &\quad (\text{excluding transfers}) + (\text{merchandise exports} - \text{non-capital} \\ &\quad \text{merchandise imports}) + \text{surplus on factor and} \\ &\quad \text{non-factor services.} \end{aligned} \tag{3}$$

The predicted shares of these components of the current account in table 3 show that at low income levels, the current account gap (excluding net transfers) exceeds capital goods imports. Transfers plus financial inflows used to cover the gap in principle provide the foreign exchange resources required

for imports of capital goods. However, as line 11 shows, the pattern is for developing countries to run deficits on non-factor and factor service trade. Hence, they rely on large and growing surpluses of merchandise exports over non-capital merchandise imports (line 10) to finance capital goods imports, especially at relatively high income levels where net transfers are small (line 14). As discussed below, this pattern (with variations) reappears in most sample splits, and illustrates an important aspect of underdevelopment — when service trade is taken into account, financial capital inflows are not large enough to pay for physical imports of capital goods.

Elasticities of major trade groupings (as a share of GDP) with respect to per capita GNP are as follows:

	Imports	Exports
Primary prod.	0.02	-0.18
Manufactures	-0.02	0.34
Oil	0.33	0.79
Merch. trade	0.03	0.09
Fac. and non-fac. serv.	-0.17	-0.08

The elasticity of the *level* of merchandise imports (constant U.S. dollars) with respect to GNP per capita is about 1.03, on the basis of the above estimates. Since the average annual growth in GNP per capita for the sample countries over the period 1964-82 was about three percent, this implies that volume imports grew at about the same rate over this period. During the period, GNP per capita in the industrialized countries grew about two percent per year. The imports of the developing countries served as a source of demand growth for the industrialized world.

Passing from per capita GNP to other explanatory variables, observe that increased population size reduces most import shares, in line with the usual expectation. Partial elasticities for both merchandise and service trade are -0.22, so a country with twice the population of another is predicted to have import shares more than 40 percent lower. For service exports, the service elasticity is -0.34. For merchandise, it is only -0.22, reflecting the fact that export shares for cereals, textiles, automobiles, and capital goods rise with population. A reasonable hypothesis is that early import substitution in these categories in large countries provides the base for subsequent exports.

Responses of import and export shares to the capacity utilization variables take both signs. Merchandise and service import totals decline, but raw material, intermediate, automobile, and capital goods shares go up, presumably to meet higher aggregate demand (especially for producers' goods). The merchandise export share is strongly related to capacity utilization, with an

elasticity of 0.42. The categories with a positive association are agricultural products (1 through 3) and oil. Except for an insignificant coefficient in category 10, the remaining merchandise export shares other than oil fall as capacity utilization goes up. Causal links are likely to run from the primary commodity exports (including oil) to aggregate demand. In the other categories, higher capacity utilization represents greater domestic demand and diverts sales from abroad to home. For similar reasons, factor service exports (e.g., emigrant worker remittances) and transfers have a negative association with capacity utilization.

Almost all export categories (non-food agriculture and cereals excepted) are positively related to real GDP in OECD countries, as might be expected. Elasticities of merchandise and service shares are, respectively, 0.7 and 0.99, with an average of about 0.89. The level of real GNP in the sample countries has an elasticity with respect to OECD GDP of 1.6 (roughly estimated as the ratio of logarithmic growth rates of the two groups over the sample period). Hence, the elasticity of the *level* of dollar exports is about 2.5. This estimate is consistent with those of other, more macroeconomically oriented studies, e.g., Dornbusch (1984).

The final explanatory variable is the real effective exchange rate, given by *EER*, where

$$EER = \frac{\text{Home country exchange rate index}}{\text{Home country consumer price index}} / \frac{\text{Partner exchange rate index}}{\text{Partner consumer price index}},$$

where partners are weighted by overall trade, oil exports are excluded, and the index is set to 100 in 1978-79.

From price effects alone, a higher real rate should *increase* trade shares in GDP. The results support this view except for imports of cereals, and exports of food products, cereals and (especially) raw materials. Causality may run from high shares of primary product exports to a low real exchange rate, in line with the literature on mineral exporter syndromes. Oil exports, which might be expected to have the same effect, have a positive but insignificant coefficient.

A second observation is that a higher real exchange rate increases import shares of GDP more than export shares (even ignoring raw materials). Shares of oil and service imports rise sharply, probably because prices of these goods are fixed in dollars. The same may be true for service exports as well.

For imports, the elasticity of the share with respect to *EER* minus one gives an approximation to a quantity elasticity, on the assumption that internal prices of importables have a unit elasticity with respect to the exchange rate. 'Quantity elasticity' values by category are:

Imports - Quantity elasticity with respect to EER

Food	-0.88	Transport	-0.55
Cereals	-1.36	Elec. & mech.	-0.69
Non-food ag.	-0.77	Oil	-0.28
Raw mat.	-0.74	Non-oil total	-0.78
Intermed.	-0.74	Merch. total	-0.72
Textiles	-0.91	Non-fac. serv.	-0.11
Autos	-0.72	Fac. serv.	-0.56
Consumer	-0.74	Transfers	0.31

Elasticities of such magnitude are consistent with conventional views about price-responsiveness in trade, e.g., Khan (1974), Williamson (1983) and Bond (1985) on the developing countries. Goldstein and Khan (1985) give similar magnitudes for industrial economies.

Price responsiveness for exports is less clearcut in our developing country sample. As indicated above, share coefficients with respect to the log of *EER* are negative for primary products (except non-food agriculture, which is not significant). Estimated share elasticities for non-Ricardian categories are:

Exports - Share elasticity with respect to EER

Intermed.	0.39	Oil	0.39
Textiles	0.20	Non-oil total (cat. 5-10)	0.31
Autos	0.40	Merch. total (cat. 5-11)	0.35
Consumer	0.18	Non-fac. serv.	0.68
Transport	1.00	Fac. serv.	-0.06
Elec. & mech.	0.36	Transfers	0.81

If these values approximate quantity export demand elasticities for non-primary products, then the standard Marshall-Lerner stability condition (that the sum of absolute import and export demand elasticities exceed one) would barely be satisfied for merchandise trade (the situation is a bit more favorable for services). For manufactured goods, a 35 percent *real* devaluation (which after inflationary effects would require a nominal depreciation of 50-100 percent) would raise their predicted GDP share by 10 percent, from 0.04 to 0.044 at a per capita income level of \$850. Export-led growth acceleration would not obviously result; indeed, modest export pessimism seems to be built into our results.

3. Trade by time period

Now we turn to discussion of several splits of the sample panel. The aim is heuristic - to suggest how different trade patterns may arise in broad categories of countries. No attempt is made at statistical testing, since with a sample of several hundred observations the standard Chow test will say that almost any split is 'significant' by not rejecting the null hypothesis of

different coefficients across groups. It should come as no surprise that nations or time periods differ; the real question is the *economic* importance of the differences across relatively homogenous groups. In large samples, simple statistical tests do not address this issue.

The first split is by time periods: 1964-73 before the first oil shock, 1974-77 between the two shocks, and 1978-82 after the second one. Over the tumultuous two decades in the sample, trade patterns remained quite stable. There were significant changes in direction of trade but this analysis does not include any appropriate variable for this. For broad commodity groups, regression equations for the different periods fit more or less well in the same way as in table 2, and coefficients at least for per capita GNP and population change typically occur only in the second figure after the decimal.

One way of looking at effects of sample splits is through deviations of predicted values given by the subsample equations from predictions given by the pool. Table 4 gives such a breakdown for time periods at different income levels (with the other explanatory variables at their mean levels). For example, the predicted share of food imports from the pool regression when per capita GNP is \$250, is 2.08 percent. The predicted share from the 1964-73 equation is 0.11 percent less (i.e., 1.97 percent) and so on.

Two points stand out in the results of table 4. The first is unsurprising – the oil import and export shares in trade rose by between two to three percent between the first and third period. Secondly, non-oil trade shares for both merchandise and services increased. Both price and quantity effects are no doubt involved in these changes.

Among imports, the largest share increases were for intermediates, capital goods, and non-factor and factor services. Price effects may have been important, especially for the manufactures, since most developing countries had rising incremental capital-output ratios and an adverse shift in the terms of trade after the mid-1970s.

On the side of exports, primary commodity shares declined at most income levels in the final period, reflecting the shift in the terms of trade. On the other hand, deviations of the share of all manufactured exports were as follows:

Manufactured exports

Real GNP per cap.	Pooled sample	Deviation from pooled sample		
		1964-73	1974-77	1978-82
\$250	2.55	-0.26	0.44	1.32
\$850	3.97	-1.12	0.93	2.10
\$3000	5.43	-2.00	1.43	2.88

The increases in the final period outweigh reductions in the total primary

Table 4
Imports.

