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ECONOMIC CHARACTERISTICS ASSOCIATED WITH SIZE: DEVELOPMENT PROBLEMS CONFRONTING SMALLER THIRD WORLD STATES

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ABSTRACT

This paper examines whether small developing countries have a particular unique set of characteristics (other than size per se) that tends to set them apart from developing countries as a whole? The main findings are that smallness appears to be a constraint on growth in two regards-momentum and the effectiveness of government expenditures. Small countries can be defined as those states not capable of sustaining momentum from one time period to another and/or those countries not capable of stimulating economic growth through cutting defense expenditures.

1. INTRODUCTION

Of the 121 countries for which comparable data is available, 33 have populations below five million (World Bank, 1990). The British Commonwealth is more extreme, with 34 of the 49 present Commonwealth members possessing populations under five million and 29 populations under one million[1] (Bray, 1987). Given the large number of relatively small countries, it is not surprising recent years have seen an increasing[2] amount of attention focused on the special problems of these countries[3].

Most of this literature is anecdotal, stressing various "disadvantages" characterizing these economics—small resource base, limited domestic markets unequal bargaining in the world economy, capital flight, and so on. What is missing from most of this literature is the empirical dimension. Specifically:

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1 Unless otherwise noted, the data used in this study is from this source.

2 Bray's review article covered four books on the subject published in 1985 alone.

3 The classic works are: Demas (1965), and Robinson (1963). See also: Selwyn (1975), Jalan (1982a), Lloyd (1968), Dommen and Hein (1985), Clarke and Payne (1987), and Harden (1985).

1. How is a small economy to be differentiated from a large one? More often than not, an arbitrary cut-off point such as an indigenous population of five or seven million is used as the delineating variable. Most often, the ultimate rationale for selecting a population figure is never made explicit.
2. If smallness is a constraint on development and growth, how can we measure this effect? Does it relate to the effectiveness of government programs and expenditures? The ability of the country to sustain growth through an expanding set of linkages to the domestic economy?
3. Based on I and 2, is there a critical minimum economic size of nations? If so, what is the magnitude of this dimension?

The purpose of this paper is to shed some light on these questions. Specifically, do small developing economics have a particular unique set of characteristics (other than size per set that tends to set them apart from developing countries as a whole?

2. NATURE OF THE PROBLEM

Is the economic structure of small nations so different from that of large nations that one should Kuznets (1959):

> devise variants of a theory of economic growth for the many small national units different from those for the few large ones; or can one hope to establish significant general features of modern economic growth by treating countries or different size as comparable an equivalent units.

Should one assume that (Demas, 1965):

> The alternatives open to small countries are more narrowly circumscribed than those of large countries ... so much theorizing about growth assumes a large closed economy, that it is important to differentiate sharply between the growth process in a large closed economy an in a small open economy, and that the study of development could be enriched if we make a distinction between large and small underdeveloped countries?

It is perhaps one of the more curious paradoxes that economists—theoretical and empirical—have had very little to say about how size may effect the "nature and causes of the Wealth of nations. (Lall and Ghosh, 1965, p.143). If one looks at the literature, it is necessary to go back to the 1957 international Economic Association conference (Robinson, 1963) as the first and perhaps only attempt to deal exclusively with this issue.

Among the earlier studies, that of William Demas (1965) on the particular problems confronting Caribbean economies is the most significant. Demas paid some attention to the development of what he called a "relevant analytical framework" without which a rational choice in the field of economic policy could not be made. An important point made by Demas was that the economic structure of small states was different from that of large countries, and that new analytical tools and concepts were necessary to consider their economic problems (Jalan, 1982, p.7).

Studies since Demas original work have helped to enhance our understanding of the structural characteristics of small countries and also the problems they face in promoting their economic development. There are however some important gaps. The "relevant analytical framework" to which Demas referred is still lacking, and we do not have a plausible or consistent theory of size as an independent factor in development.

3. PROBLEMS OF DEFINITION

Because of the lack of a uniform definition, most writers on small economies have been compelled to use arbitrary cut-off points in terms of population as a means of classification[4]. The use of different definitions and or populations cut off points in defining smallness has created difficulties in testing the validity of propositions regarding the structure and process of development in these economies. More importantly, because of a lack of comparability due to different definitions as to size, the conclusions of different writers on some important questions (e.g. the effects of size on the level of industrialization are extremely difficult to interpret).

Several approaches have been utilized to over-come these difficulties. Jalan (1982), for example, utilized a simple classification of countries by size based on a composite index of population, area and total GNP (as a proxy for capital stock). His underlying hypothesis is that differences in economic structure and performance among developing countries due to the size factor are likely to be due to differences in the resource base of countries.

