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Financial Policies and Macroeconomic Performance of Developing Countries

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Summary

This paper focuses on three types of financial policies that have featured prominently in macroeconomic adjustment in developing countries. The paper investigates whether there is a basis for believing that, over the period 1976-83, relative economic performance of countries as regards inflation, the current account balance and growth was significantly associated with the relative application of policy measures relating to domestic credit expansion per unit of output, fiscal balance (as a percent of gross domestic product) and changes in the effective exchange rate.

Seventy-two developing countries, for which all the relevant data were available, constitute the sample. Changes in percentage points are computed for the six policy and target variables for the years 1976-83, for two-year, three-year, and four-year periods. A nonparametric rank-sum test is used to investigate whether differences in mean policy changes are related to differences in mean changes in economic performance.

It is found that expansion of domestic credit per unit of real output is the important policy variable most closely associated with inflation. Both relative improvement in the fiscal balance (as a percent of GDP) and relative depreciation of the real effective exchange rate are associated with relative improvement in the current account balance as a percent of exports. Relative growth performance is found, in one third of the comparisons, to be significantly and positively associated with relative depreciation of the real effective exchange rate. Generally, growth performance is also inversely related to the rate of change of the domestic credit per unit of output.

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The theoretical reasons for expecting these empirical findings are discussed. In particular, there is an especially strong theoretical basis for expecting that domestic credit expansion tends to aggravate inflation; fiscal improvement tends to help the current account; and real effective exchange rate depreciation tends to be favorable to growth and to the current account. Nevertheless, circumstances in which these relationships may not hold are also discussed.

I. Introduction

The aim of macroeconomic adjustment in developing countries is generally to achieve reductions in inflation and improvement in the external current account balance while not adversely affecting economic growth. Various financial and other policy measures are used to achieve these targets (see, e.g., Crockett (1981), and Khan and Knight (1982)). In this paper, the focus is on three financial policy variables that have featured prominently in this regard, viz., the fiscal balance (FB) in relation to nominal gross domestic product (GDP) (i.e., the change in the ratio FB/Y , where Y is nominal GDP), the growth rate of domestic credit (DC) relative to that of real GDP (y) (i.e., the rate of change of the DC/y ratio), and the real effective exchange rate (RER).

Improvement in fiscal balance, reduction in credit expansion, and real effective exchange rate depreciation are by no means the only adjustment measures that countries have implemented to reduce internal and external imbalances. For example, both the level and structure of interest rates have often been adjusted with a view to raising national saving-income ratios, thereby improving current account balances and reducing inflation; 1/

1/ The issue of the interest elasticity of savings in developing countries remains unsettled, partly because it is not easy to empirically detect this elasticity. For a recent critique of the available evidence, see Giovannini [1983]. Khatkhate (1985) also discusses some conceptual and empirical issues important in judging the appropriateness of the level of nominal interest rates. On another plane, structuralists argue that, at least in the (very) short run, the fact that interest rates are important in cost functions could lead to rising interest rates having an inflationary effect. Nevertheless, in such models [see e.g., Taylor (1983) Ch. 5] an increase in the interest rate has an ambiguous effect on the price level; it pushes up the price level by increasing working-capital costs and reduces it by cutting back on investment demand. In this sort of model the pure saving effect of interest rate changes is suppressed, not necessarily (or not only) because the interest rate elasticity of saving is considered low, but, as this author understands it, because the investment and saving decisions are not sufficiently separated. In contrast, models in the McKinnon (1973) and Shaw (1973) tradition [see e.g., Fry (1980) and (1982)] stress the money demand effect of the real deposit rate (defined as the difference between the interest rate on financial deposits and the expected inflation). The more important is (broad) money as an asset in which savings are held, the more important becomes the inflation-dampening effect of raising interest rates.