Sector	Per capita GNP (1982)	Pooled sample	Deviation from pooled sample		
			1964– 1973	1974– 1977	1978– 1982
Food	US\$ 250	2.08	-0.11	-0.07	0.20
	US\$ 850	2.08	-0.10	0.11	0.17
	US\$ 3000	2.07	-0.09	0.16	0.14
Cereal	US\$ 250	1.40	-0.26	0.37	0.25
	US\$ 850	1.17	-0.20	0.20	0.13
	US\$ 3000	0.93	-0.14	0.03	-0.00
Nfoodagr	US\$ 250	0.74	-0.01	0.00	-0.03
	US\$ 850	0.92	-0.04	0.05	-0.02
	US\$ 3000	1.09	-0.06	0.10	-0.00
Rawmat	US\$ 250	0.25	0.01	0.04	0.05
	US\$ 850	0.40	0.00	0.06	0.05
	US\$ 3000	0.55	-0.01	0.09	0.05
Intermed	US\$ 250	4.61	-0.66	0.62	0.84
	US\$ 850	4.69	-0.74	0.58	0.56
	US\$ 3000	4.78	-0.83	0.54	0.27
Textiles	US\$ 250	1.79	0.22	-0.25	-0.27
	US\$ 850	1.20	0.06	-0.02	-0.03
	US\$ 3000	0.60	-0.10	0.22	0.20
Autos	US\$ 250	0.88	-0.03	0.11	0.10
	US\$ 850	0.87	-0.01	0.03	0.15
	US\$ 3000	0.86	0.00	-0.06	0.20
Consumer	US\$ 250	2.22	-0.10	-0.02	0.14
	US\$ 850	2.09	-0.19	-0.04	0.18
	US\$ 3000	1.95	-0.29	-0.06	0.21
Transport	US\$ 250	1.38	-0.12	0.23	0.23
	US\$ 850	1.24	-0.20	0.30	0.31
	US\$ 3000	1.11	-0.29	0.38	0.40
Elecmech	US\$ 250	3.84	-0.50	0.42	0.73
	US\$ 850	4.24	-0.56	0.42	0.67
	US\$ 3000	4.66	-0.62	0.42	0.61
Oil	US\$ 250	2.39	-1.12	0.64	2.24
	US\$ 850	3.59	-1.48	1.01	1.63
	US\$ 3000	4.83	-1.84	1.38	0.99
Noiltot	US\$ 250	19.20	-1.68	1.70	2.27
	US\$ 850	18.93	-2.15	1.80	2.15
	US\$ 3000	18.65	-2.63	1.90	2.02
Totmerch	US\$ 250	21.50	-2.78	2.47	4.51
	US\$ 850	22.42	-3.59	2.95	3.79
	US\$ 3000	23.36	-4.42	3.44	3.05
NFS	US\$ 250	6.45	-1.55	1.12	0.89
	US\$ 850	4.43	-1.30	0.63	1.31
	US\$ 3000	2.35	-1.05	0.13	1.74
Facinc	US\$ 250	3.18	-0.39	-0.31	0.81
	US\$ 850	3.43	-0.56	-0.38	0.97
	US\$ 3000	3.70	-0.74	-0.46	1.14
Transfer	US\$ 250	1.31	-0.09	0.15	-0.04
	US\$ 850	0.61	-0.20	0.11	0.15
	US\$ 3000	-0.11	-0.31	0.07	0.34
Totservs	US\$ 250	10.86	-1.92	1.03	1.74
	US\$ 850	8.40	-1.96	0.43	2.50
	US\$ 3000	5.87	-2.00	-0.19	3.28
Grandtot	US\$ 250	33.25	-5.39	1.99	5.57
	US\$ 850	30.60	-5.98	1.99	6.48
	US\$ 3000	27.86	-6.58	1.99	7.41

Table 4 (continued)
Exports.

Sector	Per capita GNP (1982)	Pooled sample	Deviation from pooled sample		
			1964- 1973	1974- 1977	1978- 1982
Food	US\$ 250	7.04	-0.03	0.46	-0.36
	US\$ 850	5.38	-0.12	0.27	-0.47
	US\$ 3000	3.68	-0.21	0.08	-0.58
Cereal	US\$ 250	0.19	0.06	0.03	0.04
	US\$ 850	0.21	-0.00	0.05	0.09
	US\$ 3000	0.22	-0.07	0.06	0.14
Nfoodagr	US\$ 250	3.07	0.22	0.00	-0.62
	US\$ 850	2.05	0.12	-0.07	-0.35
	US\$ 3000	1.01	0.02	-0.14	-0.08
Rawmat	US\$ 250	2.00	-0.58	0.68	0.92
	US\$ 850	2.16	0.19	0.37	-0.33
	US\$ 3000	2.32	0.99	0.06	-1.62
Intermed	US\$ 250	1.20	-0.07	-0.20	0.28
	US\$ 850	1.58	-0.37	0.13	0.37
	US\$ 3000	1.97	-0.67	0.47	0.46
Textiles	US\$ 250	0.83	-0.19	0.19	0.42
	US\$ 850	1.04	-0.35	0.22	0.54
	US\$ 3000	1.25	-0.51	0.26	0.66
Autos	US\$ 250	-0.08	-0.02	-0.02	-0.04
	US\$ 850	-0.03	-0.04	-0.00	0.01
	US\$ 3000	0.02	-0.07	0.01	0.06
Consumer	US\$ 250	0.51	-0.04	0.23	0.46
	US\$ 850	0.96	-0.26	0.30	0.72
	US\$ 3000	1.43	-0.49	0.38	0.98
Transport	US\$ 250	-0.02	0.08	0.07	0.14
	US\$ 850	0.08	0.04	0.08	0.19
	US\$ 3000	0.18	0.00	0.09	0.24
Elecmech	US\$ 250	0.11	-0.02	0.17	0.06
	US\$ 850	0.34	-0.14	0.20	0.27
	US\$ 3000	0.58	-0.26	0.22	0.48
Oil	US\$ 250	1.54	-0.83	0.81	0.66
	US\$ 850	4.65	-1.05	1.67	1.15
	US\$ 3000	7.85	-1.28	2.55	1.65
Noiltot	US\$ 250	15.09	-0.86	1.05	0.69
	US\$ 850	14.07	-1.22	1.04	0.52
	US\$ 3000	13.01	-1.58	1.03	0.34
Totmerch	US\$ 250	16.70	-1.59	2.27	1.50
	US\$ 850	18.64	-2.03	2.90	1.64
	US\$ 3000	20.65	-2.48	3.54	1.79
NFS	US\$ 250	4.90	-0.35	0.48	0.74
	US\$ 850	4.42	-0.50	0.12	1.27
	US\$ 3000	3.93	-0.65	-0.26	1.81
Facinc	US\$ 250	1.75	0.03	-0.06	-0.21
	US\$ 850	1.58	-0.19	0.09	0.06
	US\$ 3000	1.40	-0.42	0.24	0.33
Transfer	US\$ 250	5.22	-1.44	1.17	1.74
	US\$ 850	2.71	-0.98	0.85	2.15
	US\$ 3000	0.13	-0.50	0.52	2.56
Totservs	US\$ 250	11.91	-1.97	1.33	2.38
	US\$ 850	8.76	-1.87	0.77	3.55
	US\$ 3000	5.52	-1.77	0.21	4.76
Grandtot	US\$ 250	27.95	-3.34	3.19	4.34
	US\$ 850	25.24	-4.03	3.18	5.80
	US\$ 3000	22.44	-4.73	3.17	7.30

share (-0.02, -1.06 and -2.14 at the three income levels) and reflect country trade diversification in response to the oil shocks and the decline in terms of trade.⁶

Despite these shifts in some categories, the overall changes were on the order of one percent of GDP – in that sense trade patterns were stable. The same is true for response parameters with respect to the structural variables – per capita GNP and population. Table 5 illustrates this observation with partial elasticities for non-oil merchandise and non-factor service trade. The estimates for *GNPPC* and *POP* in the pool and sub-period vary in a narrow range; the same is less true for the other explanatory variables. Trade patterns maintained themselves but responses to policy-related variables fluctuated over the 19-year sample period.

Table 5
Elasticities with respect to explanatory variables by sub-period – non-oil merchandise and non-factor service trade shares.