However, Lloyd and Sundram (1982) have questioned the validity of combining separate indices on size on the ground that there is no logical basis for assigning weights to different factors. They point out that with few exceptions small economies chosen on the basis of the combined index are countries with populations less than five million (as there is a high correlation between population and the other measures of size). They therefore suggest that, from a statistical point of view, it may be sufficient to classify countries by population alone and that a dividing line of five million population may be reasonable for distinguishing large from small countries.

Several conference devoted to small economies have attempted to lay down definitional guidelines for smallness. For example (Jalan, 1982, p.7):

1. For a systematic examination of the problem and policies in small economies it is necessary to define the concept of smallness in a way which is likely to command general acceptance. In view of the difficulties involved in adopting a sharp and unique definition of small countries, it is also necessary to rely on as rough classification of countries by size. The data provided in the conference papers broadly supported the use of a working definition; of five million population for studying the problems of small countries.
2. Within the group of small economies defined in this manner, there is a need to distinguish between very small or "micro" states and other small economies. The problems of the micro states with very small populations and other resources were likely to be different and required separate consideration.
3. It was emphasized that generalizations regarding the problems of small economies as a group, should be avoided as far as possible because differences among countries within the groups could sometimes be as maked as intragroups differences; and
4. The relative size of countries was likely to affect the development options available to them; however it should be clearly recognized that in determining otherwise the development efforts, factors other than size were likely to be significant.

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4 Kuznets, (1963) used a population cut off point of ten million because this figure "provided a rough decision made with an eye to the distribution of nations by size as it exists today and has existed over the last 50-75 years. Demas (1965) defined small nations as countries that had populations of five million or less and with usable land area of 10 to 20 thousand square miles or less. Chenery and Syrquin (1975) split large from small countries on the basis of 15 million.

It was also pointed out that in some regions, the inter-linkages between different countries within the region were so important that problems of individual countries could not be studied without reference to the economy of the region.

Clearly there is no one specific definition of country size. Different population sizes, Gross Domestic Products and usable land areas have often been used. In actuality most writers on small economies have resorted to arbitrary cut-off points for each variable in distinguishing small from large countries. Obviously, the use of different definitions and or population cut off points is a major factor in contributing to the difficulty of arriving at broad generalizations concerning the functioning of these economies.

In the analysis that follows depart from the usual methods used in country classification. Instead of relying exclusively on GNP or population we develop through the use of factor analysis[5] a relative index of economic size. There are several advantages of this approach: (a) it incorporates all of the relevant dimensions of economic size— population, GNP and land area. This measure thus recognizes the multidimensional nature of economic size; (b) being a relative scale the index facilities the assessment of whether and to what extent small countries can be said to be distinguished from larger nations by a unique set of characteristics not associated with size per se; (c) from (a) and (b) it allows examination and possible identification of the threshold point separating large and small economies.

Previous analysis has suggested that, in part, differences in economic performance between large and small countries may stem from the relative effectives of government fiscal policy. More precisely, larger countries may be able to internalize to a greater extent the stimulus provided by expanded government expenditures (Looney, 1989, 1989a). Related research also indicates that these impacts are likely to vary considerably between non-defense and defense related expenditures (Looney, 1990, 1991).

Based on these consideration, twenty variables[6] reflecting economic performance, government expenditures and size were factor analyzed. The factor analysis[7] was undertaken in two stages: the first (Table 1) including defense expenditures and military variables and the second (Table 2) confided to non-defense allocations. Based on this analysis each of the sample countries[8] was ranked in terms of the major dimensions (Table I) in the data (Table 3)

5 For an example of the use of this technique in a non-size classification scheme see: Berlage and Terweduwe (1988).

6 Economic performance and size variables are from: World Bank (1990), Public expenditure, and military variables are from USACDA (1992). It should be noted that the government expenditures, military and size variables are the average values over the 1980-88 period. The economic performance figures are the average annual rates of growth over the indicated period.

