PATTERNS OF DEVELOPMENT, 1970–1994

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Abstract

The paper characterizes the patterns of development based on 93 countries over the last 25 years (1970–94). It starts with a brief review of the literature in this area and then provides operational definitions of development and economic structure. Economic structure is defined by 45 macroeconomic indicators, such as sectoral shares of GDP, trade intensity, or financial market development. After discussing some of the main methodological issues, the empirical analysis shows that systematic relationships exist between the level of GDP per capita and 33 macroeconomic indicators. The paper concludes with some implications for the growth literature and some warnings on how not to interpret patterns of development.

JEL classification: O1

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I. Introduction: The Importance of Economic Structure

The idea that economic structure matters for the macroeconomics of developing countries achieved great importance through the seminal work of Lewis (1954); the many contributions of Simon Kuznets, Hollis B. Chenery, and Moshe Syrquin; and especially the contributions of Lance Taylor.[1] The relevance of economic structure for investment and growth has been touched on by Cooper (1971), Krugman and Taylor (1978), Branson (1983), Katseli (1983), and others.[2] The relevance of financial structure has been stressed by Goldsmith (1969), Stiglitz (1988), and many more recent contributions, especially by Ross Levine.[3] The importance of economic structure is becoming clear in the recent work of institutional economics. But beyond the new institutional literature, even traditional areas, such as tax policy, are geared to understanding differences in economic structure. For example, Tanzi (1993) has stated that "differences in tax levels and in tax structure between industrial and developing countries are probably explained more by differences in economic structure than by differences in policies."[4] In other words, that economic structure matters for development is a well-established fact.

A good summary of differences in economic structure can be found in the textbook *Development Macroeconomics* by Agénor and Montiel (1996). Agénor and Montiel justify their textbook by arguing that "the structural differences that differentiate a 'representative' developing economy from the textbook industrialized model cover a wide spectrum."[5] Agénor and Montiel go beyond the usual definition of "economic structure" by including differences in exchange rate systems, economic policies, institutional features, and behavioral relationships. Regarding the more traditional structural features of an economy, Agénor and Montiel (1996) conclude that developing countries tend to be capital importers and have, in contrast to industrialized countries, larger government sectors. They depend more on imported intermediate goods and have less-developed financial markets. Agénor and Montiel (1996) also provide evidence for the case that developing nations tend to be substantially more open than the seven major industrialized countries, when openness is defined as the sum of import and export shares to GDP. One of the questions that will be addressed below is whether this holds true after also including smaller industrialized countries in the comparison. In other words, is there a systematic relationship between trade intensity and the level of development?

The goal of this paper is to establish simple stylized facts on relationships between

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[1] See Gunter (1998) for a detailed review of the previous pattern of development literature.

[2] For example, Branson (1983) provided a variety of less-developed countries' trade structures in terms of elasticities of demand and supply for exports and imports that differ from the assumptions of the monetary model and imply stagflationary effects of devaluations.

[3] See Levine (1997) for a recent review of literature related to financial market development.

[4] Tanzi (1993), pp. 35–36.

[5] Agénor and Montiel (1996), p. 16.

development and economic structure based on the experience of ninety-three countries for which a critical mass of data was available from 1970 to 1994.[6] Although we are interested in showing that differences in economic structure between richer and poorer countries remain relevant, we are not interested in determining either the causality or the source of these differences. As Chenery and Syrquin (1975) have pointed out, the income level incorporates other factors determining economic structure in a single income effect. This is especially the case after controlling for economies of scale. Furthermore, the precise relationship between development and economic structure is irrelevant for our purpose, as long as a relationship can be established with sufficient evidence.[7]

As Chenery and Syrquin (1975) pointed out, "a development pattern may be defined as a systematic variation in any significant aspect of the economic or social structure associated with a rising level of income or other index of development."[8] This paper examines simple development patterns along the definition of Chenery and Syrquin. There are obviously many problems in analyzing the theoretically indefinite number of relationships between the level of development and economic structure. An initial problem is related to the definitions of development and economic structure. There is no accepted definition of either development or economic structure. The more accurate a definition is from a theoretical point of view, the more difficult it becomes for practical purposes to find comparable data across countries and time. Furthermore, a large number of problems relate to the research methodology. Some of these methodological complications are due to the fact that the causality may run in both directions, most of the time-series data may not be stationary or cointegrated, development is determined by many highly correlated structural variables, and development is certainly influenced by economic policies, institutional characteristics, and cultural differences, all of which are basically impossible to quantify.

We concentrate solely on the analysis of economic structure and make little reference to economic policies. We neglect economic policies simply because we are interested in the patterns of development in the form of economic structure. The quantification of policies would raise more questions than it would answer for our purpose. In reality, policies and economic structure are both relevant for development; the relative importance of policies compared with structure depends on *(a)* the degree to which good or bad policies have been applied, *(b)* the prevailing economic structure of the country, and *(c)* the specific topic under consideration.

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[6] Please see appendix 1 for the list of these ninety-three countries and further explanations.

[7] For example, the relationship may be stronger at a low level of income and less strong at high levels of income. The estimators of our regressions do not have to be the best linear unbiased estimators (BLUE), because they are not supposed to be used for any prediction or forecasting. Furthermore, we have limited our analysis to the testing of a linear, log-linear, or quadratic relationship and a limited number of exogenous variables in each regression. If none of these three relationships can be established, no simple relationship exists. The nonexistence of a simple relationship should not be interpreted as indicating that no relationship exists at all.

[8] Chenery and Syrquin (1975), p. 4.

The remainder of the paper is structured as follows. The next section will define development and economic structure as it is appropriate for the examination of development patterns. Section III will discuss the main methodological issues. Empirical results will be presented in section IV. The last section will conclude with some implications for the growth literature and future research.

II. Defining Economic Development and Economic Structure

1. Defining Economic Development

No perfect indicator exists for the level of development at the national level nor among countries at the international level. The usual measure in the patterns of development literature is either real GDP per capita or real GNP per capita, either based on nominal exchange rates or purchasing power parity–adjusted exchange rates. Income per capita has well-known limitations as a measure of development. Income per capita excludes nonmarket transactions; it says nothing about the distribution of income, and it does not take into account environmental pollution or degradation, the loss of natural resources, or changes in the quality of life. Furthermore, it is not without statistical and measurement problems.

Many more comprehensive indicators of development now exist, for example, the Human Development Index (HDI) of the United Nations Development Programme (UNDP) and the Overseas Development Council's Physical Quality of Life Index (PQLI). However, problems remain, particularly those related to *(a)* consistency in the definition of these composite indicators, *(b)* availability of these variables over a long period, and *(c)* likely correlation of any composite index with structural variables. Therefore, it is still more appropriate to use real GDP per capita for the purpose of analyzing patterns of development. To control for differences in purchasing power, we generally use purchasing power–adjusted real GDP per capita (Y)[9] as the level of development. However, we will also use non–purchasing power–adjusted real GDP per capita (Z) in one of the specifications for each structural variable under consideration for reasons of comparison.

2. Defining Economic Structure

The term "economic structure" is generally used for a wide variety of characteristics of an economy. The most traditional measures of economic structure are sectoral shares of the labor force, consumption patterns, and variables measuring income distribution. All three categories have been analyzed in Clark (1951). Kuznets' "Quantitative Aspects of the Economic Growth of Nations" in *Economic Development and Cultural Change* (various issues) examined these three categories in more detail and added the analysis of sectoral shares of GDP and some trade-related variables. Chenery and Syrquin (1975) have added five more categories of variables: investment, government revenues, education, urbanization, and demographic transition, which amount to a total of twenty-seven economic and social variables. Considerable problems exist that are related

[9] A country's real GDP per capita, adjusted for differences in purchasing power, is taken from the World Penn Data set, also called the Summers/Heston data set. For a detailed description of this data set, see Summers and Heston (1991).

to the data quality of social variables. The problem related to the quality of social data is also reflected in limited data availability. Chenery and Syrquin (1975) had more than 1,000 observations for many of their macroeconomic variables, although they only had 213 observations for the birth and death rates and 66 observations for each their two income distribution variables.

In addition to the social variables included in Chenery and Syrquin (1975), a wide variety of other social and institutional characteristics, which are sometimes included in the term "economic structure," now exists. Examples are fertility rates, central bank independence, and institutional development. For many of these social and institutional variables, data quality and availability have improved considerably in the past twenty years.[10] However, compared to most of the macroeconomic variables, considerable gaps still exist in the quality and availability of social and institutional variables. Given these data constraints, we have excluded all the and other social and institutional characteristics. Instead of relying on debatable social and institutional variables, we have chosen to concentrate on macroeconomic variables. However, as in the case of economic policy, the interpretation should not be that social and institutional characteristics have no impact on development.

Given the constraints of data availability, we have limited the analysis to forty-five macroeconomic variables as listed in table 1. These variables characterizing economic structure are grouped into ten areas of considerations: *(a)* the sectoral composition of output, *(b)* shares of investment to GDP, *(c)* shares of savings and consumption to GDP, *(d)* shares of government expenditures and revenues to GDP, *(e)* inflation and money supply, *(f)* overall trade- and import-related variables, *(g)* export-related variables, *(h)* export product concentration, *(i)* market power in world export markets, and *(j)* financial market development. Our forty-five variables represent probably one of the most extensive analyses of economic structure in a worldwide cross-country analysis. All definitions are explained in more detail in appendix 2.

[10] For example, recently, new data sets on school enrollment (Barro and Lee [1996]) and income inequality (Deininger and Squire [1996]) have been assembled.

Table 1: Variables Characterizing Economic Structure

Area/Variable	Acronym	Observations
1. Sectoral Composition of Output		
a. Share of agriculture in GDP (in %)	AGRI	2,044
b. Share of industry in GDP (in %)	INDUS	2,032
c. Share of manufacturing in GDP (in %)	MANU	1,907
d. Share of services in GDP (in %)	SERVICE	2,032
2. Investment Shares in GDP (as % of GDP)		
a. Gross domestic investment	INVES	2,274
b. Gross domestic fixed investment	INVFI	2,072
c. Domestic fixed private investment	INVFIPR	1,011
d. Domestic fixed public investment	INVFIPU	875
3. Consumption and Savings (as % of GDP)		
a. Total consumption	CONS	2,273
b. Private consumption	CONSPR	2,249
c. General government consumption	CONSGO	2,219
d. Gross domestic savings	SAVI	2,273
4. Government Expenditures and Revenues		
a. Total government expenditure (as % or GDP)	GOVEXP	1,566
b. Total revenue (as % or GDP)	GOVREV	1,591
c. Tax revenue (as % or GDP)	GOVTAX	1,595
d. Fiscal deficit (as % or GDP)	FISDEF	1,523
5. Inflation and Money Supply		
a. Inflation rate (%) based on GDP deflator	INFGDP	2,321
b. Inflation rate (%) based on CPI	INFCPI	2,070
c. Money supply M1 (as % of GDP)	MON	2,209
d. Annual growth rate of M1 (%)	MONGR	2,209
e. Money supply M2 (as % of GDP)	MONB	2,168
f. Annual growth rate of M2 (%)	MONBGR	2,168
6. Overall Trade and Import Variables		
a. Current account balance (as % of GDP)	CUAB	2,244
b. Capital account balance (as % of GDP)	CAAB	2,174
c. Sum of exports and imports (as % of GDP)	OPEN	2,265
d. Total imports (as % of GDP)	IMPPER	2,272
e. Merchandise imports (as % of GDP)	IMPMER	2,267

(Table 1 continues on next page.)