	Pool	1964-73	1974-77	1978-82
Non-oil merch.				
Imports				
<i>GNPPC</i>	-0.01	-0.03	-0.01	-0.01
<i>POP</i>	-0.22	-0.23	-0.21	-0.27
<i>Y/Y*</i>	-0.06	0.05	-0.32	0.52
<i>EER</i>	0.22	0.04	0.13	0.59
Non-factor service				
Imports				
<i>GNPPC</i>	-0.31	-0.36	-0.32	-0.21
<i>POP</i>	-0.33	-0.29	-0.40	-0.37
<i>Y/Y*</i>	-0.58	-0.58	-0.99	0.86
<i>EER</i>	0.89	0.77	0.76	-0.01
Non-oil merch.				
Exports				
<i>GNPPC</i>	-0.06	-0.08	-0.05	-0.07
<i>POP</i>	-0.22	-0.23	-0.23	-0.18
<i>OECD-GDP</i>	0.45	0.16	0.66	-0.85
<i>Y/Y*</i>	0.12	0.93	0.56	-0.69
<i>EER</i>	-0.11	-0.07	-0.33	0.11
Non-factor service				
Exports				
<i>GNPPC</i>	-0.08	-0.12	-0.14	0.01
<i>POP</i>	-0.32	-0.31	-0.31	-0.37
<i>OECD-GDP</i>	0.70	0.01	0.82	4.41
<i>Y/Y*</i>	-0.18	0.45	-0.67	0.49
<i>EER</i>	0.68	0.88	0.90	0.50

⁶For detailed country analysis, see Helleiner (1985).

4. Growth performance

Relationships between trade and growth have long been debated in development economics. In this section, we approach the question in a slightly novel fashion, asking if country growth rate differences have any impact on their observed patterns of trade. Many studies run the regression the other way, i.e., from export orientation to growth. Our procedure – using sample splits by economic ‘performance’ to investigate trade patterns – is no less justified in terms of causality, and allows greater disaggregation. We use it for that reason.

First, a word on ‘performance’. As fig. 1 illustrates, there is a positive relationship between 1982 per capita GNP levels and 1964–82 growth rates. Growth over the period itself is not enough to explain the association. The data, therefore, suggest that richer developing countries in the recent past have grown faster than poor ones. The regression equation using end-of-period income to ‘explain’ growth is

$$\text{GDP growth rate} = 0.17 + 0.67 \ln \text{GNPPC}(82), \quad R^2 = 0.119, \\ (0.10) (2.68)$$

with *t*-values in parentheses. Results are not strikingly different if income in earlier years is used on the right-hand side. We thus classify countries as high (low) performers according to whether their actual growth rate lay above (below) the regression line. A further split was made by per capita income level, with \$1,000 as the dividing line. Growth rates of GDP in the different groups (annual percentage rate) were as follows:

Low performers		High performers	
All	3.48	All	7.00
Low income	3.51	Low income	7.07
High income	3.62	High income	6.98

The growth rate for the sample as a whole (from a semi-log regression on time) was 5.51 percent.

Given such large differences in growth rates between the two groups (a 3.5 percent growth rate differential will double the income ratio between two countries in about 20 years), it is striking how similar their trade patterns are. Table 6 illustrates this point with respect to financing imports of capital goods.

Note first from line 15 that when all right-hand side variables in the regression are set at their (sub-) sample mean values except for per capita income, low performers have a higher capital goods import share at all income levels. They run bigger current account gaps (line 11) but have lower surpluses on factor and non-factor service trade. Hence, merchandise trade surpluses in the two groups are of similar size.

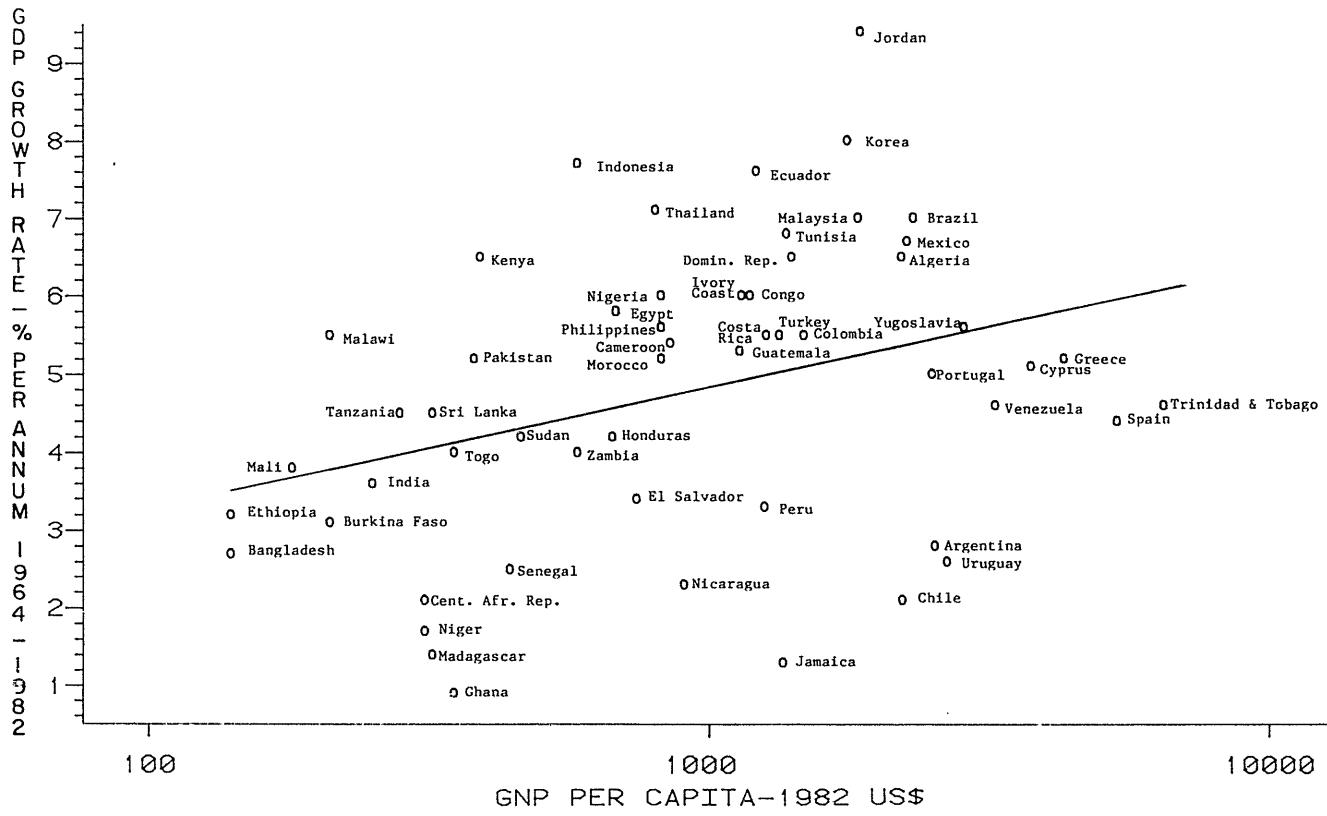


Fig. 1. GDP growth rate v. GNP per capita.

Table 6
Capital goods import finance in countries grouped by performance (deviations from pool regression).

GNP per capita	\$250			\$850			\$3000		
	Pool pred.	Low perf.	High perf.	Pool pred.	Low perf.	High perf.	Pool pred.	Low perf.	High perf.
Imports									
1. Prim. prod.	4.47	0.64	-0.21	4.57	0.69	-0.08	4.64	0.76	0.05
2. Total manuf.	14.72	2.61	-0.72	14.33	1.94	-0.25	13.96	1.27	0.23
3. Oil	2.39	0.20	0.00	3.59	-0.92	0.33	4.83	-2.08	0.67
4. Serv. exc. trans.	9.63	0.99	-0.33	7.86	2.88	-1.79	6.05	4.82	-3.29
5. Total	31.21	4.44	-1.26	30.35	4.59	-1.79	29.48	4.77	-2.34
Exports									
6. Prim. prod.	12.30	0.54	0.34	9.80	0.97	0.10	7.23	1.43	-0.15
7. Total manuf.	2.55	0.27	0.34	3.97	0.61	0.23	5.43	0.94	0.11
8. Oil	1.54	1.51	-1.08	4.65	-0.91	0.12	7.85	-3.41	1.36
9. Serv. exc. trans.	6.65	1.09	-1.51	6.00	1.45	-1.26	5.33	1.81	-1.01
10. Total	23.04	3.41	-1.91	24.42	2.12	-0.81	25.84	0.77	-0.31
11. C.a. gap (exc. transfers)	8.17	1.03	0.65	5.93	2.47	-0.98	3.64	4.00	-2.65
Non-cap. surplus									
12. Non-oil merch.	0.03	-0.05	-0.04	1.41	-0.22	-0.08	2.85	-0.43	0.20
13. Serv. exc. trans.	-2.98	0.10	-1.18	-1.86	-1.43	0.53	-0.72	-0.43	2.28
14. Total	-2.95	-0.05	-1.22	-0.45	-1.65	0.61	2.13	-3.44	2.48
15. Cap. goods imps.	5.22	1.08	-0.57	5.48	0.82	-0.37	5.77	0.56	-0.17
16. Net transfer inflows	3.91	-0.26	-0.94	2.10	1.02	-0.71	0.24	2.34	-0.45

The low performers' economies are *more* open than those of the high performers, with higher total import and export shares (lines 5 and 10). They import more primary products, manufactures and oil (lines 1-3) and export more primary products and manufactures but – except at low income levels – less oil (lines 6-8). The slow growers also receive a higher transfer share of GDP (line 16). The deviations in all these categories are a few percent at most – well within the range of standard errors from table 1.