7 For a detailed description of the procedures used and their interpretation see: Rummel (1970).

TABLE 1

DEVELOPING ECONOMIES: PATTERNS OF SIZE, GOVERNMENT DEFENSE EXPENDITURES AND ECONOMIC PERFORMANCE

(factor loadings)

Variable	Factorl	Factor2	Factor3	Factor4
	Lagged Growth	Defense Expendit	1980-88 Growth	Size
Imports 1965-80	0.904*	0.032	0.023	0.022
Investment 1970-80	0.859*	-0.027	-0.071	-0.006
GDP 1970-80	0.823*	0.017	0.209	-0.024
PublicCons 1970-80	0.661*	0.225	-0.148	0.073
Exports 1965-80	0.514*	0.018	0.255	0.122
Defense/GDP	0.068	0.955*	0.075	-0.077
Armed Forces/POP	0.143	0.838*	0.140	-0.068
Arms Imports/Imports	-0.012	0.667*	-0.048	0.054
Defense/Govemment Exp	0.151	0.647*	0.138	-0.082
Gov Expenditures/GDP	-0.093	0.621*	0.003	-0.027
Imports 1980-88	-0.105	0.058	0.835*	-0.018
GDP 1980-88	0.315	-0.033	0.814*	0.075
Investment 1980-88	-0.140	0.101	0.804*	0.054
Public Cons 1980-88	0.153	0.151	0.563*	0.183
Exports 1980-88	0.499	-0.021	0.536*	-0.022
GDP	0.124	-0.034	0.160	0.866*
Area	0.027	-0.100	-0.125	0.861*
Population	-0.162	-0.029	0.190	0.748
Eigen Value	4.118	2.908	2.500	1.860

Notes: See Appendix A for a complete description of variables. A varimax rotation was used to preform the factor analysis. See SPSS/PC+ Statistics 4.0 (Chicago: SPSS Inc, 1990).

TABLE 2

DEVELOPING ECONOMIES: PATTERNS OF SIZE, GOVERNMENT NON-DEFENSE EXPENDITURES AND ECONOMIC PERFORMANCE

(factor loadings)

Variable	Factorl	Factor2	Factor3	Factor4
	Lagged Growth	1980-88 Growth	Public Non-Defense Exp	Size
Imports 1965-80	0.910*	0.011	0.052	0.014
Investment 1970-80	0.845*	-0.0044	-0.169	-0.019
GDP 1970-80	0.826*	0.177	-0.149	-0.037
Public Cons 1970-80	0.717*	-0.169	0.093	0.023
Exports 1965-80	0.508*	0.253	0.081	0.153
GDP 1980-88	0.298	0.821*	-0.026	0.068
Imports 1980-88	-0.107	0.815*	0.111	-0.028
Investment 1980-88	-0.144	0.799*	-0.082	0.020
Public Cons 1980-88	0.111	0.632*	-0.022	0.195
Exports 1980-88	0.508*	0.52]*	0.144	-0.014
Gov Expenditures/GDP	0.033	0.001	0.965*	-0.022
Gov Non-Defense Exp/GDP	-0.017	-0.030	0.949*	0.013
Public Cons /GDP 1988	-0.032	0.051	0.727*	-0.104
GDP	0.131	0.139	0.052	0.875 *
Area	-0.023	-0.121	-0.052	0.863*
Population	-0.020	0.196	-0.124	0.732
Eigen Value	3.790	2.611	2.540	1.935

Notes: See Appendix A for a complete description of variables. A varimax rotation was used in the factor analysis. See SPSS/PC+ Statistics 4.0 (Chicago: SPSS Inc,1990).

TABLE 3

DEVELOPING ECONOMIES: COUNTRY RANKINGS IN SIZE, GOVERNMENT DEFENSE EXPENDITURES AND ECONOMIC PERFORMANCE

(factor scores)

Country	Factorl	Factor2	Factor3	Factor4
	Lagged Growth	Defense Expendit	1980-88 Growth	Size
Ethiopia	-1.627	2.240	0.389	0.403
Malawi	-0.161	-0.545	-0.173	-0.519
Somalia	-0.042	0.566	-0.669	-0.112
Madagascar	-1.620	-0.258	-0.351	-0.261
Burkina Faso	0.017	-0.531	1.371	-0.444
Mali	0.124	-0.514	0.741	-0.157
Burundi	-0.228	-0.401	1.163	-0.656
Nigeria	1.744	-0.645	-2.400	0.412
Zambia	-2.092	0.908	-0.842	-0.175
Niger	-0.003	-0.917	-1.207	0.036
Rwanda	0.820	-0.706	0.539	-0.602
India	-0.861	0.039	1.471	4.626
Pakistan	-0.551	0.353	1.900	0.179
Kenya	-0.260	-0.339	0.131	-0.313
Togo	0.310	-0.248	-0.588	-0.420
Central African Rep	-2.001	-0.688	0.856	-0.506
Benin	-0.111	-0.568	-0.210	-0.574
Ghana	-1.851	-0.969	0.354	-0.443
Indonesia	1.524	-0.530	0.170	1.032
Maurtania	0.119	0.597	-0.524	0.238
Sudan	-0.658	-0.520	-0.857	0.239
Liberia	-0.521	-0.206	-1.813	-0.322
Bolivia	0.072	-0.275	-1.925	-0.207
Philippines	0.316	-0.682	-0.872	-0.071
Yemen Arab Republic	3.223	0.799	-0.008	-0.744
Senegal	-0.686	-0.510	0.587	-0.611
Dominican Republic	-0.118	-0.863	0.553	-0.678
Ivory Coast	0.837	-0.732	-0.944	-0.468
Papua New Guinea	-1.015	-0.707	0.587	-0.410
Morocco	0.551	0.655	0.544	-0.251
Honduras	-0.151	-0.284	0.092	-0.474
Guatemala	0.115	-0.587	-0.596	-0.468