such interest rate policies further promote financial intermediation and enhance the efficiency of allocation of savings, and facilitate increased growth of output (see e.g., Lanyi and Saracoglu (1983), McKinnon (1973), Shaw (1973)). Various other policies have also aided in reducing absorption relative to income, as well as augmenting the efficiency of resource allocation with favorable impact on economic growth. Notable have been wage measures that seek to break a wage-price spiral; modification of the level and structure of public utility rates, and of petroleum and other controlled prices; rationalization of external tariff rates and of public investment (see e.g., World Economic Outlook 1984, Chapter III). In addition to their direct macroeconomic effects, these auxiliary measures support the broad policies being highlighted in this paper. First, these measures facilitate achievement of the desired changes in fiscal balances, domestic credit expansion and effective exchange rate. Second, these auxiliary measures enhance the positive employment and output developments accompanying the fiscal, credit, and exchange rate changes.

Apart from the fact that policy measures other than those being highlighted in this paper also affect inflation, the current account, and growth, certain factors usually considered outside the immediate influence or control of national policymakers also have significant impact on these three adjustment targets. These factors include natural disasters, political and labor unrest, or sharp changes in the commodity terms of trade, in interest rates in international financial markets, and in oil prices ^{1/}

In assessing the effects of policies, it is necessary to choose appropriate measures of adjustment. While in principle the rate of growth of output is a straightforwardly observed measure, there are problems in choosing quantitative criteria for the other two adjustment objectives. The conventional criteria are a decline in the rate of inflation and improvement in the current account balance relative to exports of goods and services (current account ratio). But these criteria must be interpreted with great care. While declining inflation would be an appropriate criterion in a medium-term context, it would be mistaken to gauge the adjustment effort by the inflation performance in the short term without reference to the specific policies being implemented. Because the process of adjustment has often required initial increases in administered official prices, liberalization of controlled market prices, reduction of subsidies and sizable depreciation of nominal exchange rates, an adjustment program has often led to an initial rise in inflation. In such circumstances, the credit restraint required to avoid such higher inflation may not be undertaken because it would result in lower levels of real output and employment.

^{1/} For shocks emanating from the world economy in the 1970s see, for example, Cline (1981) and Khan and Knight (1983).

Care is also necessary in interpreting changes in the current account as an indicator of adjustment. ^{1/} In many developing countries, restrictions are used to reduce imports to a level that is in line with the availability of foreign exchange. The latter, in turn, depends, in substantial part, on the magnitude of capital flows, which are affected by perceptions of recipient countries' policies and overall economic prospects. A country that introduces policies that are widely regarded as appropriate, and whose authorities are expected to pursue those policies vigorously, is more likely, under normal circumstances, to obtain substantial net capital inflows, compared with a country for which perceptions are the reverse. The resulting widening of the current account deficit that may result from such inflows makes it difficult to assess the adjustment effort by looking only at the changes in the external current account ratio. Despite these qualifications for individual countries, a good indication of the overall success in adjustment of a group of developing countries can be obtained by examination of changes in the external current account ratio and inflation rates. This would be especially true, the longer the period being considered.

This paper explores the relationship between relative economic performance of countries and relative financial restraint. ^{2/} The approach is twofold. Given a relatively favorable outcome for inflation or the current account ratio, or economic growth, to what extent was this related to relatively contractionary credit policy, or relative fiscal improvement, or real effective exchange rate depreciation? Alternatively, to what extent was a given relative improvement in the fiscal balance, relative contraction in domestic credit expansion, or relative depreciation of the real effective exchange rate associated with relatively good performance with regard to inflation, the current account ratio, and growth of real GDP? The following section (II) discusses the methodology used in the paper, while Sections III - V discuss both the empirical findings and the underlying theoretical issues relating to inflation, the current account and growth respectively. Section VI makes some brief concluding remarks.

II. The Methodology

This paper investigates whether there is a basis for believing that over the period 1976-83, relative economic performance as regards inflation, the current account and growth was related in any significant way to policy measures with regard to domestic credit expansion per unit of output,

^{1/} Note that what is at issue here is the change in the current account ratio not the level of the ratio.