Table 7 goes into more detail on deviations from the pool regression for different trade categories. The more open nature of the low performing economies shows up in most, e.g., higher imports (or less substitution) of food, raw materials, intermediates, and electrical and mechanical equipment; exports of food and non-food agriculture, and consumer goods. The major deviations by category are in service trade, where the low performers are again more open, and have a greater excess of imports over exports than do the high performers. Finally, shares of non-oil merchandise exports by group are:

	\$250	\$850	\$3000
Pool pred. value	15.09	14.07	13.01
Low perf. deviation	0.59	1.28	2.00
High perf. deviation	0.25	-0.06	-0.38

Non-oil commodity exports do not seem to 'lead' growth in any obvious sense – their GDP share declines in all countries, but more in the high performers. *Relative* specialization in the slow growers runs more toward primary products (especially agricultural exports). For commodity trade, that appears to be the main distinction between the two sets of countries. For factor and non-factor services, the high performers have lower shares of both imports and exports, especially the former.

The story on trade elasticities is similar. The high performers have a slightly higher elasticity of their non-oil export share with respect to OECD GDP – the value is 0.38 as opposed to 0.27 for the low performers. Other elasticity differences between the two major groups are of similar magnitude or smaller. When the high and low performers are split into sub-samples by income level, the higher export elasticities with respect to OECD income carry over to the smaller groups. Elasticities with respect to per capita GNP for major export categories are:

	Low performers			High performers			
	Pool	All	Low inc.	High inc.	All	Low inc.	High inc.
Primary	-0.18	-0.20	0.63	-1.16	-0.15	0.02	0.06
Manufactures	0.34	0.30	0.36	-0.28	0.42	-0.08	0.0
Services	-0.08	-0.07	-0.49	-0.74	-0.04	0.34	0.07

Table 7

Deviations by country performance groups of predicted trade shares from pooled sample predictions.

Sector	Per capita GNP (1982)	Imports			Exports		
		Pooled sample	Low perf.	High perf.	Pooled sample	Low perf.	High perf.
Food	US\$ 250	2.08	0.37	0.07	7.04	0.55	-0.13
	US\$ 850	2.08	0.45	0.11	5.38	1.46	-0.35
	US\$ 3000	2.07	0.53	0.15	3.68	2.41	-0.57
Cereal	US\$ 250	1.40	0.18	-0.13	0.19	0.07	-0.10
	US\$ 850	1.17	0.12	-0.06	0.21	-0.33	0.07
	US\$ 3000	0.93	0.06	0.02	0.22	-0.75	0.24
Nfoodagr	US\$ 250	0.74	0.05	-0.08	3.07	0.88	-0.66
	US\$ 850	0.92	0.01	-0.05	2.05	0.23	-0.29
	US\$ 3000	1.09	-0.02	-0.03	1.01	-0.44	0.09
Rawmat	US\$ 250	0.25	0.04	-0.07	2.00	-0.96	1.23
	US\$ 850	0.40	0.11	-0.08	2.16	-0.39	0.67
	US\$ 3000	0.55	0.19	-0.09	2.32	0.21	0.09
Intermed	US\$ 250	4.61	0.79	-0.40	1.20	0.00	0.20
	US\$ 850	4.69	0.48	-0.24	1.58	0.03	0.20
	US\$ 3000	4.78	0.17	-0.08	1.97	0.05	0.20
Textiles	US\$ 250	1.79	0.25	0.15	0.83	0.04	-0.20
	US\$ 850	1.20	0.29	0.17	1.04	-0.21	-0.11
	US\$ 3000	0.60	0.33	0.20	1.25	-0.48	-0.02
Autos	US\$ 250	0.88	0.13	0.03	-0.08	0.12	0.13
	US\$ 850	0.87	0.04	0.08	-0.03	0.14	0.13
	US\$ 3000	0.86	-0.05	0.13	0.02	0.17	0.13
Consumer	US\$ 250	2.22	0.36	0.07	0.51	0.01	-0.09
	US\$ 850	2.09	0.31	0.11	0.96	0.18	-0.15
	US\$ 3000	1.95	0.26	0.15	1.43	0.36	-0.21
Transport	US\$ 250	1.38	0.50	-0.17	-0.02	0.05	0.21
	US\$ 850	1.24	0.21	0.00	0.08	0.16	0.18
	US\$ 3000	1.11	-0.09	0.18	0.18	0.27	0.14
Elecmech	US\$ 250	3.84	0.58	-0.40	0.11	0.05	0.09
	US\$ 850	4.24	0.61	-0.37	0.34	0.31	-0.02
	US\$ 3000	4.66	0.65	-0.35	0.58	0.57	-0.13
Oil	US\$ 250	2.39	0.20	-0.00	1.54	1.51	-1.08
	US\$ 850	3.59	-0.92	0.33	4.65	-0.91	0.12
	US\$ 3000	4.83	-2.08	0.67	7.85	-3.41	1.36
Noiltot	US\$ 250	19.20	3.21	-1.03	15.09	0.59	0.25
	US\$ 850	18.93	2.62	-0.46	14.07	1.28	-0.06
	US\$ 3000	18.65	2.01	0.12	13.01	2.00	-0.38
Totmerch	US\$ 250	21.50	3.50	-0.91	16.70	2.15	-0.62
	US\$ 850	22.42	1.80	-0.01	18.64	0.55	0.23
	US\$ 3000	23.36	0.04	0.93	20.65	-1.10	1.12
NFS	US\$ 250	6.45	1.62	0.59	4.90	0.79	-0.88
	US\$ 850	4.43	2.70	-1.14	4.42	0.65	-1.27
	US\$ 3000	2.35	3.81	-2.92	3.93	0.49	-1.68
Facinc	US\$ 250	3.18	-0.63	-0.92	1.75	0.30	-0.63
	US\$ 850	3.43	0.18	-0.65	1.58	0.80	0.01
	US\$ 3000	3.70	1.01	-0.37	1.40	1.32	0.67
Transfer	US\$ 250	1.31	-0.23	-0.31	5.22	-0.49	-1.25
	US\$ 850	0.61	0.40	-0.02	2.71	1.42	-0.73
	US\$ 3000	-0.11	1.04	0.27	0.13	3.38	-0.18
Totservs	US\$ 250	10.86	-1.14	-2.66	11.91	0.73	-2.75
	US\$ 850	8.40	1.92	-2.62	8.76	2.97	-1.98
	US\$ 3000	5.87	5.07	-2.59	5.52	5.28	-1.18
Grandtot	US\$ 250	33.25	1.98	-3.90	27.95	4.27	-2.42
	US\$ 850	30.60	3.98	-2.28	25.24	6.29	0.51
	US\$ 3000	27.86	6.05	-0.60	22.44	8.37	3.54

Export-led growth in the form of high share elasticities, even for manufactures among high-income, high-performance countries, is not apparent.

5. Oil exporters and importers

In the contemporary world, there is obvious interest in the different economic performances of oil exporting and importing countries. There are 10 oil exporters⁷ in our sample; the difference between this group and the other 45 countries with respect to the financing of capital goods imports is illustrated in table 8. Over the sample period, total GDP grew at 7.0 percent per year in the exporter, and 5.0 percent in the importer group.

Note in line 16 that the exporting group is predicted to have higher capital goods imports than the oil purchasers; this difference is probably related to their faster growth. The oil exporters' economies are also more open than those of the overall sample – imports (line 5), exports (line 10) and their current account gaps (line 11) generally exceed the pool's. At both income levels above \$250, they import more of all the broad commodity groups (including oil), but their non-oil trade deficits are substantially higher. Lines 12 and 14 show net deficits of about six percent of GDP each for both non-oil merchandise and services at the \$850 income level and around ten percent at \$3,000. The petro-economies' lack of export diversification shows up sharply, despite their overall high trade shares.