Note: Based on results in Table 1.

Country	Factorl Lagged Growth	Factor2 Defense Expendit	Factor3 1980-88 Growth	Factor4 Size
El Salvador	-0.466	0.260	-0.250	-0.479
Thailand	0.515	-0.286	1.600	-0.143
Cameroon	0.245	-0.818	1.064	-0.388
Jamaica	-1.959	-0.269	-0.428	-0.369
Ecuador	1.366	-0.540	-0.427	-0.457
Colombia	0.096	-0.826	0.253	-0.001
Paraguay	1.076	-0.889	0.677	-0.698*
Tunisia	1.120	-0.133	-0.134	-0.428
Turkey	0.432	0.206	1.661	-0.099
Peru	-0.694	0.502	-0.611	0.217
Chile	-0.739	0.037	-0.143	-0.157
Syria	1.648	3.986	-1.391	-0.104
Costa Rica	0.159	-0.953	0.383	-0.630
Mexico	0.499	-0.728	-0.791	1.150
Malaysia	0.499	-0.013	0.525	-0.378
Brazil	0.563	-0.539	-0.477	4.879
Nicaragua	-1.132	2.565	0.194	0.059
South Africa	-0.490	-0.062	-0.588	0.572
Alberia	1.101	0.067	-0.426	0.650
Uruguay	-0.252	-0.122	-0.883	-0.439
Argentina	-0.195	0.134	-1.500	1.287
Yugslovia	0.237	0.562	-0.016	-0.198
South Korea	2.116	0.034	2.814	0.035
Portugal	-0.261	0.135	0.487	-0.375
Greece	0.003	0.940	0.205	-0.147
Spain	-0.205	-0.245	1.198	1.539
Ireland	-0.270	-0.188	0.207	-0.390
Israel	-0.455	4.053	0.718	-0.320
Singapore	0.517	0.500	1.438	-0.621
Kuwait	0.880	0.443	-1.350	-0.224

Note: Based on results in Table 1.

Several pattern are apparent:

1. In both cases (defense and non-defense public expenditures), four main trends were identified by the factor analysis: (a) economic growth in the 1980s, (b) growth in the previous time period, (c) government expenditures, and (d) size.
2. In both factor analysis the size variable consisted of fairly equal contributions from GDP, population and area (as indicated by the respective factor loadings), with the highest correlations occurring between GDP and area.

Using structural, performance and government expenditure variables listed in Tables 4 and 5 as variables in a discriminant analysis, it was possible (through some trial and error) to correctly classify all of the sample countries as large or small. That is using the size index developed above (Factor 4, Table 1) to initially split the sample of developing countries into two groups (large and small) it was found that with a Factor 4 score of -0.15 or less for small countries and greater than -0.15 for large countries, the discriminating variables varied sufficiently between the two groups to enable the size grouping of all countries to be predicted with a 100% probability of correct placement. Using the -0.15 factor score as an initial value to delineate large and small countries it is interesting to note the way in which these groups differ:

TABLE 4

STRUCTURE OF DEMAND: LARGE AND SMALL THRID WORLD COUNTRIES

(Means)