Table 1 (continued)

7. Export Variables			
a. Total exports (as % of GDP)		EXPPER	2,274
b. Merchandise exports (as % of GDP)		EXPMER	2,273
c. Exports of machinery (as % of GDP)		EXPMACH	585
d. Exports of machinery (as % of total exports)		EXPMACHEX	585
e. Primary exports (as % of GDP)		EXPPRIM	630
f. Primary exports (as % of total exports)		EXPPRIMEX	630
8. Export Product Concentration (as % of total exports, TE)			
a. Share of the major export good in TE		EX1EX	1,922
b. Share of the second major export good in TE		EX2EX	1,922
c. Share of the third major export good in TE		EX3EX	1,922
d. Export product concentration index (= EX1EX + EX2EX + EX3EX)		EXSEX	1,922
9. Market Power in World Export Markets (as % of the world's export in that good, WE)			
a. Share of the major export good in WE		EX1W	1,922
b. Share of the second major export good in WE		EX2W	1,922
c. Share of the third major export good in WE		EX3W	1,922
d. Index of market power in WEs (= EX1W + EX2W + EX3W)		EXSW	1,922
10. Financial Market Development			
a. The ratio of liquid liabilities of the financial system to GDP	FIN1	2,222	
b. The ratio of deposit money bank domestic assets to deposit money bank domestic assets plus central bank domestic assets	FIN2	2,166	
c. The proportion of credit allocated to private enterprises by the financial system	FIN3	2,231	
d. The ratio of claims on the nonfinancial private sector to GDP		FIN4	2,222

III. Tools of Analysis

1. Scatter Diagrams and Country Group Averages

Following the original contributions by Clark and Kuznets, we first analyze scatter diagrams and country-group averages, which familiarize us with general characteristics of the data. The four country groups are based on the 1996 World Development Report's classification of low-income, lower-middle-income, upper-middle-income, and high-income countries. Among the 93 countries included in our analysis, the low-income group contains 39 countries, the lower-middle-income group contains 22 countries, the upper-middle-income group contains 11 countries, and the high-income group contains 21 countries. These differences in numbers across country groups reflect the relative size of these country groups and should not be interpreted as a possible source of a country selection bias.[11]

2. Cross-Country Regression Analysis

Even though the conclusions based on cross-country regressions are often limited, they are sufficient and convenient for our purpose. Most time series data are generally not stationary, and the use of time series data has become a controversial and complicated issue. For example, although it is common practice to take first differences to remove most of the trend, this has led to increased criticism that first differencing implies an important loss of information. Furthermore, the method of first differencing is certainly unacceptable for the estimation of patterns of development, because first differencing would turn the pattern of development analysis into a growth analysis. Given this situation and the limited goal of this paper, we limit the analysis to a variety of cross-country regressions, using averages of annual data from 1970–94.

The variety of specifications for all structural variables under consideration is adapted from the principal specification of Chenery and Syrquin (1975) and of Syrquin and Chenery (1989):

$$\ln X = \gamma_1 + \gamma_2 \ln Y + \gamma_3 (\ln Y)^2 + \gamma_4 \ln N + \gamma_5 (\ln N)^2 + \gamma_6 F$$

where

- X is the dependent variable, usually taken as a ratio to GDP
- Y is the income level measured as GNP per capita
- N is the country's population
- F is the net resource inflow, measured as imports minus exports of goods and nonfactor services as a share of total GDP.

Although the inclusion of linear and nonlinear income and country-size terms in one equation raises questions about multicollinearity and parameter interpretation, these terms are meant to capture an upper and lower asymptote. The upper asymptote reflects the industrialized

[11] For example, excluding economies with populations of fewer than one million, fourteen upper-middle-income countries exist, excluding the Czech Republic, Hungary, and Slovenia. Data were available for eleven of these fourteen upper-middle-income countries.

countries' experience of a period of fairly rapid change followed by deceleration. The lower asymptote reflects the case of many upper-middle-income developing countries experiencing a period of accelerated structural change after an initial stage of stagnation.

Although we will use Chenery and Syrquin's (1975) set of explanatory variables, we modify their regression specification. Instead of using one regression specification, we will use a consistent set of different specifications (please see table 2 below), allowing for different combinations of explanatory variables but without running into problems related to multicollinearity. For example, the regression specifications will include the explanatory variables Y and Y^2, although not in any one specification.

It is interesting to note that, although N was supposed "to allow for effects of economies of scale and transport costs on patterns of trade and production,"[12] N is defined as the country's population but not as the country's size in terms of land area or as a country's population density. Later studies, such as Syrquin and Chenery (1989) and even the analysis of trade patterns by McCarthy, Taylor, and Talati (1987), have continued to use population as the variable controlling for country size or effects of economies of scale. Although we continue to use population as an explanatory variable in some of our regression specifications, we have also substituted population density (D) for population in other specifications, because population density is, from a theoretical point of view, a better proxy for economies of scale than population by itself.

In addition to population or population density, we also add a country's land area as an explanatory variable in trade equations in which the endogenous variable is defined as a ratio of GDP. The same applies to the regressions estimating export variables, expressed as shares of world exports. In cases in which the endogenous trade variables are defined as percentages of total imports or total exports, it will not be necessary to add the country's land area as an additional explanatory variable because a country's land area is introduced only to take care of the fact that large countries tend to trade less than smaller countries. By defining a trade variable as a share of another trade variable, whether a country's trade share is large or small is already taken into account, whatever the reason may be. The definition of a trade share in total trade is, therefore, more appropriate than defining a trade share in GDP and then controlling for country size.

Following McCarthy, Taylor, and Talati (1987), the net resource flow (F) has been excluded as an explanatory variable from all equations with trade shares as endogenous variables. This makes sense because F is basically the same as the capital account balance and, thus, more or less the negative of the current account balance. Similarly, in countries where exports are highly concentrated in one good, the net resource flow is closely related to changes in exports of this good. In other words, in countries with a high export concentration in one good, F cannot be considered exogenous to the share of the major export good. Even though this may only be the case for a few countries, it is better not to include F as an exogenous variable in the equations explaining export product concentration with the major export good.

[12] Chenery and Syrquin (1975), p. 17.

Based on the results of the scatter diagram and the country group averages, we have generally chosen a log-linear specification.[13] We have also, however, considered linear and nonlinear (U-shaped or inverse U-shaped) relationships, none of which turned out to be more significant than the log-linear specification.

3. Robustness

The various tools of analysis, especially the many different specifications of the regression analysis (see table 2 below), provide a considerable basis for evaluating the robustness of the results related to the relationship between economic structure (X) and the level of development (Y). We are especially interested in the value and sign of the t-statistic of β, because β is the estimated coefficient for GDP per capita. For a regressor to be considered significant we have required the usual significance level of 95%. Of some interest are also the coefficients of determination (the R^2s). Based on the F-statistic, it is possible to determine a threshold level of R^2, which indicates whether a coefficient of determination is "high" or "low." Depending on the specific regression specification, this threshold R^2 is between 0.07 and 0.08 for a 99% significance level.

4. General Problems Related to Hypothesis Testing

As is well known, the possibility for two kinds of errors always exists in testing a hypothesis. One is that a hypothesis can be true even though the empirical results do not support the hypothesis, the so-called error of type 1 (or A). Because the main objective of this analytical part is to show that economic structure matters, there is little reason to worry about possible errors of type 1. The goal here is to establish some simple stylized facts.

The other type of error is that a hypothesis can be wrong even though the empirical results support the hypothesis (the so-called error of type 2 or B). The paper tries to minimize the possibility for errors of type B, not only by using data from ninety-three countries during a time period of twenty-five years, but also by requiring consistency of the results from the various tools and specifications.

[13] In three cases in which the endogenous variable can take on positive as well as negative values (fiscal deficit, current account balance, and capital account balance), we use a semi-log specification.

Table 2: Regression Specifications

The eight basic regression specifications are:

loglin1: $\ln X = \alpha + \beta \ln Z$

loglin2: $\ln X = \alpha + \beta \ln Y$

loglin3: $\ln X = \alpha + \beta \ln Y + \gamma \ln N$

loglin4: $\ln X = \alpha + \beta \ln Y + \gamma \ln D$

loglin5: $\ln X = \alpha + \beta \ln Y + \gamma \ln N + \delta F$

loglin6: $\ln X = \alpha + \beta \ln Y + \gamma \ln D + \delta F$

loglin7: $\ln X = \alpha + \beta (\ln Y)^2 + \gamma (\ln N)^2$

loglin8: $\ln X = \alpha + \beta (\ln Y)^2 + \gamma (\ln D)^2$

where

- X is the dependent variable, usually taken as a ratio to GDP
- Y is the purchasing-power–adjusted real GDP per capita
- Z is the non-purchasing-power–adjusted real GDP per capita
- N is the country's population
- D is population density (population/square kilometers)
- F is the net resource inflow measured as imports minus exports of goods and nonfactor services as a share of total GDP.

In cases in which X can take on positive and negative values, the eight regression specifications are the semi-log analog specifications. In cases in which X is a trade share to GDP, specifications five and six are excluded from the analysis. On the other hand, we will add country size (CS) to these regressions to control for country size. The six relevant regression specifications for variables of trade shares to GDP are, therefore, as follows:

loglin1': $\ln X = \alpha + \beta \ln Z + \mu \ln CS$

loglin2': $\ln X = \alpha + \beta \ln Y + \mu \ln CS$

loglin3': $\ln X = \alpha + \beta \ln Y + \gamma \ln N + \mu \ln CS$

loglin4': $\ln X = \alpha + \beta \ln Y + \gamma \ln D + \mu \ln CS$

loglin7': $\ln X = \alpha + \beta (\ln Y)^2 + \gamma (\ln N)^2 + \mu \ln CS$

loglin8': $\ln X = \alpha + \beta (\ln Y)^2 + \gamma (\ln D)^2 + \mu \ln CS$

where X, Y, Z, N, and D are defined as above and CS is country size in square kilometers (km^2).

IV. Empirical Results

The organization of this section follows the ten areas of economic structure. After presenting the results of the patterns of development from 1970–94 by topic and variable in the first ten sections, the last section will summarize the results in the form of stylized facts. However, to avoid repeating similar results in each of the ten subsections, it is appropriate to outline some general results. First, most of the results are consistent across various tools of analysis. For example, significant parameters (βs) are associated both with high values of coefficients of determination (R^2s) from the cross-section regressions and high correlation coefficients from the panel data. Second, the values and significance of the income parameters (βs) are generally consistent across the eight different specifications. Third, the results are consistent across structural variables. For example, the positive relationship between the level of development and the share of manufacturing in GDP is consistent with the result that less-developed countries' shares of machinery exports are lower than the shares of industrialized countries.

The group averages for each of the forty-five structural variables are provided in table 3. In addition, table 3 shows the parallel between clear trends of country group averages and relatively high correlation coefficients of the panel data. To recognize the trends based on group averages in table 3 more easily, variables with a consistently positive trend are underlined, variables with a consistently negative trend are shown in **boldface,** and variables without a clear trend appear in *italics.* Table 4 provides the t-statistics, significance levels, and the range of R^2s of the 336 regressions (details are available from the authors on request).

1. Sectoral Composition of Output

Results of earlier studies demonstrated that the share of agriculture decreases and that the shares of industry, manufacturing, and services increase as development proceeds. All tools of analysis (scatter diagrams, group averages, regressions, and correlation coefficients of panel data) confirm these relationships. The results of the eight log-linear regression specifications are especially strong, because they provide always significant βs (income parameters) at the 99% level. The coefficients of determination vary between 0.81 and 0.83 for the regressions related to the share of agriculture and between 0.33–0.43, 0.25–0.45, and 0.47–0.52 for the shares of industry, manufacturing, and services, respectively. However, two qualifications seem to be appropriate. The first one relates to the role of outliers, and the second refers to the possibility of an inverse U-shaped relationship.

Table 3: Group Averages and Panel Data Correlations

Structural variable	Low-income	Lower-middle-income	Upper-middle-income	High-income	Correlation coefficient (panel)
AGRI	**36.63**	**19.24**	**12.68**	**4.56**	**-0.595**
INDUS	21.71	31.72	35.21[1]	35.00[2]	0.458
MANU	11.81	16.44	20.87	22.51	0.371
SERVICE	41.66	49.04	50.61[1]	57.78[2]	0.409
INVES	19.37	24.02	24.45	24.33	0.350
INVFI	18.10	22.32	23.60	23.59	0.407
INVFIPR	9.30	14.49	17.09	28.03	0.466
INVFIPU	*9.01*	*7.61*	*6.36*	*9.99*	*0.013*
CONS	**92.06**	**79.65**	**77.84[1]**	**76.03**	**-0.289**
CONSPR	**78.35**	**66.20**	**59.32**	**58.87**	**-0.387**
CONSGO	*14.18*	*13.45*	*14.00*	*17.15*	*0.282*
SAVI	7.95	20.32	22.32[1]	24.06	0.289
FISDEF	*-5.19*	*-2.73*	*-4.67*	*-3.95*	*0.067*
GOVEXP	*23.57*	*21.82*	*25.83*	*33.16*	*0.288*
GOVREV	16.79	19.34	22.52	30.79	0.517
GOVTAX	13.96	15.41	18.89	27.59	0.584
INFGDP	*53.94*	*59.29*	*105.97*	*7.28*	*-0.041*
INFCPI	*84.78*	*67.18*	*99.73*	*7.41*	*-0.049*
MON	*18.51*	*18.22*	*13.60*	*23.31*	*0.104*
MONGR	*10.24*	*10.51*	*12.84*	*12.00*	*0.017*
MONB	29.55	36.35	41.68	72.04	0.535
MONBGR	*11.50*	*13.75*	*17.45*	*12.46*	*0.020*
CUAB	-11.92	-5.15	-1.98	-1.11	0.335
CAAB	**5.53**	**3.26**	**2.12**	**1.09**	**-0.173**
OPEN	*60.07*	*70.41*	*66.36*	*82.13*	*0.125*
IMPPER	*36.55*	*38.15*	*34.09*	*41.75*	*0.046*
IMPMER	*24.37*	*25.07*	*21.14*	*29.94*	*0.037*
EXPPER	23.74	31.88	32.26	40.37	0.192
EXPMER	17.13	22.11	25.38	27.81	0.178
EXPMACH	0.24	1.07	2.50	8.73	0.424
EXPMACHEX	1.35	3.89	8.03	21.57	0.737
EXPPRIM	*13.35*	*14.08*	*18.35*	*9.34*	*-0.184*
EXPPRIMEX	**53.54**	**51.93**	**51.45**	**22.57**	**-0.504**

(Table 3 continues on the next page.)