^{2/} Throughout this paper, unless otherwise indicated, "relative" and "relatively" refer to intercountry comparison.

fiscal balance per unit of GDP and the real effective exchange rate. Alternatively, the issue is whether other exogenous and other policy variables were so much more importantly correlated with the performance variables as to have neutralized any (relatively weak) correlation between the policy variables and the performance variables examined here. The 72 countries included in the study were those countries among the non-oil developing countries for which all the relevant data were available during the years 1976-83.

Changes (in percentage points) were computed for the six variables for the years 1976-83. ^{1/} The changes were computed from one period to another for periods of two years, three years, and four years; there were four two-year periods, four three-year periods and two four-year periods. Countries were assigned to a "lower half" or "higher half" subgroup depending on whether the change for the criterion in question was smaller or greater than the median for the group of 72 countries as a whole. As there were three policy variables and three performance variables, there were six criteria by which countries could be divided. For instance, when the criterion was the current account balance, the "higher half" subgroup comprised those countries that experienced a greater improvement in current account performance than the median, and vice versa for the "lower half" subgroup. When the criterion was the exchange rate, the "lower half" subgroup consisted of countries that experienced greater depreciation or smaller appreciation than the median, and vice versa for the "higher half" subgroup. With the division into lower and higher halves by use of the median, the differences of the subsamples, as far as the mean value for the criterion in question was concerned, were statistically significant at the 99 percent confidence level. In the set-up of Tables 1-6, to facilitate ease of reading and understanding, the half that would be intuitively considered as having a "better" performance or policy is always placed on top.

To test whether differences of mean policy changes were related to differences in mean changes in economic performance, a nonparametric rank-sum test--the U test or Mann-Whitney test--was used. Without the requirement of the assumption of normal distribution of the populations, the U test enables one to test the null hypothesis that the two subsamples

^{1/} Changes were computed as follows for each of the 72 countries:

- a. changes from average for 1976-77 to average for 1978-79;
- b. changes from average for 1978-79 to average for 1980-81;
- c. changes from average for 1980-81 to average for 1982-83;
- d. changes from average for 1976-78 to average for 1979-81;
- e. changes from average for 1978-80 to average for 1981-83;
- f. changes from average for 1976-79 to average for 1980-83.

have the same mean. 1/ The test involves arranging the values of the two subsamples jointly, in increasing order of magnitude, with respect to the characteristic for whose difference the subsamples are to be tested. If there is an appreciable difference between the means of the two subsamples, most of the lower ranks will tend to go to one subsample and most of the higher ranks to the other. The statistical testing procedure is similar to that of the usual method of testing for the difference of two means. The rank sum of either subsample (U_i) is compared to what its expected value $E(U_i)$ would be if there were no difference in the rank sums (and hence means) of the two subsamples; the difference between U_i and $E(U_i)$ is then computed as a multiple of the standard error of U_i (the latter being for the case where both subsamples originate from the same population and hence have the same mean and variance). With the subsamples greater than eight, the usual assumption is that the distribution of U_i is approximately normal, enabling use of the usual statistical tables for the significance tests. In the tables 1 - 6 of this paper, single star (*) represents significance at the 90 percent level, two stars (**) significance at the 95 percent level, and three stars (***) significance at the 99 percent level.

Only general relations that are widely regarded as interesting and that have formed the basis for financial programs are being examined in this paper. Rather than estimating parameters relating policy variables and targets, the aim of the study is to discover whether the relative performance of countries differed significantly and whether significant differences were related in a significant way to the policies implemented relative to those implemented in other countries. 2/ Again, it is useful

1/ A description of this test is to be found in any general statistical text. See, e.g., Freund, John E. and Ronald E. Walpole (1980), pp. 480-486.