Variable	Country Size		
	Small	Large	Total
Investment/GDP (1988)	19.6	21.2	20.3
Savings/GDP (1988)	15.4	17.8	16.4
Private Consumption/GDP (1988)	71.0	69.8	70.5
Resource Balance/GDP (1988)	-4.1	-3.3	-3.8
Exports/GDP (1988)	27.4	18.3	23.6
Imports/GDP (1988)	26.4	20.2	23.9
Public Consumption/GDP (1988)	13.6	12.4	12.1
Investment/GDP (1980)	22.7	23.9	23.2
Savings/GDP (1980)	15.4	17.8	16.4
Private Consumption/GDP (1980)	69.3	68.0	68.7
Resource Balance/GDP (1980)	-8.0	-5.1	-6.8
Public Consumption/GDP (1980)	25.5	13.1	20.4
Investment/GDP (1965)	17.7	16.8	17.3
Savings/GDP (1965)	14.4	13.8	14.1
Private Consumption/GDP (1965)	71.7	76.5	73.7
Resource Balance/GDP (1965)	-3.3	-2.9	-3.1
Exports/GDP (1965)	23.2	11.9	18.5
Public Consumption/GDP (1965)	13.9	9.6	12.1

ıurce: Data from: World Bank, World Development Report,1990 (New York: Oxford University Press, 1990).

ıte: Small countries are defined as those having a Factor 4 score (Table I) <-0.15. Large countries are those with Factor 4 scores > -0.15.

TABLE 5

PERFORMANCE PATTERNS OF LARGE AND SMALL THIRD WORLD COUNTRIES

Growth (average annual)			
GDP (1980-88)	1.9	2.9	2.3
Investment (1980-88)	-1.6	-1.3	-1.5
Exports (1980-88)	2.7	3.1	. 2.9
Imports (1980-88)	0.0	-0.6	-0.2
Government Cons (1980-88)	1.1	2.7	1.8
GDP (1970-80)	4.3	5.5	4.8
Investment (1970-80)	4.5	8.3	6.1
Exports (1965-80)	4.6	7.4	5.8
Imports (1965-80)	3.8	6.3	4.8
Government Cons (1970-80)	6.3	7.4	6.7
Debt (%)			
Long-Term Debt Service/GDP (1988)	7.2	5.5	6.5
Long-Term Debt Service/GDP (1980)	3.7	2.9	3.3
Long-Term Debt Service/GDP (1970)	3.1	2.0	2.8
LTDS/Exports (1988)	23.4	27.7	25.2
LTDS/Exports (1980)	13.4	12.4	13.0
LTDS/Exports (1970)	11.9	17.1	14.1
Long-Term Debt/GDP (1988)	80.3	56.9	70.6
Long-Term Debt GDP (1980)	33.0	23.6	29.1
Government Expenditures (%)			
Govt Exp/GDP (average 1980-88)	25.8	24.5	25.3
DefenseExp/GDP(av 1980-88)	3.1	4.5	3.7
Non-Defense Exp/GDP (av 1980-88)	22.8	19.9	21.6
Defense/Govt Exp (av 1980-88)	13.5	18.0	15.4
Non-Defense Exp/ Gove Exp (1980-88)	22.8	19.9	21.6

)tes: See Table 4 Government Expenditure data from: United States Arms Control and Disarmament Agency, World Military Expenditures and Arms Transfers (Washington, DC: USACDA, various years).

1. As expected, as evidenced by the share of exports and imports in GDP, smaller countries are much more open to world economic forces than their larger counterparts. While both large and small countries increased the share of international trade in their economies between 1965 and 1988, the gap between them narrowed over time. In terms of the resource balance, smaller countries also tended have a larger balance of payment deficits (relative to GDP).
2. Public consumption accounts for a larger share of small country GDP, although the difference between large and small countries narrowed in the 1980. Similarly the share of savings in GDP was somewhat lower in the smaller countries during the 1970s and 1980s. While private consumption accounted for a lower share of GDP in the smaller countries in 1965 (71.7% versus 76.5%), by 1988 its share was higher in the smaller countries (71.0 versus 69.8%).
3. In general the growth performances of the larger countries have been superior, with larger countries having a more rapid rate of GDP growth in both the 1970-80 periods and 1980-88 periods.
4. The debt service burden of smaller countries is a bit higher in terms of interest and principal payments as a shore of GDP, but lower in terms of the share of exports. The overall ratio of long term debt to GOP increased rapidly for both groups in the 1980s, with the smaller countries approximately tripling the debt/GDP ratio, while it doubled in the larger countries.
5. Small countries tend to have a larger share of demand accounted for by government expenditures. However this is largely confined to allocations to non-defense. The larger countries devote a considerably larger share of their budgets to defense. Defense also accounts for a relatively high share of demand in the larger countries.

4. IMPLICATIONS FOR GROWTH

These patterns particularly those relating to the growth in Gross Domestic Product, investment and exports are consistent with those found by Blazic-Metzner and Hughes (1982). In their examination of small countries Blazic-Metzner and Hughes found that during the period 1965-78, countries with populations more than five million grew faster as a group than those with populations of five million or less.