Imports and exports (in total, and for most categories) of the oil importers lie below those of the pool – by about one percent for the totals at \$250, three percent at \$850, and five percent at \$3,000. On the other hand, the importers have higher net surpluses on non-oil merchandise trade (excluding capital goods imports) in line 12, and services in line 14.

Their capital goods imports lie a bit below the pool's average. The petroleum importing countries have to run surpluses of several percent of GDP in goods and services apart from oil and capital goods to pay for imports of these last two categories. Oil exporters don't bear such a burden, and the differences in trading patterns of the two groups of countries derive from this fact.

6. Country size

So far, we have seen that trade patterns are not notably affected by time period and country performance, while oil exporters and importers differ in plausible fashion. Contrasts are a bit sharper in two other sample splits – by population size and region. We take up the first here, separating countries with populations above and below 20 million in 1982.

⁷See table A.1 for listing and definition.

Table 8
Capital goods imports finance in oil exporting and importing countries (deviations from prediction of pooled regression).

GNP per capita	\$250			\$850			\$3000		
	Pool pred.	Oil exp.	Oil imp.	Pool pred.	Oil exp.	Oil imp.	Pool pred.	Oil exp.	Oil imp.
Imports									
1. Prim. prod.	4.47	0.91	-0.20	4.57	0.25	-0.23	4.64	-0.43	-0.26
2. Total manuf.	14.72	-0.21	-0.26	14.33	1.85	-0.68	13.96	3.99	-1.10
3. Oil	2.39	-1.94	0.23	3.59	1.02	-0.59	4.83	4.07	-1.44
4. Serv. exc. trans.	9.63	2.35	-0.84	7.86	5.33	-1.40	6.05	8.39	-1.98
5. Total	31.21	1.11	-1.07	30.35	8.45	-2.90	29.48	16.02	-4.78
Exports									
6. Prim. prod.	12.30	0.61	-0.09	9.80	-2.86	0.63	7.23	-6.43	1.37
7. Total manuf.	2.55	0.19	0.35	3.97	-1.58	0.66	5.43	-3.38	0.97
8. Oil	1.54	0.98	-1.07	4.65	13.15	-4.23	7.85	25.70	-7.50
9. Serv. exc. trans.	6.65	-0.61	-0.03	6.00	-1.09	0.12	5.33	-1.60	-0.26
10. Total	23.04	1.17	-0.84	24.42	7.62	-2.82	25.84	14.29	-4.90
11. C.a. gap (exc. transfers)	8.17	-0.06	-0.23	5.93	0.83	-0.08	3.64	1.73	0.12
Non-cap. surplus									
12. Non-oil merch.	0.88	0.33	0.56	0.35	-5.31	1.80	-0.17	-11.10	3.05
13. Oil	-0.85	2.92	-1.30	1.06	12.13	-3.64	3.02	21.63	-6.06
14. Serv. exc. trans.	-2.98	-2.96	0.81	-1.86	-6.42	1.52	-0.72	-9.99	2.24
15. Total	-2.95	0.29	0.07	-0.45	-0.40	-0.32	2.13	0.54	-0.77
16. Cap. goods imps.	5.22	0.23	-0.16	5.48	1.23	-0.40	5.77	2.27	-0.65
17. Net transfer inflows	3.91	-2.18	0.07	2.10	-1.08	0.25	0.24	0.04	0.42

Mean trade shares for the countries with population above and below 20 million in 1982:

	Large	Small
Merch. imports	15.12	25.79
Serv. imports	5.10	9.48
Merch. exports	11.95	20.94
Serv. exports	4.20	6.57

It is clear that the larger economies are on average much more closed to trade than small ones. They also grew faster - 5.7 percent per year as opposed to 4.8 percent for small countries.

Table 9 gives deviations from the pooled regressions for the two size groups, as well as the regions discussed in the next section. On the import side, note that the merchandise share in GDP declines with income in big countries, while it rises in small ones. The same is true for most import categories - oil and raw materials have the only rising shares in large economies, cereals and textiles the only falling ones in the small economies. For textiles and non-factor services, shares are low in large economies at low income levels - import substitution occurs early. The decline in shares of these categories takes place at higher income levels in less populous countries.

For merchandise exports, the GDP share of the total again goes down with income in the populous countries, and rises in the others. Both groups show declining shares for primary products and rising ones for manufactures (except textiles in big countries), but the transition takes place at higher income levels in the smaller economies. There are differences on the order of several percent of GDP in patterns of export specialization in food and non-food agriculture, and raw materials. At a per capita GNP level of \$850, the share of these three categories is predicted to be 8.14 percent higher in small countries. Share differences in manufactured exports and all imports are spread much more evenly across categories. The large countries have higher export shares for cereals and most manufactures.

Predicted patterns of capital goods import finance appear in table 10. Large countries have smaller deficits on non-factor and factor service trade and import fewer capital goods. Except at low income levels, they rely less on a merchandise surplus net of capital imports to finance their foreign purchases of investment goods. Consistent with their more open economies, the smaller countries have larger current account gaps (net of transfers) overall. Their non-capital goods merchandise surpluses increase with income (import substitution and export promotion come 'later' for small countries) while those of the large countries decline.

Table 9

Deviations by population size and region of predicted trade shares from pooled sample predictions - Imports.

Sector	Per capita GNP (1982)	Pooled sample	High pop.	Low pop.	Africa	Asia	Eur. E. & N.A.	Mid. & Carib.	Lat. Am.
Food	US\$ 250	2.08	-0.74	0.44	0.15	-0.33	2.71	-0.86	
	US\$ 850	2.08	-0.99	0.59	0.93	-0.46	1.15	-0.47	
	US\$ 3000	2.07	-1.25	0.74	1.73	-0.59	-0.46	-0.08	
Cereal	US\$ 250	1.40	-0.22	0.10	-0.27	0.49	1.72	-0.43	
	US\$ 850	1.17	-0.45	0.21	0.23	-0.65	0.47	-0.23	
	US\$ 3000	0.93	-0.69	0.32	0.75	-1.82	-0.82	-0.03	
Nfoodagr	US\$ 250	0.74	0.18	-0.08	-0.23	0.33	0.72	-0.43	
	US\$ 850	0.92	-0.04	-0.03	-0.66	1.37	0.50	-0.41	
	US\$ 3000	1.09	-0.27	0.02	-1.10	2.44	0.27	-0.38	
Rawmat	US\$ 250	0.25	0.09	-0.06	-0.09	0.31	0.05	-0.13	
	US\$ 850	0.40	0.13	-0.10	-0.27	0.98	0.17	-0.18	
	US\$ 3000	0.55	0.17	-0.14	-0.46	1.67	0.29	-0.23	
Intermed	US\$ 250	4.61	-1.09	0.48	-0.15	-0.60	1.49	1.20	
	US\$ 850	4.69	-1.60	0.85	0.74	0.58	0.61	-0.07	
	US\$ 3000	4.78	-2.13	1.22	1.66	1.79	-0.29	-1.38	
Textiles	US\$ 250	1.79	-0.99	0.51	0.49	-0.84	0.28	-0.19	
	US\$ 850	1.20	-0.75	0.44	1.13	-0.24	0.32	-0.07	
	US\$ 3000	0.60	-0.49	0.36	1.79	0.37	0.36	0.06	
Autos	US\$ 250	0.88	-0.26	0.19	0.17	-0.24	0.23	-0.29	
	US\$ 850	0.87	-0.41	0.32	0.24	0.27	0.12	-0.05	
	US\$ 3000	0.86	-0.56	0.44	0.32	0.78	0.01	0.19	
Consumer	US\$ 250	2.22	-1.08	0.46	0.16	-1.07	0.53	0.70	
	US\$ 850	2.09	-1.19	0.61	0.52	-0.07	0.24	0.09	
	US\$ 3000	1.95	-1.31	0.76	0.90	0.95	-0.06	-0.54	
Transport	US\$ 250	1.38	-0.30	0.25	0.26	-0.41	0.41	-0.23	
	US\$ 850	1.24	-0.55	0.43	0.43	0.12	0.44	-0.16	
	US\$ 3000	1.11	-0.80	0.62	0.60	0.68	0.46	-0.10	
Elecmech	US\$ 250	3.84	-0.52	0.29	0.29	-0.13	1.23	-0.20	
	US\$ 850	4.24	-0.99	0.59	1.16	2.67	0.58	-0.42	
	US\$ 3000	4.66	-1.47	0.89	2.06	5.56	-0.09	-0.65	
Oil	US\$ 250	2.39	-0.58	0.18	-0.18	0.52	-0.46	-3.54	
	US\$ 850	3.59	-1.51	0.97	-1.15	1.41	-0.38	0.01	
	US\$ 3000	4.83	-2.47	1.77	-2.14	2.34	-0.29	3.67	
Noiltot	US\$ 250	19.20	-5.10	2.61	0.84	-2.48	9.32	-0.85	
	US\$ 850	18.93	-6.96	3.89	4.66	4.58	4.55	-2.04	
	US\$ 3000	18.65	-8.88	5.22	8.59	11.86	-0.35	-3.26	
Totmerch	US\$ 250	21.50	-5.59	2.78	0.69	-1.83	8.89	-4.36	
	US\$ 850	22.42	-8.37	4.85	3.55	6.15	4.21	-1.99	
	US\$ 3000	23.36	-11.23	6.98	6.48	14.38	-0.61	0.44	
NFS	US\$ 250	6.45	-3.63	1.73	3.18	-3.09	-0.42	-2.62	
	US\$ 850	4.43	-2.31	1.30	6.18	-0.65	-0.21	-0.41	
	US\$ 3000	2.35	-0.95	0.86	9.27	1.85	0.00	1.87	
Facinc	US\$ 250	3.18	-0.88	0.40	0.58	-1.23	3.47	-0.01	
	US\$ 850	3.43	-1.15	0.71	1.85	0.68	0.46	0.19	
	US\$ 3000	3.70	-1.43	1.02	3.16	2.65	-2.65	0.39	
Transfer	US\$ 250	1.31	-0.96	0.56	1.38	-1.07	0.16	-1.22	
	US\$ 850	0.61	-0.40	0.30	3.34	-0.06	0.12	-0.29	
	US\$ 3000	-0.11	0.18	0.03	5.36	0.99	0.08	0.67	
Totservs	US\$ 250	10.86	-5.45	2.68	5.21	-5.31	3.30	-3.78	
	US\$ 850	8.40	-3.83	2.29	11.44	0.05	0.46	-0.44	
	US\$ 3000	5.87	-2.17	1.89	17.86	5.57	-2.47	3.00	
Grandtot	US\$ 250	33.25	-12.09	5.92	5.14	-7.78	17.49	-3.31	
	US\$ 850	30.60	-12.19	7.17	14.62	4.25	7.98	-3.38	
	US\$ 3000	27.86	-12.29	8.45	24.39	16.76	-1.82	-3.46	