Table 3 (continued)

Structural variable	Low-income	Lower-middle-income	Upper-middle-income	High-income	Correlation coefficient (panel)
EX1EX	**46.15**	**37.52**	**31.59[3]**	**14.73**	**-0.414**
EX2EX	**16.85**	**16.12**	**11.24**	**8.05**	**-0.382**
EX3EX	**9.15**	**9.10**	**6.71**	**5.93**	**-0.269**
EXSEX	**72.15**	**62.73**	**54.47**	**28.72**	**-0.518**
EX1W	5.13	5.95	8.08[3]	9.83	0.155
EX2W	2.78	4.31	7.22	13.82	0.368
EX3W	2.42	2.98	6.68	12.90	0.301
EXSW	10.33	13.24	23.71	36.55	0.386
FIN1	0.27	0.33	0.36	0.64	0.606
FIN2	0.59	0.64	0.69	0.89	0.493
FIN3	0.62	0.72	0.73	0.81	0.109
FIN4	0.18	0.23	0.29	0.59	0.693

Notes:

1 After excluding Gabon and Saudi Arabia, which, because of their large oil industries, have far too high industry shares, too low service shares, too low consumption shares, and too high savings shares, compared with any other upper-middle-income country.

2 After excluding Ireland, which has an industry sector of 9.9% and a service sector of 81.22% (please see the explanation in footnote 15).

3 After excluding Saudi Arabia, whose share of oil exports in total exports is more than 85% and constitutes 27.10% of the world’s oil exports.

Table 4: Empirical Results of the Structural Regressions
(t-statistics, significance, and range of R^2s)

Structural variable	t - s t a t i s t i c s a n d s i g n i f i c a n c e								Range of adjusted R^2 (Min-Max)
	loglin1	loglin2	loglin3	loglin4	loglin5	loglin6	loglin7	loglin8	
agri	-20.10 ***	-19.73 ***	-19.47 ***	-19.43 ***	-14.40 ***	-14.81 ***	-20.17 ***	-20.19 ***	0.80–0.82 ***
indus	6.70 ***	7.39 ***	7.18 ***	7.60 ***	4.49 ***	4.58 ***	6.90 ***	7.19 ***	0.32–0.42 ***
manu	5.57 ***	6.32 ***	6.28 ***	6.13 ***	5.87 ***	4.64 ***	6.18 ***	5.89 ***	0.25–0.43 ***
service	9.20 ***	8.99 ***	9.48 ***	8.77 ***	8.00 ***	8.41 ***	9.37 ***	8.61 ***	0.46–0.50 ***
inves	3.68 ***	3.89 ***	3.96 ***	3.88 ***	4.79 ***	4.81 ***	3.77 ***	3.65 ***	0.12–0.19 ***
invfi	4.33 ***	4.59 ***	4.60 ***	4.51 ***	4.86 ***	4.88 ***	4.40 ***	4.25 ***	0.16–0.21 ***
invfipr	5.64 ***	5.18 ***	5.13 ***	5.13 ***	4.33 ***	4.53 ***	5.02 ***	4.66 ***	0.28–0.34 ***
invfipu	-1.84	-1.74	-1.73	-1.70	-0.66	-0.92	-1.62	-1.64	0.01–0.05
cons	-7.06 ***	-7.10 ***	-6.89 ***	-7.09 ***	-2.10 **	-2.46 **	-6.69 ***	-6.76 ***	0.32–0.58 ***
conspr	-8.57 ***	-8.15 ***	-8.08 ***	-8.68 ***	-3.72 ***	-4.57 ***	-7.94 ***	-8.33 ***	0.40–0.56 ***
consgo	3.32 ***	2.46 **	3.21 ***	3.12 ***	4.46 ***	5.35 ***	3.36 ***	3.35 ***	0.05–0.31 **
savi	6.20 ***	6.97 ***	6.90 ***	6.91 ***	3.31 ***	3.33 ***	6.61 ***	6.62 ***	0.30–0.43 ***
fisdef	0.95	0.93	0.86	1.01	-2.23 **	-1.89 *	0.93	0.86	0.00–0.17
govexp	4.15 ***	3.52 ***	4.43 ***	3.73 ***	5.99 ***	6.41 ***	4.49 ***	3.83 ***	0.11–0.36 ***
govrev	7.15 ***	6.44 ***	7.35 ***	6.53 ***	6.53 ***	6.94 ***	7.34 ***	6.50 ***	0.31–0.41 ***
govtax	8.30 ***	7.07 ***	8.09 ***	7.13 ***	6.79 ***	7.19 ***	8.19 ***	7.23 ***	0.35–0.45 ***

(Table 4 continues on the next page.)

Table 4 (continued)

structural variable	t-statistics and significance								range of adjusted R^2 (Min-Max)
	loglin1	loglin2	loglin3	loglin4	loglin5	loglin6	loglin7	loglin8	
infgdp	-1.84	-1.34	-1.37	-1.05	-0.43	-0.53	-1.54	-1.11	0.00–0.08
infcpi	-1.93 *	-1.45	-1.51	-1.27	-0.39	-0.60	-1.67	-1.32	0.00–0.06
mon	2.15 **	1.84	1.64	1.66	3.17 ***	2.58 **	1.72	1.73	0.02–0.11
mongr	2.43 **	2.11 **	2.05 **	2.06 **	1.38	1.36	2.07 **	2.04 **	0.01–0.06
monb	8.66 ***	9.24 ***	9.10 ***	9.31 ***	9.71 ***	9.00 ***	9.13 ***	9.11 ***	0.44–0.58 ***
monbgr	1.80	1.84	1.67	1.72	0.65	0.42	1.55	1.53	0.02–0.05
cuab	6.79 ***	7.43 ***	7.90 ***	7.23 ***			7.76 ***	7.02 ***	0.32–0.55 ***
caab	-4.15 ***	-4.44 ***	-4.21 ***	-4.22 ***			-4.29 ***	-4.20 ***	0.14–0.26 ***
open	2.32 **	1.86 *	3.24 ***	3.24 ***			3.24 ***	3.24 ***	0.31–0.53 ***
impper	0.65	0.17	1.37	1.37			1.29	1.30	0.32–0.57 ***
impmer	0.52	0.24	1.02	1.02			1.02	0.97	0.39–0.54 ***
expper	4.25 ***	3.81 ***	5.07 ***	5.07 ***			4.86 ***	4.70 ***	0.32–0.47 ***
expmer	3.83 ***	3.25 ***	4.42 ***	4.42 ***			4.23 ***	3.99 ***	0.21–0.39 ***
expmach	10.02 ***	9.49 ***	9.32 ***	9.32 ***			9.54 ***	9.39 ***	0.50–0.55 ***
expmachex	8.13 ***	7.95 ***	8.27 ***	7.77 ***			8.50 ***	7.89 ***	0.41–0.52 ***
expprim	-1.60	-1.69	-1.13	-1.13			-1.35	-1.08	0.02–0.38
expprimex	-5.62 ***	-5.37 ***	-5.26 ***	-5.43 ***			-5.41 ***	-5.37 ***	0.23–0.43 ***

(Table 4 continues on the next page.)

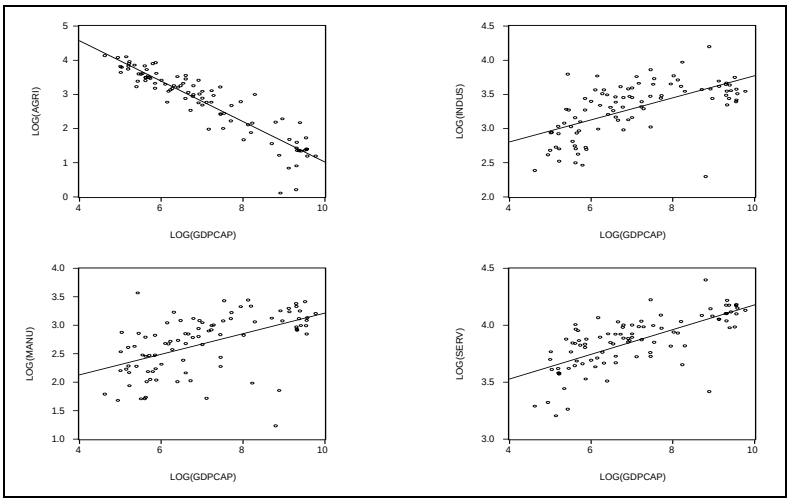
Table 4 (continued):

structural variable	t-statistics and significance								range of adjusted R^2
	loglin1	loglin2	loglin3	loglin4	loglin5	loglin6	loglin7	loglin8	(MIN-MAX)
ex1ex	-7.79 ***	-7.66 ***	-7.95 ***	-7.56 ***	-7.30 ***	-5.80 ***	-8.16 ***	-7.55 ***	0.39–0.53 ***
ex2ex	-5.91 ***	-6.15 ***	-6.28 ***	-5.94 ***	-5.08 ***	-3.83 ***	-6.49 ***	-6.04 ***	0.27–0.44 ***
ex3ex	-3.12 ***	-3.56 ***	-3.41 ***	-3.41 ***	-2.32 ***	-2.17 ***	-3.52 ***	-3.47 ***	0.08–0.13 ***
exsex	-8.88 ***	-8.91 ***	-9.72 ***	-8.95 ***	-8.97 ***	-6.83 ***	-10.05 ***	-8.94 ***	0.46–0.63 ***
ex1w	4.26 ***	4.77 ***	4.52 ***	4.52 ***			4.49 ***	4.22 ***	0.27–0.46 ***
ex2w	8.16 ***	9.16 ***	10.08 ***	10.08 ***	5.91 ***	5.91 ***	9.94 ***	9.59 ***	0.46–0.72 ***
ex3w	8.72 ***	9.50 ***	10.67 ***	10.67 ***	6.70 ***	6.70 ***	10.55 ***	10.23 ***	0.52–0.74 ***
exsw	7.12 ***	7.90 ***	8.46 ***	8.46 ***	4.55 ***	4.55 ***	8.37 ***	8.14 ***	0.43–0.69 ***
fin1	9.22 ***	9.54 ***	9.41 ***	9.75 ***	8.84 ***	8.50 ***	9.53 ***	9.58 ***	0.47–0.59 ***
fin2	5.57 ***	5.26 ***	5.23 ***	5.25 ***	3.52 ***	3.73 ***	5.36 ***	5.34 ***	0.21–0.26 ***
fin3	2.40 **	2.02 **	2.16 **	2.10 **	1.55	1.83 *	2.15 **	2.02 **	0.01–0.05
fin4	9.97 ***	9.33 ***	9.12 ***	9.11 ***	8.11 ***	7.76 ***	9.11 ***	9.00 ***	0.48–0.52 ***

Notes:
* Significant at the 90% level
** Significant at the 95% level
*** Significant at the 99% level

(a) The scatter diagram with the shares of agriculture shows that very little deviation exists from the best fitted line, indicating a strong negative relationship. On the other hand, the scatter diagrams of the other three sectoral shares show some deviation from the general trend. At least three outliers exist: Gabon, Saudi Arabia,[14] and Ireland.[15]

Figure 1: Scatter Diagram for Sectoral Shares of GDP



(b) Although evidence exists for monotone increasing relationships between development and the shares of industry and manufacturing for average data across ninety-three countries, there is some indication for decreasing shares of industry and manufacturing for the top income countries. This can be seen to some degree in the scatter diagrams, the group averages of industry, and especially if analyzing time series data. However, the estimation of an inverse U-shaped relationship did not provide significant parameters for a decreasing relationship on the right-hand side of the maximum.[16] It is important to note that the significant results of the positive relationship to the left of the maximum is consistent with the overall result.