These findings run counter to the empirical work completed in the mid-1970s by Khalaf(1979). In fact Khalaf's empirical work led him to the conclusion that smallness is not necessarily associated with a unique set of developmental outcomes:

1. There is no discernible association between country size and economic development, nor between country size and economic growth, and that neither the dependence on trade of small countries nor their commodity and geographic export concentration are necessarily important factors in economic growth and development (Khalaf, 1979, p.67), and
2. There is no relationship between country size and income instability, nor between country size and export instability. Furthermore there is no relationship between income instability and dependence on trade, nor between income instability and export concentration (both commodity and geographic) (Khalaf, 1976, p.427).

3. The implication of these results on small countries are significant. If small countries, by virtue of their size have high dependence on trade and high export concentration, then neither their dependence on trade nor their export concentration is expected to be a source of extra income instability or extra export instability. This latter result could also mean that policies often aimed at increasing the diversity of exports; may not have the desired effect of reducing the instability of export proceeds.

While interesting, Khalaf's results give us only a partial insight into the unique problems small countries have in sustaining growth over several decades. At least for the period before the 1970s, the general tendency among developing countries was for the aggregate growth rates of individual countires to be rather similar from one decade to the next.

Drawing on data for the 1950s and 1960s, Jeffrey Nugent (1977)[8] found that the majority of developing countries were either consistently higher or consistently lower than the average for the group as a whole during each decade. More precisely, 15 out of the 42 countries examined in his study had GNP growth rates less than the average for the group during both time periods. On the other hand 21 countries sustained growth rates above the 42 country group average for both the 1950s and 1960s.

From these results it appears that once a certain degree of growth momentum has been attained, continued growth is relatively easy to maintain. Without such momentum, however, the growth process seems relatively difficult to initiate and sustain over time. Thus Nugent concluded that countries that are not able to generate much growth in one decade have a low probability of doing significantly better than in the next; incomes that are growing relatively rapidly continue to do so over time while those countries that are growing at a relatively slow rate tend to perpetuate this pattern from one decade to the next. Nugent did not delineate his sample of countries by size, however. Based on the descriptive analysis above (Tables 4 and 5) it is apparent that small and large countries may vary considerably in their ability to achieve and maintain momentum. To test the Nugent Thesis for our groups of small and large countries, a growth equation was specified whereby economic expansion (GDPG8088) in the 1980 (1980-88) is a function of:

1. The rate of growth of capital formation in the same time period (GDIG8088);
2. The Nugent effect—the rate of growth in GDP in previous decade (GDPG 7080) — to what extend to countries sustain growth from one decade to another?.
3. A policy variable—the role of the public sector in the economy (as proxied by the factor score on: (a) government non-defense expenditures and (b) govemment defense expenditures. Here we are interested in examining the efficacy of government expenditures in stabilizing the pattern of economic growth.

The analysis was undertaken in four parts (Table 6-9). The first set of regressions examined the growth patterns of large and small countries in the context of non-defense government allocations, while the second set of regressions examined the impact of defense expenditures on growth rates in both large and small countries. In each case various degrees of "smallness" and "largeness" were used to determine the sensitivity of the findings to the manner in which small countries were delineated from their larger counterparts. In all cases alternative country groupings were based on the factor score of the size dimension in Table 1. Because of sample size considerations, the factor score on the size factor varied from 0 to -0.15 to 0.30.

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8 Nugent (1977). See also Looney and Frederiksen (1988).

Several interesting patterns are apparent:

1. As suggested by Nugent, large developing countries appear (Table 6) capable of sustaining growth momentum from one time period to another—this pattern held across three alternative definitions of size, with the coefficient of the GDPG7080 country quite stable. On the other hand non-military government expenditures in these countries does not appear to play a critical role in affecting the overall growth process. Instead, growth is largely a function of the attained rate of capital expansion.
2. In contrast, to their larger counterparts, the smaller countries (Table 7) have not been able to sustain growth from one time period to another. That is for the countries with a factor score of <0, growth in the 70s was only marginally significant in affecting the expansion of GDP in the 1980s. When smallness is defined as a factor score less the -0.15 past growth is no longer statistically significant at the 95% level. It should also be noted that once smallness is confined to those countries with a size factor score less than -0.30 none of the independent variables were significant in explaining the observed rate of GDP growth in the 1980s.
3. An interesting pattern (Table 8) develops when non-defense expenditures are replaced by the factor scores reflecting militarization. In the case of the larger countries, momentum is still an important and positive contributor to growth. However, military expenditures tended to suppress their expansions in the 1980s. That is ceteris paribus countries with higher levels of defense expenditure — arms imports and the like tended to have lower rates of growth.
4. Again this pattern did not apply to the smaller countries, where defense expenditures were statistically insignificant (Table 9) in explaining differences in growth patterns.
5. The best results in temms of correctly classifying countries based on their initial factor scores came with the size factor country scores greater and less than -0.15. That is countries above an below this number could be grouped in fairly homogenous categories based on their economic structure, performance and govemment expenditure patterns.