Table 9 (continued)

Deviations by population size and region of predicted trade shares from pooled sample predictions - Exports.

Sector	Per capita GNP (1982)	Pooled sample	High pop.	Low pop.	Africa	Asia	Eur. E. & N.A.	Mid. & Carib.	Lat. Am.
Food	US\$ 250	7.04	-3.54	1.61	0.96	-2.91	-3.45	8.54	
	US\$ 850	5.38	-2.77	1.36	5.67	-2.02	-2.24	1.93	
	US\$ 3000	3.68	-1.97	1.11	10.52	-1.10	-0.99	-4.88	
Cereal	US\$ 250	0.19	0.48	-0.10	0.01	0.52	0.20	-0.20	
	US\$ 850	0.21	0.44	-0.14	-0.09	0.22	-0.03	0.23	
	US\$ 3000	0.22	0.39	-0.17	-0.19	-0.08	-0.27	0.67	
Nfoodagr	US\$ 250	3.07	-1.36	0.43	0.32	0.95	-0.89	-0.05	
	US\$ 850	2.05	-1.16	0.56	1.22	6.52	-0.84	-0.48	
	US\$ 3000	1.01	-0.96	0.70	2.16	12.26	-0.79	-0.92	
Rawmat	US\$ 250	2.00	-1.12	0.55	1.70	-0.45	0.90	-0.72	
	US\$ 850	2.16	-1.47	0.82	6.21	2.49	-0.60	-0.35	
	US\$ 3000	2.32	-1.84	1.10	10.85	5.51	-2.16	0.03	
Intermed	US\$ 250	1.20	-0.59	0.18	0.05	-0.12	-0.45	-0.29	
	US\$ 850	1.58	-0.56	0.23	-0.21	1.29	-0.04	0.04	
	US\$ 3000	1.97	-0.52	0.28	-0.47	2.74	0.37	0.38	
Textiles	US\$ 250	0.83	0.58	-0.36	-0.63	1.11	0.44	0.08	
	US\$ 850	1.04	0.01	-0.04	-0.80	1.60	0.49	-0.56	
	US\$ 3000	1.25	-0.59	0.29	-0.98	2.10	0.54	-1.22	
Autos	US\$ 250	-0.08	0.04	0.13	0.04	0.15	0.17	0.07	
	US\$ 850	-0.03	0.10	0.10	0.01	0.17	0.28	0.04	
	US\$ 3000	0.02	0.17	0.08	-0.01	0.20	0.39	0.02	
Consumer	US\$ 250	0.51	0.19	0.04	-0.34	0.66	0.32	0.57	
	US\$ 850	0.96	0.02	0.10	-0.74	3.06	0.52	-0.28	
	US\$ 3000	1.43	-0.16	0.16	-1.14	5.53	0.72	-1.15	
Transport	US\$ 250	-0.02	0.07	0.11	0.14	0.09	-0.11	0.02	
	US\$ 850	0.08	0.14	0.05	0.09	0.47	0.06	0.02	
	US\$ 3000	0.18	0.22	-0.01	0.04	0.86	0.23	0.02	
Elecmech	US\$ 250	0.11	-0.01	0.03	0.01	0.38	-0.11	0.07	
	US\$ 850	0.34	0.07	-0.02	-0.10	1.80	0.22	-0.15	
	US\$ 3000	0.58	0.14	-0.07	-0.22	3.26	0.56	-0.38	
Oil	US\$ 250	1.54	1.57	-0.91	0.94	0.47	2.91	-12.01	
	US\$ 850	4.65	-2.21	1.40	1.61	-0.97	-1.74	0.74	
	US\$ 3000	7.85	-6.11	3.79	2.30	-2.46	-6.53	13.88	
Noiltot	US\$ 250	15.09	-5.44	2.64	1.86	0.04	-3.41	7.92	
	US\$ 850	14.07	-5.44	3.05	10.95	15.11	-2.69	0.25	
	US\$ 3000	13.01	-5.44	3.48	20.32	30.65	-1.94	-7.66	
Totmerch	US\$ 250	16.70	-3.91	1.67	2.51	0.33	-0.56	-3.84	
	US\$ 850	18.64	-7.66	4.41	12.17	14.26	-4.35	1.01	
	US\$ 3000	20.65	-11.54	7.23	22.12	28.61	-8.26	6.00	
NFS	US\$ 250	4.00	-2.39	1.11	1.40	-3.08	3.74	-0.98	
	US\$ 850	4.42	-1.74	0.78	2.34	-2.02	1.88	-0.45	
	US\$ 3000	3.93	-1.07	0.44	3.31	-0.94	-0.04	0.09	
Facinc	US\$ 250	1.75	-0.64	0.26	0.11	-0.08	1.04	-1.09	
	US\$ 850	1.58	-0.82	0.43	-0.45	1.28	0.87	-0.47	
	US\$ 3000	1.40	-1.01	0.61	-1.03	2.68	0.69	0.17	
Transfer	US\$ 250	5.22	-1.75	1.00	-0.41	-2.71	12.88	-3.40	
	US\$ 850	2.71	-0.81	0.15	-4.39	-5.41	5.97	-1.74	
	US\$ 3000	0.13	0.16	-0.72	-8.48	-8.20	-1.14	-0.02	
Totservs	US\$ 250	11.91	-4.87	2.56	1.02	-6.16	17.62	-5.77	
	US\$ 850	8.76	-3.48	1.54	-2.59	-6.46	8.67	-2.98	
	US\$ 3000	5.52	-2.06	0.50	-6.31	-6.78	-0.54	-0.10	
Grandtot	US\$ 250	27.95	-9.11	4.45	3.73	-5.74	17.13	-2.54	
	US\$ 850	25.24	-9.52	5.02	10.04	10.41	6.11	-2.47	
	US\$ 3000	22.44	-9.93	5.61	16.53	27.04	-5.26	-2.41	

Table 10
Finance of imports of capital goods in large and small countries and by regions (predicted GDP shares).