2. Investment Shares in GDP

[14] Gabon and Saudi Arabia's industrial shares (53% and 66%, respectively) are extremely high, compared with the other upper-middle-income countries. Such high industry shares of Saudi Arabia and Gabon are due to large petroleum industries. Given these high industry sectors, the manufacturing and service sectors are subsequently too low compared with other middle-income countries.

[15] Although Ireland is an industrialized country, its share of industry is inconsistent with any other industrial country. Excluding Ireland, the industrialized countries sectoral shares of industry are within the range of 28% (Netherlands) and 42% (Japan). Ireland's average share of industry from 1970–94 is less than 10%. Accordingly, Ireland's manufacturing sector is also very low (less than 3.5%), whereas its service sector is very high (higher than 81%).

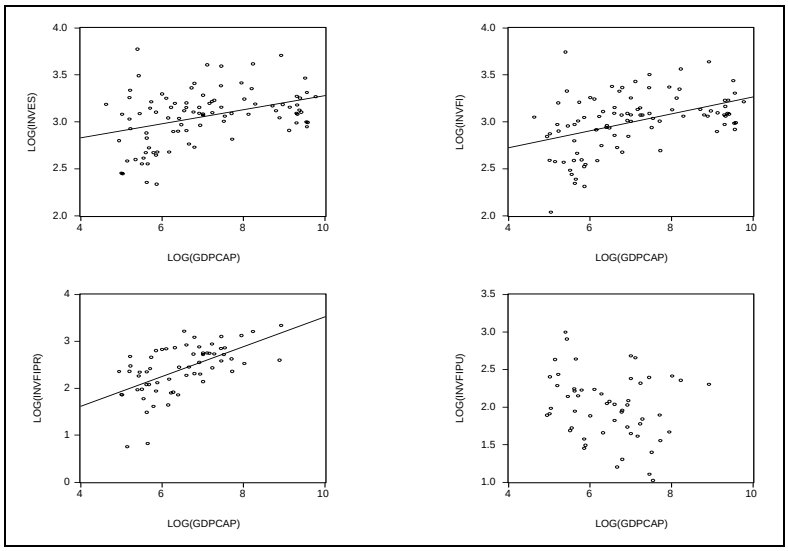
[16] The right-hand specification may become significant in the future, assuming that the current trend of the most industrialized countries continues and also spreads to currently upper-middle-income countries.

Some evidence exists of a positive relationship between the level of development and the share of gross domestic investment to GDP (total, fixed, or private). The positive relationship is the strongest between private fixed investment and development, although the fact that no data are available for the industrialized countries must be taken into account. There is no indication of any systematic relationship between the level of development and the share of public investment to GDP.

a. Scatter Diagrams

The scatter diagrams reflect the positive relationships between GDP per capita, on the one hand, and the shares of gross domestic, domestic fixed, and fixed private investment to GDP, on the other. The scatter diagram does not indicate any systematic relationship between the level of development and the share of public fixed investment to GDP.

Figure 2: Scatter Diagrams of Shares of Investment to GDP



b. Country Group Averages

The group averages of lower-middle-, upper-middle-, and high-income countries are very close to each other for gross domestic investment (24.02, 24.45, 24.33) as well as for domestic fixed investment (22.32, 23.60, and 23.59). This casts some doubt on strictly positive relationships between these variables and the level of development. For the shares of fixed private investment, the country group averages parallel the positive relationship of the scatter diagram, whereas they are inconclusive for fixed public investment.

c. Cross-Country Regressions

Clearly, the strongest results come from the eight different specifications regressing development to the four investment shares. Although the βs are never significant for public fixed investment, they are significant at the 99% level for all eight different specifications of gross domestic investment, for all eight different specifications of domestic fixed investment, and for

all eight specifications of fixed private investment.

d. Coefficients of Determination and Correlation

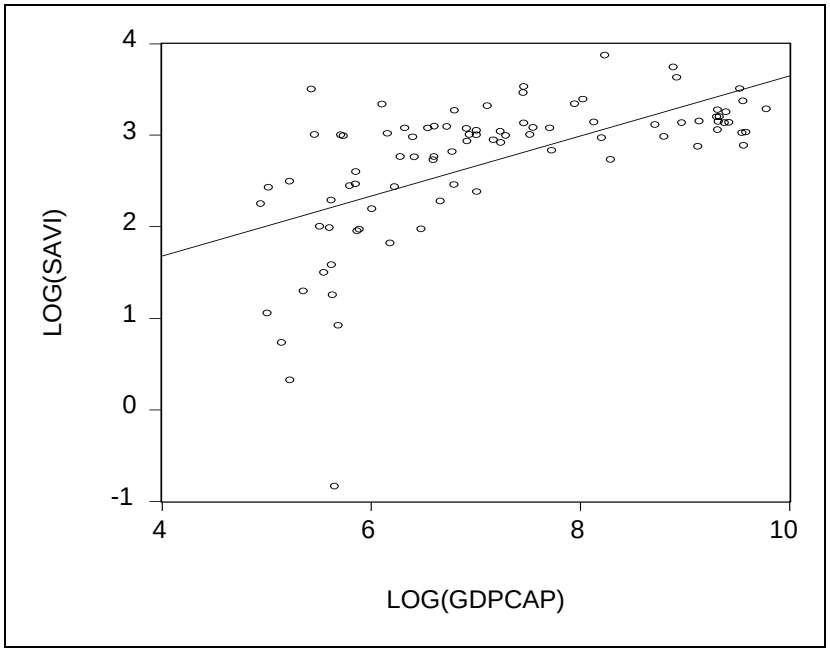
The just described trends and degrees of relationships are confirmed by the relative size of the R^2s, because they are always below 0.08 (our threshold R^2) for fixed public investment, between 0.12 and 0.21 for gross domestic investment, between 0.17 and 0.23 for domestic fixed investment, and between 0.30 and 0.35 for fixed private investment.

3. Savings and Consumption

a. Savings

The strong positive relationship between development and private investment is paralleled by a robust positive relationship between development and savings. All tools of analysis are consistent with each other. For example, the βs of the eight different specifications are always significant at the 99% level; the R^2s vary between 0.30 and 0.43.[17]

Figure 3: Scatter Diagram of Saving Shares to GDP



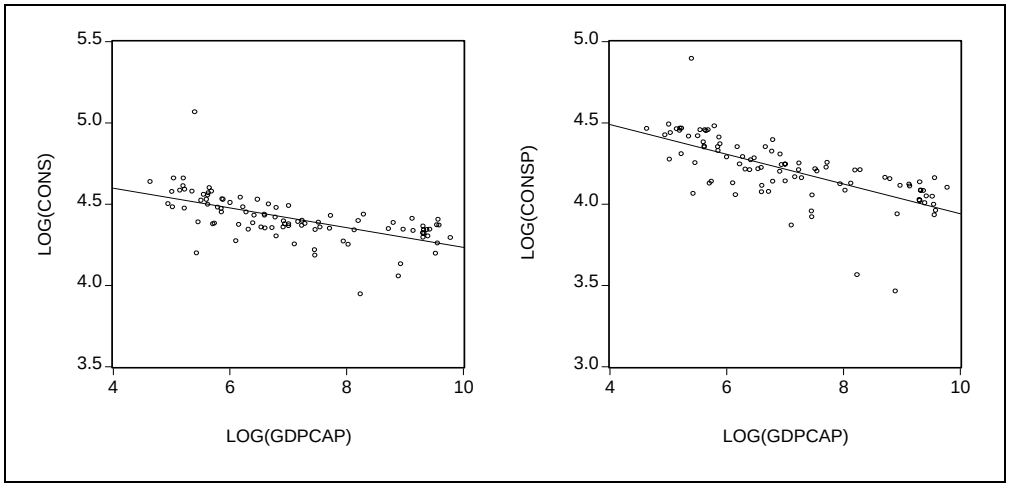
b. Total Consumption

Given the robust positive relationship between development and savings and the one between development and investment, it is not surprising to find a robust negative relationship

[17] The highest R^2s are obtained for specifications controlling for the net resource inflows. The lowest R^2s are obtained for the bivariate specifications.

between development and shares of total consumption.[18] All tools of analysis confirm a negative relationship between development and the share of total consumption. For example, the βs of all eight different regression specifications are significant at the 99% level, the country-group averages are monotonically falling, and the scatter diagrams reflect a very robust relationship with very little deviation.

Figure 4a: Scatter Diagrams of Total and Private Consumption to GDP



c. Government Consumption and Private Consumption

Although the country group averages do not allow establishing a relationship between the level of GDP and the share of government consumption to GDP, a strong negative relationship exists between the level of development and private consumption shares to GDP. This is consistent with the results derived in the last paragraph. Moreover, it is consistent with earlier country-specific studies, particularly those of Engel (1857) and Houthakker (1957). In addition, the result is consistent with the Keynesian consumption function and the inability to smooth consumption due to credit constraints.

4. Government Expenditures and Revenues

a. Government Expenditure

The average share of government expenditure in GDP is 23.6% for low-income countries, 21.8% for lower-middle-income countries, 25.8% for upper-middle-income countries, and 33.2% for high-income countries. Although these averages suggest that a considerable difference exists between developing and industrialized countries, the value for the group of low-income countries

[18] Analogous to the footnote of figure 7, Gabon's and Saudi Arabia's shares of total consumption are artificially pushed down (Gabon: 51.9%, Saudi Arabia: 57.8%) and are, therefore, excluded from the country group averages. The four countries with consumption shares of more than 100% are included in the low-income group because their exclusion would not change the result significantly. For example, excluding Lesotho's total consumption share of 159% would only push down the low-income country group average by 1.76% (from 92.06% to 90.30%).

(23.6%) is slightly higher than the value for the group of lower-middle-income countries (21.8%) and does, therefore, not allow the conclusion that an overall positive relationship exists between the share of government expenditures and the level of development. However, a careful analysis of the group of low-income countries shows that three low-income countries bias the average of low-income countries upward and that the averages indicate a positive relationship after excluding these three countries.[19] The regression results based on all ninety-three countries confirm the positive relationship because the t-statistics are always significant at the 99% level. Overall, we conclude that there is some weak support for the hypothesis that "Wagner's law"[20] holds even across countries.

b. Government Revenue

Although only a weak positive relationship occurred between development and government expenditures, the data on total government revenues as a share of GDP demonstrate a robust positive relationship. This positive relationship is even stronger when considering the shares of tax revenues in GDP. The average of the poorest countries is just about half the average of the industrialized countries (14% versus 28%). There is, of course, some variation. Nonetheless, the correlation coefficient of 0.56 and the results of the regression analysis[21] are ample evidence for positive relationships between development and the share of government revenues to GDP.

c. Fiscal Deficit

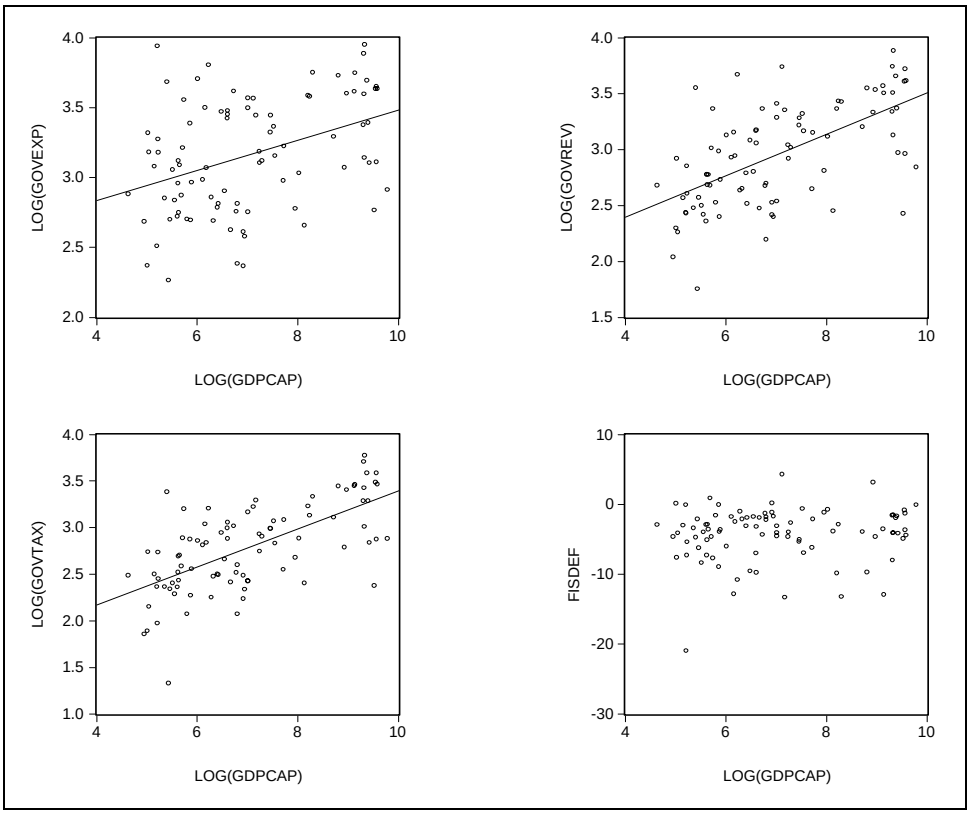
Considering the stylized fact that governments of less-developed countries have lower shares of government revenues to GDP, it is tempting to assume that a systematic relationship also exists between the level of GDP per capita and the share of the fiscal balance to GDP. However, the data do not enable us to draw such a conclusion. The twenty-five-year averages (1970–94) are 5.19%, 2.73%, 4.667%, and 3.95% for the low-income, lower-middle-income, upper-middle-income, and high-income countries, respectively. The scatter diagram also reflects the fact that little or no systematic relationship exists between the fiscal deficit and level of development.