5. CONCLUSIONS

The empirical findings noted above help to provide answers to the questions posed earlier:

1. How is a small economy to be differentiated from a large one. The creation of a index size based on GDP, population and area avoids some of the more arbitrary definations previously used. In addition this particular index can subsequently be used to define smallness in terms of some sort of performance/policy mix measure.
2. Smallness appears to be a constraint of growth in two regards—momentum and the effectiveness of government expenditures. Small countries can be defined as those states not capable of sustaining momentum from one time period to another and or those countries not capable of stimulating economic growth through cutting defense expenditures.

3. Is there a critical minimum economic size of nations? Yes if we look at size in terms of economic performance and policy effectiveness. Small countries are those nations with an equivalent size factor score of less than -0.15. This places them in a group of countries not sustaining growth from one decade to another and simultaneously not capable of stimulating their economies through altering the pattern of government expenditures—they are countries whose growth is largely outside their control.

TABLE 6

ECONOMIC GROWTH, MOMENTUM AND NON-MILITARY GOVERNMENT EXPENDITURES: LARGE DEVELOPING COUNTRIES, 1980-1988

(standardized regression coefficients)

LARGE COUNTRIES

FACTOR 4 (SIZE) > O; FACTOR3 = GOVERNMENT NON-MILITARY EXP

1. GDPG8088 = 0.87 GDIG8088 + 0.23 GDPG7080 - 0.08 FACTOR3
(17.51) (4.70) (-1.70)
df = 7; F = 168.52; r2(adj) =0.980
correct placement = 91.7% (11/12)

FACTOR 4 (SIZE) > -0.15; FACTOR3 = GOVERNMENT NON-MILITARY EXP

2. GDPG8088 = 0.83 GDIG8088 + 0.31 GDPG7080 - 0.09 FACTOR3
(13.54) (4.79) (-1.50)
df = 15; F = 90.89; r2(adj) =0.937
correct placement = 100% (19/19)

FACTOR 4 (SIZE) > -0.30; FACTOR3 = GOVERNMENT NON-MILITARY EXP

3. GDPG8088 = 0.81 GDIG8088 + 0.35 GDPG7080 - 0.01 FACTOR3
(11.13) (4.60) (-0.16)
df = 20; F = 59.1; r2(adj) =0.883
correct placement = 96.0 (24/25)

Notes: FACTOR3 AND FACTOR4 are country scores obtained from the relevant factor analysis. GDPG8088= the growth in real Gross Domestic Product between 1980 and 1988. GDPG7080 = the growth in Real Gross Domestic product between 1970 and 1980. GDIG8088 the growth in real capital fommation between 1980 and 1988; df = degrees of freedom; F = F statistic; ( ) = t statistic; r^2 (adj) = the adjusted coefficient of determination. Correct placement refers to the percentage of countries correctly grouped through a discriminant analysis of the pre-specified Factor 4 split.

TABLE 7

ECONOMIC GROWTH, MOMENTUM AND NON-MILITARY GOVERNMENT EXPENDITURES: SMALL DEVELOPING COUNTRIES,1980-1988

(standardized regression coefficients)

SMALL COUNTRIES

FACTOR4 (SIZE) < 0; FACTOR3 = GOVERNMENT NON-MILITARY EXP

1. GDPG8088 = 0.62 GDIG8088 + 0.32 GDPG7080 + 0.15 FACTOR3
(4.24) (2.18) (1.02)
df = 33; F = 6.56; r2(adj) =0.317
correct placement = 89.5% (34/38)

FACTOR4 (SIZE) < -0.15; FACTOR3 = GOVERNMENT NON-MILITARY EXP

2. GDPG8088 = 0.57 GDIG8088 + 0.34 GDPG7080 + 0.25 FACTOR3
(3.17) (1.96) (1.38)
df = 23; F = 3.99; r2(adj) =0.257
correct placement = 100% (27/27)

FACTOR4 (SIZE) < -0.30; FACTOR3 = GOVERNMENT NON-MILITARY EXP

3. GDPG8088 = 0.38 GDIG8088 + 0.14 GDPG7080 + 0.14 FACTOR3
(1.85) (0.69) (0.68)
df = 20; F = 1.52; r2(adj) = 0.038
correct placement = 96% (24/25)