Pool	Total imports	Total exports	C.a. gap	Merc. surp. except cap. goods imps.	Fac. & non- fac. serv. surplus	Surplus net of cap. goods imps.	Cap. goods imports	Net transfer inflows
\$250	31.21	23.04	8.17	0.03	-2.98	2.95	5.22	3.91
\$850	30.35	24.42	5.93	1.41	-1.86	-0.45	5.48	2.10
\$3000	29.48	25.84	3.64	2.85	-0.72	2.13	5.77	0.24
Large countries								
\$250	21.19	16.32	4.87	1.03	-1.50	-0.47	4.40	3.12
\$850	18.54	14.47	4.07	0.83	-0.96	-0.13	3.94	1.69
\$3000	15.83	12.53	3.30	0.62	-0.42	0.20	3.50	0.22
Small countries								
\$250	36.10	26.12	9.98	-0.48	--3.74	-4.22	5.76	4.35
\$850	37.36	30.05	7.31	1.85	-2.66	-0.81	6.50	1.95
\$3000	38.36	34.29	4.07	4.76	-1.55	3.21	7.28	-0.51
Africa								
\$250	35.57	27.75	7.82	3.18	-5.23	-2.05	5.77	2.12
\$850	41.68	39.18	2.50	-6.59	-8.00	1.41	7.07	-5.63
Asia								
\$250	24.92	20.73	4.19	2.31	-1.82	0.49	4.68	1.90
\$850	36.36	38.31	-1.95	12.85	-2.63	10.22	8.27	0.14
EMENA								
\$850	34.82	23.25	11.57	-5.71	0.64	-5.07	6.50	3.86
\$3000	26.21	18.80	7.41	-3.85	2.58	-1.27	6.14	0.12
LAC								
\$250	24.18	17.05	7.13	0.08	-2.42	-2.34	4.79	4.68
\$850	28.17	24.68	3.49	3.97	-2.56	1.41	4.90	0.38
\$3000	32.27	32.55	-0.28	8.02	-2.72	5.30	5.02	-1.52

7. Regional effects

There are characteristic regional differences in trade volume and composition, as illustrated in tables 9 and 10 for sub-Saharan Africa, Asia outside the Middle East, developing countries in Europe, the Middle East and North Africa (EMENA), and Latin America and the Caribbean (LAC). Regional GDP growth rates, in percent for the period 1964-82, were Africa, 5.1; Asia, 5.6; EMEA, 5.2; LAC, 5.7. When countries are classified by growth performance, the results of section 4 reveal no substantial differences in trade patterns; the results here show that different regions grew at about the same rate, but differ from one another in trade. The trade/growth nexus is not strong.

The general nature of regional trade patterns is illustrated in table 10. Import and export shares of GDP rise with per capita income in all regions but EMEA, with imports lower in LAC – the traditional bastion of import substitution. Countries in sub-Saharan Africa and EMEA are predicted to have larger trade gaps. Deficits on factor and non-factor service trade are larger in Africa than the other regions; as a consequence the African economies' predicted surplus on merchandise trade (apart from capital goods imports) is fairly high. EMEA countries run service surpluses and non-capital merchandise deficits – a pattern reversed from the rest of the developing world's. Africa and EMEA have relatively high shares of capital goods imports; Asia and LAC relatively low.

Table 9 gives detail on trade patterns. At the relevant income levels, sub-Saharan African countries have high import shares for food, textiles, and services; Asia for non-food agriculture, raw materials, and capital goods; EMEA for food. Among exports, Africa shows strong positive deviations for primary products and non-factor services, but is low on textiles and manufactured consumer goods. Asian countries are strong exporters of non-food agricultural products, raw materials, and several categories of manufactures. They are low on non-factor services and high on factor services. EMEA is low on agricultural exports, and high on services. LAC food and oil export shares are high (Venezuela and Trinidad and Tobago at the top of the region's income range).

Elasticities of trade response appear in table 11. Sign differences for responses to changes in per capita GNP between Africa and Asia on the one hand and EMEA and LAC on the other are striking – most shares rise with income in the first two groups and decline in the others. Elasticities of manufactured exports with regard to the real exchange rate are positive everywhere but Asia – are Africa, EMEA and LAC overvalued? Finally, non-oil exports respond positively to real OECD GDP in all regions but Africa. Because of the continent's extreme specialization in primary trade, its overall foreign exchange availability does not rise when the industrial world grows faster.

Table 11
Elasticities with respect to explanatory variables by region.

	Pool	Africa	Asia	EMENA	LAC
GNP per capita					
Manuf. imps.	-0.02	0.14	0.43	-0.11	-0.12
Non-oil imps.	-0.01	0.15	0.32	-0.18	-0.07
Merch. imps.	0.03	0.14	0.36	-0.12	0.13
Fac. and non-fac. serv. imps.	-0.17	0.30	0.50	-0.64	-0.52
Manuf. exps.	0.34	0.20	1.25	0.42	0.01
Non-oil exps.	-0.06	0.41	0.73	-0.02	-0.49
Merch. exps.	0.09	0.53	0.72	-0.11	0.28
Fac. and non-fac. serv. exps.	-0.08	-0.15	0.01	-0.34	-0.93
Effective exch. rate					
Non-oil merch. imps.	0.22	-0.11	0.11	1.09	0.32
Manuf. exps.	0.31	1.18	-0.09	0.97	0.66
OECD GDP					
Non-oil exps.	0.45	-0.21	0.32	0.23	0.60

8. Conclusions

The main conclusions from the pool regressions and sample splits are as follows:

(1) The overall shares of imports and exports of goods and factor and non-factor services in GDP rise with the level of per capita GNP in the pool equations; however, non-oil merchandise and service shares decline. The shares of oil imports and exports consequently rise. Among exports, shares of primary commodities fall and manufactures rise. The share of capital goods imports in GDP goes up with per capita income.

(2) In the pool regressions, the current account trade gap (net of transfers) less the predicted net deficit on factor and non-factor service trade is smaller than imports of capital goods. Hence, the predicted surplus of merchandise exports over non-capital goods imports is positive. Because of their net service trade deficits, most developing countries have to run surpluses on 'current' merchandise trade to pay for imports of capital goods.

(3) Larger countries have lower shares of imports and exports overall. However, shares of most manufactured exports rise with population. Prior import substitution for a larger internal market may be involved.

(4) In the pool regressions, coefficients of primary product and oil exports with respect to capacity utilization are positive – reverse causality may occur in that higher primary product sales abroad lead to greater domestic spending and output. Other export shares of GDP decrease with capacity utilization, i.e., low domestic demand opens a vent for industrial export sales abroad. When capacity use is high, GDP shares of intermediate and capital goods imports go up.

(5) The elasticity of the overall export share with respect to real OECD income is about 0.9, consistent with estimates in other studies.

(6) An increased real effective exchange rate leads to higher trade shares except for primary product exports. For the latter, reverse causality from a high share to a low exchange rate along 'Dutch disease' lines may be involved. The share elasticity of manufactured imports to the real exchange rate is about 0.3, implying a volume elasticity of about -0.7. The non-primary export share elasticity is about 0.3. The numbers imply a modicum of elasticity pessimism, especially for exports.

(7) When the overall 1964-82 time period is split into the sub-periods 1964-73, 1974-77 and 1978-82 the regression equations remain stable, especially the coefficients for per capita GNP and population. The oil import and export shares rise by two or three percent (at different income levels) between the first and last period. Other trade shares typically go up as well, with a mix of price and quantity effects no doubt acting. Toward the end of the period, primary product export shares fall from those of the pool regression, reflecting the decline in the terms of trade that has occurred since the mid-1970s.

(8) Over the sample period, there is a positive association between the GDP growth rate and the level of per capita GNP – richer developing countries grew faster. When the sample is split into high (low) performers with positive (negative) residuals in the regression of growth rate on per capita income, there is no great difference between the two groups in trade shares. The low performers have higher trade shares (by a percent or two overall) and larger gaps on net factor and non-factor service trade. Their capital goods import shares are also higher. The high performers do *not* have higher shares of exports, and their export shares do *not* have higher elasticities with respect to per capita GNP. In either sense, export-led growth does not appear on average, though the low performance countries are a bit more specialized in primary products with low income elasticities of demand in industrialized countries.

(9) When the sample is split into oil exporting and importing economies, the former have a less diversified export basket, have larger trade gaps and capital goods imports, and grow faster. Oil importers need a large surplus of merchandise exports over non-capital, non-oil imports to balance their current accounts, and have trade patterns resembling those of the pool regression.