Figure 4b: Scatter Diagram of Shares of Government Expenditures, Government Revenues, and Fiscal Balances to GDP

[19] The three countries are Mauritania (41%), Egypt (45%), and Guinea-Bissau (52%), which have higher shares of government expenditures than any other developing country. Excluding these three countries, the group average for the low-income countries would be 21.66%.

[20] A hypothesis advanced in the late nineteenth century by the German economist Adolph Wagner, which states that economic development would be accompanied by a rising share of public expenditures in GDP.

[21] The βs of all eight regression specifications are always significant at the 99% level for the share of total government revenues as well as for the share of tax revenues.



5. Inflation and Money Supply

a. Inflation

Although the country group averages of table 3 indicate that the three low- and middle-income groups have ten times higher inflation rates than the high-income group, the variation within and across the three low- and middle-income groups indicates that no systematic relationship exists between inflation and the level of GDP per capita. Any comparison of inflation rates across a large number of countries is complicated by the fact that many developing countries experienced high inflation rates at some point in time, which distort the average inflation rate. Argentina, Bolivia, Brazil, Nicaragua, Peru, and Zambia experienced inflation rates of more 1,000% per year.[22] However, even after excluding these six hyperinflationary countries, average inflation rates remain distorted and the hypothesis that inflation rates fall as development proceeds can neither be confirmed nor rejected.[23]

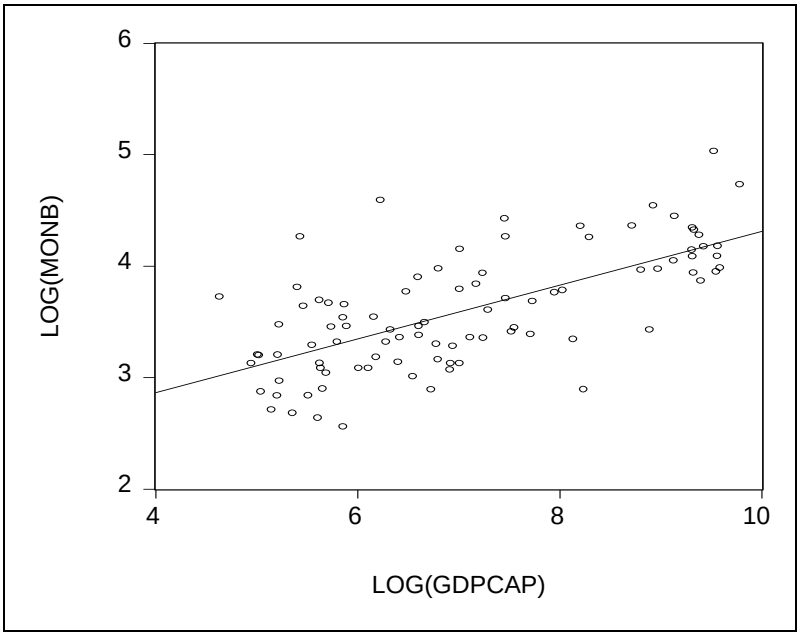
[22] This last fact is independent of calculating inflation rates based on the GDP deflator or the CPI. Considering the income level of these six countries, we see that two are upper-middle-income countries (Argentina and Brazil), two are lower-middle-income countries (Bolivia and Peru), and two are low-income countries (Nicaragua and Zambia). Interestingly, five of the six countries are in Latin America. There have been some explanations of Latin America's affinity to high inflation based on institutional characteristics and macroeconomic populism. See, for example, Dornbusch and Edwards (1990, 1994), Fisher (1990), and Sachs (1989).

[23] Using the limited data availability for the inflation rate based on the CPI, thirty-three developing countries have experienced an annual inflation rate of at least 40%. Using inflation data based on the GDP deflator, thirty-eight developing countries have experienced an annual inflation rate of at least 40% at some point during 1970–94.

b. Money Supply

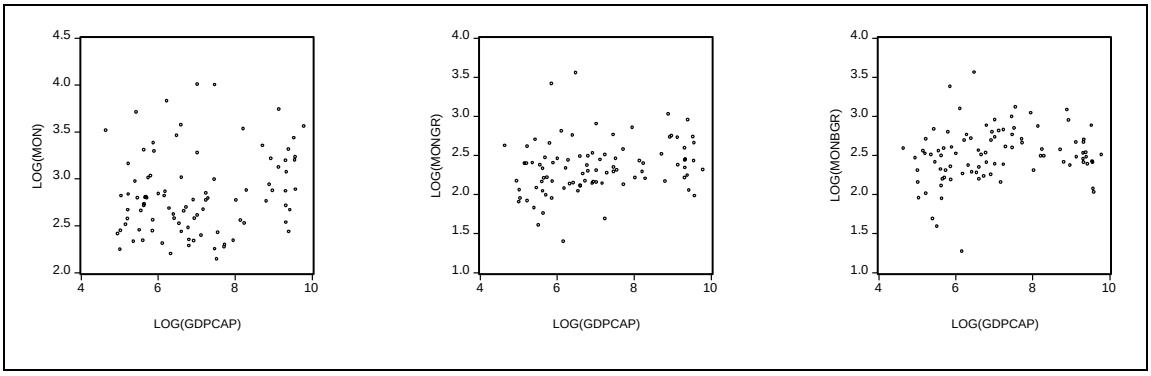
There is evidence of a positive and robust relationship between GDP per capita and the share of money supply broadly defined (M2) to GDP. This is evident from the scatter diagram, the country group averages (29.55, 36.35, 41.68, and 72.04), the βs and R^2s of the regression analysis,[24] and the correlation coefficient based on panel data (0.535). However, the data do not indicate any systematic relationship between GDP per capita, on the one hand, and the growth rate of M2, the share of money supply (M1) to GDP, or the growth rate of M1, on the other. Although some of the country group averages allow for some kind of a U-shaped relationship, the scatter diagrams do not support such a relationship because too much variation exists within each of the four country groups.

Figure 5a: Scatter Diagram of the Share of M2 in GDP



[24] All eight βs are statistically significant at the 99% level, and the coefficients of determinations are within the range of 0.45 to 0.59.

Figure 5b: Scatter Diagrams of Other Monetary Variables



6. Overall Trade and Import Variables

a. Current and Capital Account Balances

The country group averages of table 2 provide some evidence for the literature on stages in the balance of payments:[25] current account balances are positively related to GDP per capita whereas capital account surpluses are negatively related to GDP per capita. The group averages for the shares of current account balances in GDP are -11.92%, -5.15%, -1.98%, and -1.12% for the low-, lower-middle-, upper-middle-, and high-income countries, respectively. The corresponding shares of capital account surpluses are 5.53%, 3.26%, 2.12%, and 1.09%.

An initially perplexing observation is that the averages of all four country groups imply current account deficits and capital account surpluses. There are three explanations for this observation. First, our sample contains only ninety-three countries. It is theoretically possible that the excluded countries would make up for the gap in the current account surpluses. A second, more plausible explanation is that the current account balances are expressed as shares of each country's GDP without weighing these shares by the relative size of GDP. This implies that one large exporter can compensate for many small importers.[26] Third, it is well known that when official current account figures for all nations are added up, the result is—because of statistical and measurement problems—a current account deficit for the world.[27]

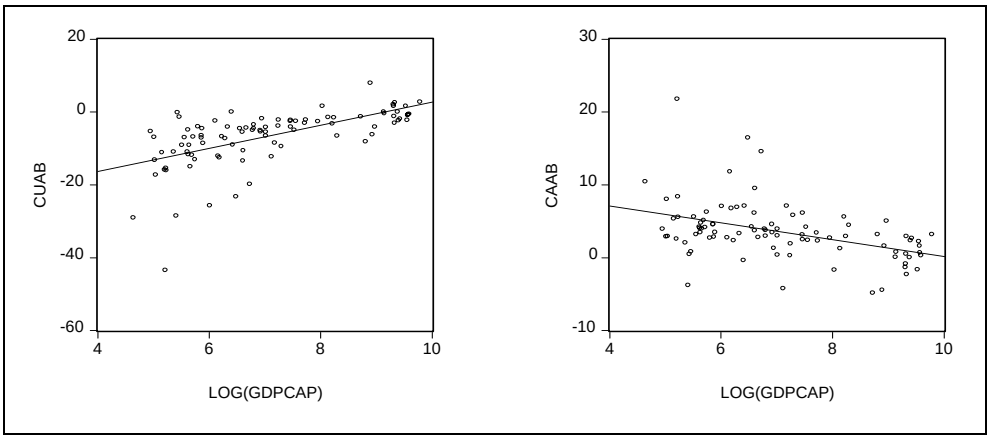
[25] See Fischer and Frenkel (1974) for an early analysis.

[26] For example, assume that Germany is a net exporter to Belgium, the Netherlands, and Luxembourg (the BENELUX countries) and that Germany's trade surplus is 3%, expressed in Germany's GDP. Given the fact that Germany's GDP is about three times the sum of the BENELUX's GDP, this would allow trade deficits of about 9% for each of the three BENELUX countries. However, adding up three times the current account deficits of 9% with one current account surplus of 3% would give an average of current account deficits of 6% [3x(-9) + 3 = -24; -24/4 = -6].

[27] See the IMF's (1987) *Report on the World Current Account Discrepancy* for more details. As Abel and Bernanke (1995, p. 153, box 5.1) illustrate, "IMF projections for 1993 were that industrial countries would have a collective $35.6 billion current account deficit, developing countries would have a $52.9 billion deficit, and former centrally planned economies would have a $24.6 billion deficit, all of which adds up to a current account deficit for the world as a whole of $113.1 billion."

The first scatter diagram of figure 6 shows a clear positive relationship between the level of GDP per capita and the share of the current account balance to GDP. On the other hand, the second scatter diagram of figure 6 shows a clear negative relationship between the level of GDP per capita and the share of the capital account balance to GDP.

Figure 6: Scatter Diagrams of Current Account and Captial Account Balances to GDP



Six semi-log regression specifications (similar to LOGLIN1 and LOGLIN6) provide consistently significant βs at the 95% level.[28] The R^2s vary between 0.33 and 0.56 for the current account variable and between 0.15 and 0.27 for the capital account variable. The difference between the goodness of fit of the current account variable and that of the capital account variable is also visible in the scatter diagrams. Nevertheless, sufficient evidence exists that current account deficits and capital account surpluses decrease as development proceeds.

b. Openness Defined as Trade Intensity

As mentioned in the introduction, Agénor and Montiel (1996) showed that "developing nations tend to be substantially more open than the major industrialized countries,"[29] in which openness is defined as the sum of import and export shares in GDP. Although using the same definition of "openness," our empirical results of twenty-one industrialized and seventy-two developing countries suggest that developing countries are less open than industrialized countries, especially after controlling for country size. Even without controlling for country size, the country group averages (60.07%, 70.41%, 66.36%, and 82.13%) tend to indicate a rather more positive than negative relationship between GDP per capita and openness. To control for country size, we added the country's land area in square kilometers as an additional explanatory variable to the six relevant specifications.

[28] Note that the regression specifications are semi-log, because we take the log of the exogenous variables, but not of the (positive and negative) endogenous variables. Note also that we have not run the last two of the usual eight specifications because they contain the net resource flow as an exogenous variable.

[29] Agénor and Montiel (1996), p. 16.