Notes: FACTOR3 AND FACTOR4 are country scores obtained from the relevant factor analysis. GDPG8088= the growth in real Gross Domestic Product between 1980 and 1988. GDPG7080 = the growth in Real Gross Domestic product between 1970 and 1980. GDIG8088 the growth in real capital formation between 1980 and 1988; df = degrees of freedom; F = F statistic; ( ) = t statistic; r2(adj) = the adjusted coefficient of determination. Correct placement refers to the percentage of countries correctly grouped through a discriminant analysis of the pre-specified Factor 4 split.

TABLE 8

ECONOMIC GROWTH, MOMENTUM AND GOVERNMENT MILITARY EXPENDITURES: LARGE DEVELOPING COUNTRIES 1980-1988

(standardized regression coefficients)

LARGE COUNTRIES

FACTOR4 (SIZE) > O; FACTOR2 = GOVERNMENT MILITARY EXP

1. GDPG8088 = 0.94 GDIG8088 + 0.21 GDPG7080 - 0.21 FACTOR2
(12.33) (2.82) (-2.66)
df = 8 F = 108.36; r(adj) =0.966
correct placement = 100% (13/13)

FACTOR4 (SIZE) > -0.15; FACTOR2 = GOVERNMENT MILITARY EXP

2. GDPG8088 = 0.94 GDIG8088 + 0.19 GDPG7080 - 0.33 FACTOR2
(18.51) (3.79) (-6.74)
df = 15 F= 139.73; r2(adj) =0.959
correct placement = 100% (20/20)

FACTOR4 (SIZE) > -0.30; FACTOR2 = GOVERNMENT MILITARY EXP

3. GDPG8088 = 0.87 GDIG8088 + 0.27 GDPG7080 - 0.28 FACTOR2
(12.18) (3.81) (-3.89)
df = 22 F = 62.41; r^2(adj) =0.881
correct placement = 100% (27/27)

Notes: FACTOR3 AND FACTOR4 are country scores obtained from the relevant factor analysis. GDPG8088= the growth in real Gross Domestic Product between 1980 and 1988. GDPG7080 = the growth in Real Gross Domestic product between 1970 and 1980. GDIG8088 the growth in real capital formation between 1980 and 1988; df = degrees of freedom; F = F statistic; ( ) = t statistic; r(adj) = the adjusted coefficient of determination. Correct placement refers to the percentage of countries correctly grouped through a discriminant analysis of the pre-specified Factor 4 split.

TABLE 9

ECONOMIC GROWTH, MOMENTUM AND GOVERNMENT MILITARY EXPENDITURES: SMALL DEVELOPING COUNTRIES,1980-1988

(standardized regression coefficients)

SMALL COUNTRIES

FACTOR4 (SIZE) < O; FACTOR2 = GOVERNMENT MILITARY EXP

1. GDPG8088 = 0.59 GDIG8088 + 0.29 GDPG7080 - 0.20 FACTOR2
(4.47) (2.18) (-1.49)
df = 34 F = 8.29; r2(adj) =0.371
correct placement = 89.7% (35/39)

FACTOR4 (SIZE) < -0.15; FACTOR2 = GOVERNMENT MILITARY EXP

2. GDPG8088 = 0.51 GDIG8088 + 0.29 GDPG7080 - 0.07 FACTOR2
(2.92) (1.66) (-0.41)
df = 25 F = 3.88; r(adj) =0.236
correct placement = 96.7% (29/30)

FACTOR4 (SIZE) < -0.30; FACTOR2 = GOVERNMENT MILITARY EXP

3. GDPG8088 = 0.21 GDIG8088 + 0.16 GDPG7080 - 0.21 FACTOR2
(0.81) (0.64) (-0.86)
df = 18 F = 0.941 r^2(adj) =0.006
correct placement = 100.0% (23/23)

otes: FACTOR3 AND FACTOR4 are country scores obtained from the relevant factor analysis. GDPG8088= the growth in real Gross Domestic Product between 1980 and 1988. GDPG7080 = the growth in Real Gross Domestic product between 1970 and 1980. GDIG8088 the growth in real capital formation between 1980 and 1988; df = degrees of freedom; F = F statistic; ( ) = t statistic; r^2 (adj) = the adjusted coefficient of determination. Correct placement refers to the percentage of countries correctly grouped through a discriminant analysis of the pre-specified Factor 4 split.

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