(10) When the sample is split by population (at 20 million) overall trade shares rise with per capita GNP in small countries and decline in large ones. As noted above, large countries have higher shares of manufactured exports in GDP, despite their less open economies. They have lower capital goods import shares and smaller deficits on net service trade. Hence, large countries rely less than small on a 'current' surplus on commodity trade to pay for imports of investment goods.

(11) When the sample is split regionally into sub-Saharan Africa, developing countries in Europe, the Middle East and North Africa (EMENA), the rest of Asia, and Latin America and the Caribbean (LAC), all four areas grow at about the same rate but their trade patterns differ. EMEA has a net surplus on service trade and a deficit on 'current' merchandise, departing from the developing country norm. Africa has a large service deficit and specialization in primary exports. Asia is more specialized in manufactured exports; LAC has lower import shares. Elasticities of various trade categories with respect to per capita GNP are typically higher in Asia and Africa than EMEA and LAC. In line with the pattern of specialization, manufactured exports are elastic with respect to the real exchange rate everywhere but Asia.

If the regressions have a moral, it is that developing economies *are* constrained by commodity and service trade. But the fetters are not murderously tight; the R^2 values are well under 100 percent. Room for maneuver exists around the common trade patterns; the policy problem is how to exploit the degrees of freedom that exist. These are conclusions which Carlos Diaz would have approved. He would have gone on to make prescient suggestions about which policy lines would make sense in a given historical and institutional context. No one else now seems able to draw the lessons that Carlos could. In that sense, his absence is his survivors' enormous loss.

Appendix

Table A.1
Sample panel of countries.^a

Country	Grouping in analysis											
	1982 GNP per capita (US\$) ^b	1982 pop. in millions	Growth rate GDP 1964-82 ^c	Population ^d	Region ^e	Performance ^f	Income group ^g	Income/ performance ^h	Performance/ population ⁱ	Oil exporters/ importers ^j	Debt status ^k	Debt/oil ^l
Algeria	2110	2200	20.3	6.5	H	C	H	HH	HH	X	H	X
Argentina	1873	2520	28.6	2.8	H	D	L	HL	HL	M	H	M
Bangladesh	121	140	91.6	2.7	H	B	L	LL	LH	M	L	
Brazil	2126	2310	122.7	7.0	H	D	H	HH	HH	M	H	M
Burkina Faso	185	210	6.5	3.1	L	A	L	LL	LL	M	L	
United Republic of Cameroon	691	850	8.9	5.4	L	A	H	LH	HL	X	L	
Central African Republic	276	310	2.4	2.1	L	A	L	LL	LL	M	L	
Chile	1921	2210	11.5	2.1	L	D	L	HL	LL	M	H	
Colombia	1418	1470	27.0	5.5	H	D	H	HH	HH	M	L	
Congo	1182	1180	1.7	6.0	L	A	H	HH	HL	M	L	
Costa Rica	958	1260	2.4	5.5	L	D	H	HH	HL	M	L	
Cyprus	3343	3740	0.6	5.1	L	C	L	HL	LL	M	L	
Dominican Republic	1309	1400	5.8	6.5	L	D	H	HH	HL	M	L	
Ecuador	1610	1210	8.9	7.6	L	D	H	HH	HL	X	L	
Egypt	777	680	44.3	5.8	H	C	H	LH	HH	X	L	
El Salvador	711	740	4.8	3.4	L	D	L	LL	LL	M	L	
Ethiopia	111	140	32.6	3.2	H	A	L	LL	LL	M	L	
Ghana	2621	350	12.2	0.9	L	A	L	LL	LL	M	L	
Greece	3960	4284	9.8	5.2	L	C	L	HL	LL	M	L	
Guatemala	1118	1130	7.7	5.3	L	D	H	HH	HL	M	L	
Honduras	658	670	4.0	4.2	L	D	L	LL	LL	M	L	
India	236	250	705.7	3.6	H	B	L	LL	LH	M	L	
Indonesia	572	580	152.6	7.7	H	B	H	LH	HH	X	L	
Ivory Coast	744	1140	8.8	6.0	L	A	H	HH	HL	M	L	
Jamaica	1390	1350	2.2	1.3	L	D	L	HL	LL	M	L	
Jordan	1226	1860	3.5	9.4	L	C	H	HH	HL	M	L	
Kenya	330	390	18.1	6.5	L	A	H	LH	HL	M	L	
Korea, Republic of	1801	1760	39.6	8.0	H	B	H	HH	HH	M	L	
Madagascar	299	320	9.2	1.4	L	A	L	LL	LL	M	L	
Malawi	194	210	6.5	5.5	L	A	H	LH	HL	M	L	
Malaysia	1718	1840	14.5	7.0	L	B	H	HH	HL	X	L	
Mali	146	180	7.1	3.8	L	A	H	LH	HL	M	L	
Mexico	2164	2250	73.1	6.7	H	D	H	HH	HH	X	L	

Table A.1 (continued)

Country	Grouping in analysis											
	1982 GNP per capita (US\$) b	1982 pop. in millions	Growth rate GDP 1964-82 ^c	Population ^d	Region ^e	Performers ^f	Income group ^g	Income/ performance ^h	Performance/ population ⁱ	Oil exporters/ importers ^j	Debt status ^k	Debt/oil ^l
Morocco	746	820	21.6	5.2	H	C	H	LH	HH	M	H	M
Nicaragua	981	900	2.9	2.3	L	D	L	LL	LL	M	L	
Niger	255	310	5.9	1.7	L	A	L	LL	LL	M	L	
Nigeria	833	820	90.6	6.0	H	A	H	LH	HH	X	L	
Pakistan	374	380	87.0	5.2	H	B	H	LH	HH	M	L	
Peru	1198	1250	17.5	3.3	L	D	L	HL	LL	X	L	
Philippines	774	820	50.7	5.6	H	B	H	LH	HH	M	H	
Portugal	2207	2490	9.9	5.0	L	C	L	H	LL	M	L	
Senegal	409	440	6.0	2.5	L	A	L	LL	LL	M	L	
Spain	4714	5328	38.5	4.4	H	C	L	H	LH	M	L	
Sri Lanka	310	320	15.2	4.5	L	B	H	L	HL	M	L	
Sudan	370	460	19.8	4.2	L	A	L	LL	LL	M	L	
United Republic of Tanzania	254	280	19.3	4.5	L	A	H	LH	HL	M	L	
Thailand	735	800	48.5	7.1	H	B	H	LL	LH	M	L	
Togo	292	350	2.8	4.0	L	A	L	LL	LL	M	L	
Trinidad and Tobago	6466	6450	1.2	4.6	L	D	L	H	LL	M	L	
Tunisia	1227	1370	6.7	6.8	L	C	H	H	HH	M	L	
Turkey	1160	1330	47.5	5.5	H	C	H	H	HH	M	H	
Uruguay	3089	2650	2.9	2.6	L	D	L	H	HL	M	L	
Venezuela	3971	3229	15.9	4.6	L	D	L	H	LL	X	H	
Yugoslavia	2693	2840	22.7	5.6	H	C	H	H	HH	M	L	
Zambia	595	580	6.0	4.0	L	A	L	L	LL	M	L	

^aSource: Economic Analysis and Projections Department, Data Bank.

^bGNP per capita using Atlas method.

^cExcept for Cyprus, Ecuador, Indonesia, Jordan and Trinidad and Tobago.

^dHigh and low (H and L) correspond to countries with 1982 populations greater than 20 million and less than 20 million, respectively.

^eThe four regions are Africa (A), Asia (B), Europe, the Middle-East and North Africa (C) and the Caribbean and South American countries (D).

^fBased on regressing 1964-82 GDP growth rate on the log of per capita GNP for 1982. Observations below the regression line have been classified low growth performers (L), and those above it high growth performers (H).

^gHigh and low (H and L) correspond to countries with 1982 per capita GNP greater than \$1000 and less \$1000. Atlas GNP was used for the country selections while GNP per capita at market exchange rates was used for the regression analysis.

^hThe high and low performers were further subdivided according to their income levels, high or low as in footnote g. The first letter indicates performance and the second letter income.

ⁱThe high and low performers were subdivided on the basis of their population size as in footnote b. The first letter indicates performance and the second letter population.

^jThe oil exporters group (denoted X) comprises those countries classified as middle-income oil exporters in the 1984 *World Development Report*. The remaining countries are classified as oil importers (denoted M).

^kThe high debt countries comprise Algeria, Argentina, Brazil, Chile, Egypt, India, Indonesia, Korea, Mexico, Morocco, Philippines, Turkey and Venezuela, and are denoted H. The remaining countries are classified as low debt countries, denoted L.

^lThe high debt group was classified according to its oil exporter/importer status, denoted X and M.

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