The first observation of the openness regressions is that the parameter of country size is negative and significant at 95% (or higher) for all six specifications. Second, whenever the specifications have included population or population density, their parameters are also always statistically significant at the 99% level. Third, Z and Y are significant at the 95% level. The exception is specification loglin2', for which Y is only significant at the 90% level. The coefficients of determination vary from a minimum of 0.333 to a maximum of 0.540. In conclusion, ample evidence exists of a positive relationship between trade intensity and the level of development.

c. Total Import and Merchandise Import Shares to GDP

Neither total import shares nor merchandise import shares to GDP seem to follow any systematic (linear, log-linear, or U-shaped) relationship to GDP per capita. The scatter diagrams look like big circles with observations more or less equally distributed within the circles. Looking at the movement of country group averages from low- to high-income groups, they first increase by about 5%, then drop by about 10%, but then rise sharply by more than 20%. Moreover, none of the six usual regression specifications provide any significant β. Even after correcting for country size, the βs remain insignificant for all six specifications. All this is consistent with low correlation coefficients of 0.05 for total import shares and 0.04 for merchandise import shares in GDP.

7. Export Shares

The first two export shares are analogous to the two import shares: total exports to GDP and merchandise exports to GDP. Furthermore, some data exist for the analysis of machinery exports and primary exports, expressed as either a share in GDP or in total exports.

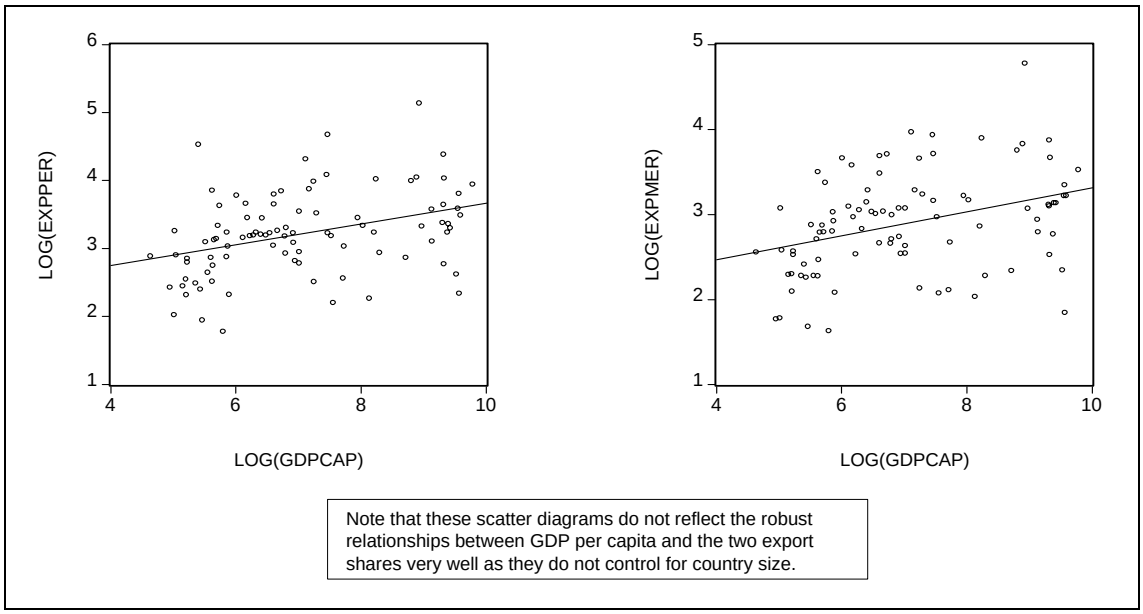
a. Total Export Shares in GDP and Merchandise Export Shares in GDP

In contrast to the result derived from the import shares, all tools of analysis show that there are positive relationships between the level of development, on the one hand, and the shares of total exports in GDP and merchandise exports in GDP, on the other. The relationships are evident even when not controlling for country size, although the R^2s are generally higher in the six specifications including country size. The βs are always significant at the 99% level in any case.

b. Exports of Machinery

We analyze two different shares of machinery exports: *(a)* the share of machinery exports in GDP (EXPMACH), and *(b)* the share of machinery exports in total exports (EXPMACHEX). For each of these two variables, we run twelve regressions: six specifications without controlling for country size and six specifications including country size as an explanatory variable. All tools of analysis provide strong support for the hypothesis that the share of machinery exports increases as the level of GDP per capita increases. Very convincing is the fact that all twenty-four regressions testing such a hypothesis provide significant βs at the 99% level.

Figure 7a: Scatter Diagrams of Shares of Exports to GDP



b. Exports of Machinery

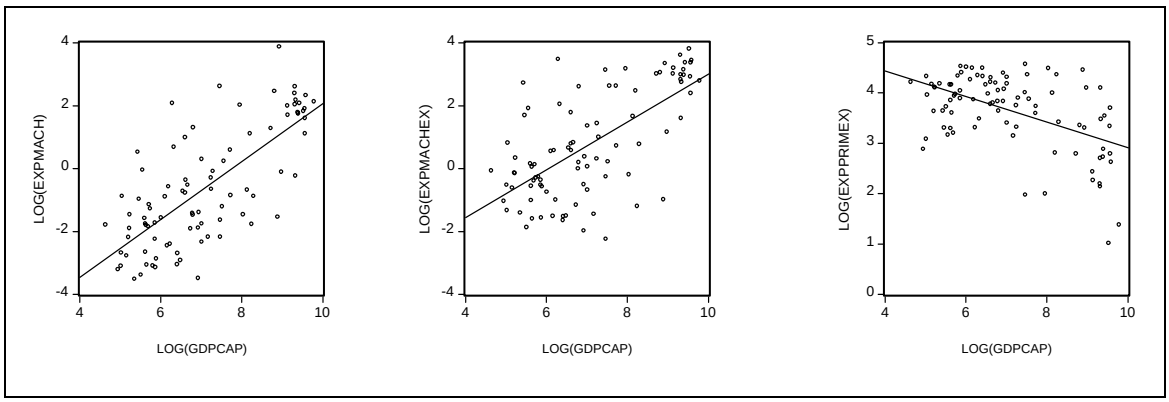
We analyze two different shares of machinery exports: *(a)* the share of machinery exports in GDP (EXPMACH) and *(b)* the share of machinery exports in total exports (EXPMACHEX). For each of these two variables, we run twelve regressions: six specifications without controlling for country size and six specifications including country size as an explanatory variable. All tools of analysis provide strong support for the hypothesis that the share of machinery exports increases as the level of GDP per capita increases. Very convincing is the fact that all twenty-four regressions testing such a hypothesis provide significant βs at the 99% level.

c. Exports of Primary Products

Analogous to the exports of machinery, we analyze two different shares of primary exports: *(a)* the share of primary exports in GDP (EXPPRIM) and *(b)* the share of primary exports in total exports (EXPPRIMEX). Again, we run twelve regressions for each of these two variables. The result is that, whereas no systematic relationship seems to exist between the level of development and the share of primary exports in GDP (EXPPRIM), there is evidence of a negative relationship between the level of development and the share of primary exports in total exports (EXPPRIMEX). This result is based on twelve nonsignificant βs for regressions of EXPPRIM and twelve highly significant βs (99% level) for regressions of EXPPRIMEX. Note that there is no contradiction between the facts that a relationship exists for primary exports in total exports (EXPPRIMEX) but no relationship for the share of primary exports in GDP (EXPPRIM). This is because the industrialized countries' higher total export share implies that the share of primary exports in total exports is considerably lower than for less-developed countries.

Figure 7b: Scatter Diagrams of the Share of Machinery Exports in GDP,

the Share of Machinery Exports in Total Exports, and the Share of Primary Exports in Total Exports

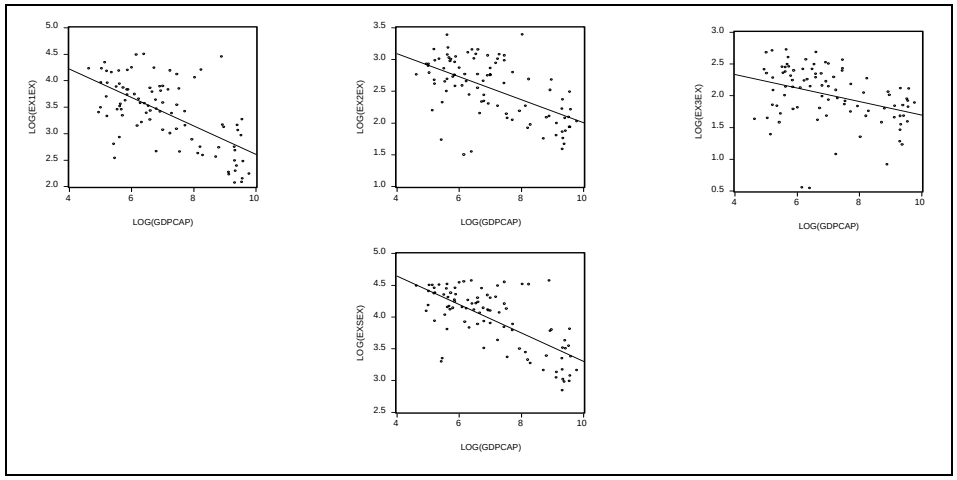


8. Export Product Concentration (EPC)

The panel data correlation coefficient between EPC and GDP per capita is -0.517. The sum of the shares of the three major export goods in total exports is 72.15%, 62.73%, 54.48%, and 28.72% for the low-income, lower-middle-income, upper-middle-income, and high-income countries, respectively. The regressions provide significant βs for all eight specifications at the 99% level, and the R^2s vary between 0.47 and 0.64. It is, therefore, concluded that a negative relationship exists between a country's level of development and a country's export product concentration. This stylized fact is very robust, because it holds even for each of the three main export goods individually. For example, the shares of the first major export good in total exports are 46.15%, 37.52%, 31.59%,[30] and 14.73% for the low-, lower-middle-, upper-middle-, and high-income countries respectively. All the βs remain significant for all eight specifications: for the first and second individual export concentration shares (EX1EX and EX2EX) at the 99% level and at the 95% significance level for the third individual export concentration measure (EX3EX). It is only natural that the significance level decreases as we move from the first to the second and then to the third major export good.

[30] After excluding Saudi Arabia, whose share of oil exports in total exports is more than 85%. Nevertheless, the trend remains even with Saudi Arabia. Including Saudi Arabia, the group average for the upper-middle-income countries would be 36.52%.

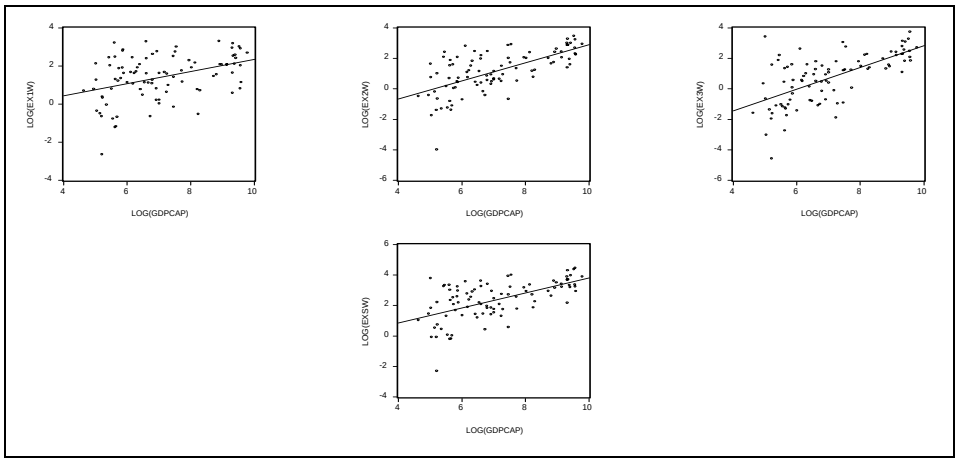
Figure 8: Scatter Diagram of Export Product Concentration



9. Market Power in World Export Markets

Although developing countries have higher shares of export product concentration than industrialized countries, the shares of developing country exports in world exports is lower than the shares of industrialized country exports in world exports. The scatter diagrams, group averages, panel data correlation coefficients, and many different regressions[31] indicate a robust relationship between a country's market power in world exports and a country's GDP per capita.

Figure 9: Scatter Diagram of Export Market Power in World Markets



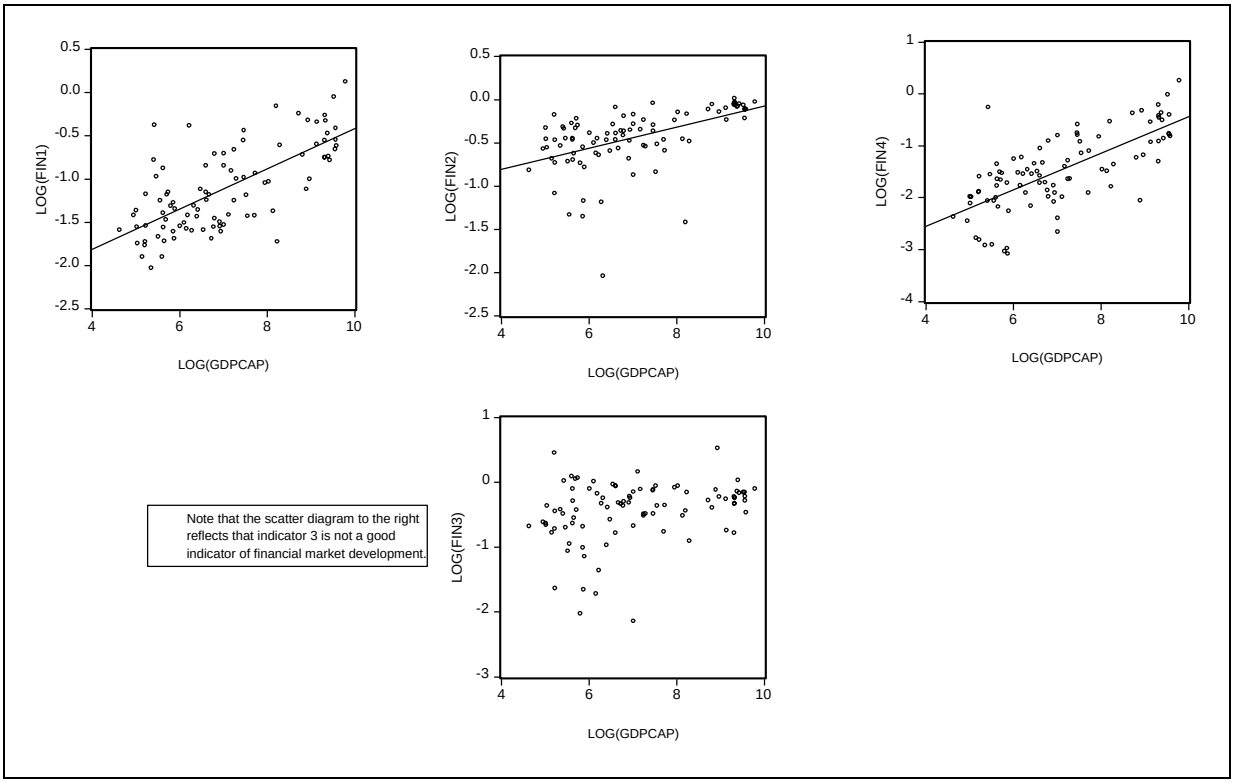
[31] Different specifications (with and without country size, population, population density, and net resource flow) tested for such a relationship and provided always significant βs at the 99% level or higher.

10. Financial Market Development

We indicated earlier in subsection 5 of this section that the share of money supply, broadly defined (M2) in GDP, is positively related to the level of GDP per capita. As M2 comprises money and quasi-monetary liabilities of a country's financial institutions to residents other than the central government, the share of M2 in GDP can easily be defined as a measure of financial market development. However, the recent literature provides four alternative indicators of financial development (see table 1 and the discussion in appendix 1).

All tools of analysis provide consistent results for indicators FIN1, FIN2, and FIN4. However, they are less convincing for indicator FIN3. For example, all eight different specifications provide βs that are always significant at the 99% level for indicators FIN1, FIN2, and FIN4. For indicator FIN3, the βs are not always statistically significant at the 95% level. Although this casts doubt on the appropriateness of FIN3 as a measure of financial market development (which is discussed in more detail in appendix 3), it can be concluded that a positive relationship exists between financial market development and the level of GDP per capita.

Figure 10: Scatter Diagram of Financial Market Development



11. Summary of Results: Stylized Facts

The last ten sections have shown many relationships between development and economic structure. Thirty-three structural variables are systematically related to the level of GDP per capita. Given the robustness of these relationships and the fact that the analysis is based on the actual experience of ninety-three countries from the period of 1970–94, it is justified to define these relationships as stylized facts of development patterns for 1970–94.

Stylized Fact 1: Sectoral Shares of GDP

As GDP per capita rises, the share of agriculture in GDP falls and the shares of industry, manufacturing, and services to GDP rise.

Stylized Fact 2: Total and Private Investment

The shares of gross domestic investment to GDP, domestic fixed investment in GDP, and fixed private investment in GDP increase as development proceeds.

Stylized Fact 3: Savings, Total and Private Consumption

The savings ratio is higher, the higher the level of GDP per capita. Consistent with the patterns of the savings ratio, the shares of total and private consumption in GDP fall as GDP per capita rises.

Stylized Fact 4: Government Expenditures and Government Revenues

The share of government expenditures and the share of government revenues are generally higher for countries with high levels of GDP per capita than for countries with low levels of GDP per capita.[32]

Stylized Fact 5: Current Account, Capital Account, and Trade Intensity

As development proceeds, current account deficits and capital account surpluses decrease while trade intensity (openness) increases.

Stylized Fact 6: Total and Merchandise Exports

The shares of total exports and merchandise exports in GDP increase as GDP per capita rises. When looking at stylized fact five, there is a strong indication that the improvement of the current account balance and the increase in trade intensity is caused by increases in the share of total exports and merchandise exports.

Stylized Fact 7: Composition of Exports

As GDP per capita rises, the share of machinery exports in GDP as well as in total exports increases and the share of primary exports in total exports decreases.

Stylized Fact 8: Export Product Concentration

A country's export product concentration is higher, the poorer the country is.

[32] Although this relationship is relatively weak in the case of government expenditure, it is relatively strong in the case of government revenues, for which it holds for total government revenues as well as government tax revenues.

Stylized Fact 9: Export Market Power

A country's market power in world exports is higher, the more developed it is.

Stylized Fact 10: Financial Market Development

A strong positive relationship exists between development defined as GDP per capita and appropriately defined financial market development.

V. Conclusions

1. Implications for the Growth Literature

The analysis has shown that structural differences remain relevant, even though many of the countries have chosen different economic policies to achieve development and growth, have different institutional features, and had different initial conditions to some degree. The persistence in development pattern implies that structural differences remain relevant for understanding the development process. However, the interest in structural analysis has decreased considerably since the emergence of the so-called new or endogenous growth theory. Endogenous growth theory relates economic growth to production functions with either increasing returns to scale or nondiminishing returns to reproducible capital.[33] More recently, additional factors influencing the effectiveness of physical and human capital, such as income distribution and political instability have found their way into the growth literature.

Considering economic structure, the growth literature has limited the analysis to investment shares,[34] trade shares and trade intensities,[35] and financial market development.[36] The above analysis has shown that many more structural features exist that can explain why growth and development succeeds or stagnates. Although economic structure cannot be changed in the short run, it is endogenous in the long run. Indeed, our results have shown that successful development implies changes in economic structure. Appropriate macroeconomic policies can

[33] Aggregate production functions used in the growth literature have been criticized for not taking into account changes in sectoral composition. See, for example, Pack (1994, p. 68), who refers explicitly to Denison (1985). Denison (1985) finds that intersectoral shifts in production explain part of aggregate growth. Pasinetti (1994, p. 356) has criticized new growth theory for being "essentially one-commodity models, with no structural change." Cornwall and Cornwall (1994) use a structuralist model of Sundrum (1991) to show that, whereas new growth theory endogenizes growth, it neglects aggregate demand and distributional shifts in output and employment. By analyzing the European integration, they show that economic structure matters.

[34] See especially the contributions by De Long and Summers (1991) and (1993).

[35] Some discussion has occurred on what impact trade intensity and outward orientation really has had on growth. For example, although Dollar (1992) provides strong evidence for a positive relationship between outward-orientation and growth, Singh (1994) is more critical on how open the East Asian miracle countries really have been.

[36] The impact of financial market development on growth has been analyzed by Bencivenga and Smith (1991), Greenwood and Jovanovic (1990), and especially by Ross Levine and others (Levine and Renelt [1992], King and Levine [1993], Demirgüc-Kunt and Levine [1996], Levine and Zervos [1996], and Levine [1997]).

support the changes in economic structure and, thus, achieve development faster than by neglecting the relevance of economic structure.

2. Limitations and Implications for Future Research

The above analysis contains considerable limitations; a word of caution seems appropriate. First, as was visible from the scatter diagrams, a considerable amount of variation exists across countries. Because the analysis has been based on the experience of ninety-three countries in the period 1970–94, much remains to be done at the country or country-group level. Given this high level of aggregation, making generalizations may not hold for certain subgroups. This has been demonstrated by Helleiner (1986), who argued, for example, that "the evidence for an association between the degree of export orientation and the rate of economic growth in poor countries is extraordinarily weak."[37]

Second, further research would be desirable to include further explanatory variables, such as export and import elasticities or social and institutional indicators. The main problem here is to come up with operational and consistent definitions that are not as arbitrary as many of them are today.

Third, the relevance of economic structure should not be interpreted as implying that countries with unfavorable economic structures have no way out of a vicious circle of underdevelopment. The world is changing continuously, and current or past patterns of development do not need to hold forever. However, it is also unlikely that all these relationships and stylized facts of the last twenty-five years will suddenly break down and become irrelevant. The constant use of checks and balances will be needed to adjust policies to reflect new patterns that have not been analyzed yet but that can determine whether a country achieves equitable, sustainable, and participatory development.

[37] Helleiner (1986), p. 140.

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Appendix 1: List of Countries

The limitation to ninety-three countries is based on the analysis of countries for which a critical mass of data is available. After excluding the fifty-eight economies with populations of fewer than 1 million,[38] such data are mostly available for the ninety-three countries listed below. Most of the other countries for which generally too little data are available are currently or formerly socialist economies. The ninety-three countries included in the analysis are classified by income into four country groups:

(1) = low-income country
(2) = lower-middle-income country
(3) = upper-middle-income country
(4) = high-income country.

Algeria (2), Argentina (3), Australia (4), Austria (4), Bangladesh (1), Belgium (4), Benin (1), Bolivia (2), Botswana (2), Brazil (3), Burkina Faso (1), Burundi (1), Cameroon (1), Canada (4), Central African Republic (1), Chad (1), Chile (3), China (1), Colombia (2), Congo (1), Costa Rica (2), Côte d'Ivoire (1), Denmark (4), Dominican Republic (2), Ecuador (2), Egypt (1), El Salvador (2), Finland (4), France (4), Gabon (3), Gambia (1), Germany (4), Ghana (1), Greece (3), Guatemala (2), Guinea-Bissau (1), Haiti (1), Honduras (1), India (1), Indonesia (2), Ireland (4), Italy (4), Jamaica (2), Japan (4), Kenya (1), Republic of Korea (3), Lesotho (1), Madagascar (1), Malawi (1), Malaysia (3), Mali (1), Mauritania (1), Mauritius (3), Mexico (3), Morocco (2), Myanmar (1), Nepal (1), Netherlands (4), New Zealand (4), Nicaragua (1), Niger (1), Nigeria (1), Norway (4), Pakistan (1), Panama (2), Papua New Guinea (2), Paraguay (2), Peru (2), Philippines (2), Portugal (4), Rwanda (1), Saudi Arabia (3), Senegal (1), Sierra Leone (1), Singapore (4), Somalia (1), Spain (4), Sri Lanka (1), Sudan (1), Sweden (4), Switzerland (4), Syrian Arab Republic (2), Tanzania (1), Thailand (2), Togo (1), Tunisia (2), Turkey (2), United Kingdom (4), United States (4), Uruguay (3), Venezuela (2), Zaire (1), and Zambia (1).

Source: World Bank, *World Development Report 1996,* Table 1, pp. 188–89.

[38] See table 1a in *World Development Report 1996* (p. 222) for a list of these fifty-six countries with populations of fewer than 1 million.

Appendix 2: Definitions of Structural Variables

1. Sectoral Composition of Output

a. Agriculture

Agriculture covers forestry, hunting, and fishing, as well as agriculture. In developing countries with a high level of subsistence farming, much of agricultural production is either not exchanged or not exchanged for money. This increases the difficulty of measuring the contribution of agriculture to GDP and reduces the reliability and comparability of such numbers.

b. Industry

The industry sector comprises mining and quarrying; manufacturing; construction; and electricity, gas, and water.

c. Manufacturing

The manufacturing sector comprises all industrial commodities, excluding mining and quarrying; construction; and electricity, gas, and water.

d. Services

The service sector includes all service activities, that is, transport, storage, and communications; wholesale and retail trade; banking, insurance, and real estate; ownership of dwelling; public administration and defense; and other services.

2. Investment

a. Gross domestic investment

Gross domestic investment is the sum of gross domestic fixed investment (see definition below) and change in stocks.

b. Gross domestic fixed investment

Gross domestic fixed investment comprises all outlays (purchases and own-account production) on additions of new and imported durable goods to the stocks of fixed assets, less the proceeds of net sales of similar secondhand and scrapped goods. Outlays by general government on durable goods primarily for military purposes are excluded. According to the System of National Accounts (SNA), those outlays are treated as current consumption and classified under government consumption.

c. Domestic fixed private/public investment

Gross domestic fixed private/public investment comprises all outlays (purchases and own-account production) by private/public sector enterprises on additions of new and imported durable goods to the stocks of fixed assets, less the proceeds of net sales of similar secondhand and scrapped goods.

3. Consumption and Savings

a. Total consumption

Total consumption is the sum of private consumption (see definition below) and general government consumption (see definition below).

b. Private consumption

Private consumption expenditure comprises the market value of all goods and services purchases or those received as income in kind by individuals and nonprofit institutions, including the imputed rent of owner-occupied dwellings.

c. General government consumption

General government consumption covers all current expenditures for goods and services by government bodies. Excluded are outlays of public nonfinancial and public financial enterprises. According to the SNA, outlays of the general government on durable goods primarily for military purposes are included under this item.

d. Gross domestic savings

Gross domestic savings is equal to gross domestic product minus total consumption.

4. Government Expenditures and Revenues

a. Total government expenditure

Total government expenditure includes all nonrepayable and nonrepaying payment by government, whether for current or capital purposes. Expenditure excludes government amortization payments (which are classified in financing) and government lending (which is classified in lending minus repayments).

b. Total revenue

Total revenue includes all receipts, whether requited or unrequited, other than grants. Revenue is shown net of refunds and other adjustment transactions. Revenue is otherwise shown gross except for the proceeds of departmental enterprise sales to the public, which are netted against the corresponding operating expenditures.

c. Tax revenue

Total revenue is defined as all government revenues from compulsory, unrequited, nonrepayable receipts for public purposes, including interest collected on tax arrears and penalties collected on nonpayment or late payments of taxes.

d. Fiscal deficit

The sum of total expenditure and government lending minus repayments, less the sum of revenue and all grants received. The primary source is the International Monetary Fund's (IMF's) Government Finance Statistics Yearbook (GFSY). GFSY data are reported by countries using the system of common definitions and classifications found in the IMF *Manual on Government Finance Statistics (1986).*

5. Inflation and Money Supply

a. GDP deflator

The GDP deflator is derived by dividing current price estimates of GDP at market prices by constant price estimates, also called the implicit GDP deflator.

b. Consumer Price Index (CPI)

The consumer price index (CPI) is the most frequently used indicator of inflation and reflects changes in the cost of acquiring a fixed basket of goods and services by the average consumer. This item is equal to line "64...zf" in the IMF's International Financial Statistics publication.

c. Money supply (M1)

Money is the sum of currency outside banks and demand deposits other than those of the central government. This series, frequently referred to as M1, is a narrower definition of money than M2 (i.e., money plus quasi-money). Data are from the IMF's monetary survey. This item is equal to line "34...zf" in the IMF's International Financial Statistics publication.

d. Money supply broadly defined (M2)

The money supply broadly defined, also called M2, comprises money and quasi-monetary liabilities of a country's financial institutions to residents other than the central government.

6. Overall Trade and Import Variables

a. Current account balance

The current account balance before official transfers is the sum of net exports of goods and nonfactor services, net factor services, net factor service income, and net private transfers. This item is equal to line "77a.d" in the IMF's International Financial Statistics publication.

b. Capital account balance

The capital account balance is calculated from the IMF's *International Financial Statistics* as the sum of net direct investment (line item 77bad), net portfolio investment (line item 77bbd), the net of other capital investments (line item 77g.d), and net errors and omissions (line item 77e.d).

c. Total imports

Total imports of goods and services are the sum of merchandise imports free on board (f.o.b.), imports of nonfactor services and factor payments.

d. Merchandise imports

Merchandise imports refer to all movable goods (including nonmonetary gold) involved in a change of ownership from nonresidents to residents. Merchandise imports are valued free on board (f.o.b.) at the customs frontier of the exporting country. An f.o.b. price at the customs frontier includes the value of the goods and the value of outside packaging, and related distributive services used up to and including loading the goods onto the carrier at the customs frontier of the exporting country. The few types of goods not included in merchandise include travelers' purchases abroad, which are included in travel, and purchases of goods by diplomatic and military personnel, which are classified under other official goods, services, and income.

e. Trade openness

Trade has long been viewed as the engine of growth; therefore, trade openness becomes an important structural characteristic. Unfortunately, as Leamer (1988) has pointed out, no perfect measure of trade openness exists. Yet, there are two extreme definitions of trade openness with a range of definitions in between. At the one extreme, openness is defined as trade intensity, that is, the factual realization of import and export shares of GDP without any corrections for tariffs and other trade restrictions.[39] At the other extreme, trade openness is defined as a measure of trade restrictions without taking into account the actual size of import and export shares.[40]

[39] For example, the Summers and Heston data set has followed this simple definition of openness. The first extreme definition (trade intensity) has three advantages: availability, conceptual simplicity, and theoretical purity. However, the major problem of this definition is a bias caused by trade restrictions, country size, and the availability of resources. Leamer (1988) tried to overcome these problems by using data on supplies of productive resources and distances to markets to derive an adjusted trade intensity ratio as an alternative openness measure. However, even this sophisticated measure of openness has earned a variety of criticisms. See the comments on Leamer's article by Brown (1988). For example, Brown (1988, p. 201) writes that "this procedure will tell us how a country's trade pattern is deviating from the average trade pattern for countries similarly endowed" but doubts that this is really what we mean by openness.

[40] For example, Sachs and Warner (1995) have defined an openness variable that measures the proportion of years during which an economy is open to trade. An economy is deemed to be open to trade if it satisfies four tests: *(a)* average tariff rates are below 40%, *(b)* average quota and licensing coverage of imports is less than 40%, *(c)* a possible black market premium is less than 20%, and *(d)* there are no extreme controls (taxes, quotas, and state monopolies) on exports. Besides the fact that it is usually very difficult to calculate average tariff and licensing coverage rates, the definition also neglects considerable differences in openness of countries with tariff rates of less than 40%. For example, it does not seem to be appropriate to put a country with no tariffs, no quotas, no licenses, and no black market premium at the same level as a country with an average of 35% tariff rates and 35% import quotas. The problems of the second definition are related to *(a)* the nonavailability of data (especially after the rise in the relative importance of nontariff barriers) and *(b)* the conceptual complexity of how to combine the different trade restrictions with each other. Leamer (1988) has also provided a measure of overall trade interventions by taking the difference between the degree of trade intensity predicted in his model and the actual degree of trade intensity. Clearly, this definition depends on the accuracy of the predicted trade intensity.

The most important contribution of Leamer's analysis is its strict differentiation between the two definitions of openness: trade intensity and the inverse of overall trade intervention. Nevertheless, most of the later trade literature has continued to mix up the two definitions by combining aspects of trade intensity with aspects of trade interventions. The resulting measure of such a mix is completely arbitrary. For example, a large country (in terms of land area) can have low levels of exports and imports, expressed as percentages of GDP, even though it may have neither tariffs nor other trade restrictions. On the other hand, a tiny country with high tariff rates may nevertheless have high trade shares to GDP, simply because of its small size. Depending on how trade intensity and trade restrictions are combined with each other, the large or the small country may appear to be more open than the other one. It is suggested the analysis be confined to the unadjusted trade intensity ratio, defined as the sum of export and import shares to GDP. There are three reasons for this limitation: *(a)* it is inappropriate to mix trade intensity and trade intervention measures, *(b)* no objective way to measure trade interventions exists, and *(c)* criticism remains of Leamer's suggestion to adjust trade interventions.

7. Export Variables

a. Total exports

Total exports of goods and services are the sum of merchandise exports f.o.b., exports of nonfactor services, and factor receipts.

b. Merchandise exports

Merchandise exports refer to all movable goods (including nonmonetary gold) involved in a change of ownership from residents to nonresidents. Merchandise exports are valued free on board (f.o.b.) at the customs frontier of the exporting country. An f.o.b. price at the customs frontier includes the value of the goods, the value of outside packaging, and related distributive services used up to and including loading the goods onto the carrier at the customs frontier of the exporting country. The few types of goods not included in merchandise include travelers' purchases abroad, which are included in travel, and purchases of goods by diplomatic and military personnel, which are classified under other official goods, services, and income.

c. Exports of machinery

Exports of machinery comprise commodities in the Standard International Trade Classification (SITC) Rev. 1, Section 7 (Machinery and Transport Equipment).[41]

d. Primary exports (as % of GDP)

Exports of primary products comprise commodities in SITC Rev. 1, Section 0 to 4 and 68 (Food and Live Animal, Beverages and Tobacco, Animal and Vegetable Oil and Fat, Crude Materials, including Fuels, and Non-Ferrous Metals. See the last footnote for remarks on data constraints.

[41] The limited data availability for exports, both of primary products and machinery is not based on economic reasons but on the collection bases of 1970, 1975, 1980, 1985, 1990, 1992, and 1993. Therefore, it is less likely to constitute a selection bias than if the data were missing because of economic turmoil. A second reason to include these variables is that they can easily be expressed as ratios to total exports and avoid problems related to biases caused by the country size.

8. Export Product Concentration

An important indicator of economic structure is the degree of a country's export product concentration, which is (analogous to the Herfindahl index of market concentration) defined as the sum of the shares of the three major export goods in total exports of each country. The major export good of a country is simply the export good with the highest share in total export of each country, based on annual data. The second and third major export goods of a country are the export goods with the second and third highest export shares, again based on annual data. The export good classification is based on SITC 3 digits, revision 1. The original source, from which this data was necessary to extract country by country and year by year, is the United Nations Trade Data Base.

9. Export Market Power

Similar to the definition of a country's export product concentration, it is possible to derive a country's export market power in world exports. The most simple definition of such a characteristic would be to express a country's major export good as a percentage of world exports of that good and year under consideration. However, as for any concentration measure, the quality of such a measure could be improved by expressing also the second and third major export goods as a percentage of world exports of those two goods and by adding up the three shares to achieve a more comprehensive concentration measure. Again, this has been done country by country and year by year, based on SITC 3 digits, revision 1.

10. Financial Market Development

The recent literature has given importance to the degree of financial market development. Following the influential work of King and Levine (1993) and reiterated in Levine (1997), there are four indicators of financial market development. The first indicator (FIN1) measures the size of financial intermediaries. FIN1 is, therefore, defined as the ratio of liquid liabilities of the financial system to GDP, whereby the liquid liabilities are defined as currency plus demand and interest-bearing liabilities of banks and nonbank financial intermediaries. The second indicator (FIN2) measures the degree to which the central bank versus commercial banks are allocating credit. FIN2 is, therefore, defined as the ratio of deposit money bank domestic assets to deposit money bank domestic assets plus central bank domestic assets. The third financial market indicator (FIN3) measures the degree to which credit is allocated to private enterprises. FIN3 is, therefore, defined as the ratio of claims on the nonfinancial private sector to total domestic credit, excluding credit to money banks. The fourth indicator (FIN4) measures the size of the private credit market. It is defined as the ratio of claims on the nonfinancial private sector to GDP.

One nice property of these indicators is that they can be easily calculated using data readily available from the IMF's International Financial Statistics, which results in at least 2,166 observations per indicator. Another likable property of FIN1 and FIN4 is that they measure financial market development as a ratio to GDP. This is consistent with the definition of most other structural variables. Rather unusual is the definition of FIN2 and FIN3, because both measure the relative size of the private sector. As FIN2 measures the relative size of credit allocated by private banks and the size of private banks constitute financial development, FIN2 makes intuitive sense. However, this is not the case for FIN3, because FIN3 measures the relative size of credit allocated to the private sector, which is related to the size of the private sector compared to the size of the government sector. FIN3 could, therefore, be interpreted as an indicator measuring the relative credit activity of the private sector to the relative credit activity of the government sector. Consequently, it is difficult to see that FIN3 is an appropriate measure of financial market development.