2/ Alternatively, the issue could be stated as follows. Suppose that from general theory and available evidence it is believed that the following holds:

$Y = f(x, W)$ such that $f_1' > 0$, where Y is a target, x is an instrument and W is, say, an exogenous variable such as external terms of trade. Suppose one has much control over x but that either one has very little control over W or believes that W is in any case not very important in affecting Y . Let x_A and x_B be the amounts of x in "countries" A and B, respectively and Y_A and Y_B the amounts of Y in "countries" A and B, respectively. Suppose now that $\frac{d(Y_A/Y_B)}{dt}$ was significantly positive, where

t is time and d is the derivative. The issue is to find out whether it was also the case that $\frac{d(x_A/x_B)}{dt}$ was significantly positive. Conversely, suppose

that it is observed that $\frac{d(x_A/x_B)}{dt}$ was significantly positive, then was it also

the case that $\frac{d(Y_A/Y_B)}{dt}$ was significantly positive?

Table 1. Developing Countries: Cross-Classified by Economic Performance and Policy

(Changes from average for 1976-77 to average for 1978-79, in percentage points)

	Mean Change, for Half-Group Identified in Stub, in:						
	Rate of inflation <u>2/</u>	Current account balance in percent of exports of goods and services <u>3/</u>	Growth of real GDP <u>4/</u>	Rate of expansion of domestic credit per unit of real GDP <u>5/</u>	Ratio of fiscal balance to GDP <u>6/</u>	Nominal effective exchange rate <u>7/</u>	Real effective exchange rate <u>7/</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Countries classified by magnitude of changes in:							
1. Rate of inflation <u>2/</u> (Median change = 2.2)							
Lower half	(-7.8***)	-8.0	-1.8	0.9*	0.2	-9.4	0.9*
Higher half	(8.4***)	-9.2	-2.7	10.0*	0.2	-7.5	-2.5*
2. Current account balance in percent of exports of goods and services <u>3/</u> (Median change = -7.9)							
Higher half	-1.2	(11.2***)	-3.1	-0.5**	2.3***	-14.4**	-2.6*
Lower half	1.8	(-28.4***)	-1.4	11.4**	-1.9***	-2.5**	1.1*
3. Growth of real GDP <u>4/</u> (Median change = -1.4)							
Higher half	-1.9	-5.7	(2.4***)	1.0*	0.5*	-13.9**	-3.7*
Lower half	2.5	-11.5	(-6.9***)	9.9*	0.0*	-3.1**	2.1*
4. The rate of expansion of domestic credit per unit of real GDP <u>5/</u> (Median change = 1.9)							
Lower half	0.7*	-1.9**	-0.3***	(-14.0***)	1.2**	-9.1	-1.4
Higher half	0.0*	-15.3**	-4.1***	(24.9***)	-0.8**	-7.8	-0.1
5. Ratio of fiscal balance to GDP <u>6/</u> (Median change = 0.2)							
Higher half	-1.3	1.6***	-2.2**	-4.1***	(3.0***)	-13.2**	0.9
Lower half	1.9	-18.8***	-2.3**	15.0***	(-2.6***)	-3.8**	-2.5
6. Nominal effective exchange rate <u>7/</u> (Median change = -3.8)							
Lower half	-0.8	-2.4**	-2.9	7.8	0.8**	(-18.8***)	-2.9
Higher half	1.5	-14.8**	-1.6	3.1	-0.3**	(1.9***)	1.4
7. Real effective exchange rate <u>7/</u> (Median change = -2.9)							
Lower half	3.3*	-3.0*	-1.0**	2.4	0.0	-10.3*	(-10.2***)
Higher half	-2.7*	-14.2*	-3.4**	8.5	0.4	-6.7*	(8.6***)

1/ The sample contains 72 countries. Asterisks indicate statistically significant differences—at the 90 percent (*), 95 percent (**), or 99 percent (***) confidence level—between the pairs of half-groups (of 36 countries each) identified in the stub. A nonparametric (rank-sum) test—the Mann-Whitney U test—was used for assessing statistical significance.

2/ Measured by consumer price indices. A minus sign indicates a reduction in the rate of inflation.

3/ A minus sign indicates an increase in the current deficit, or a reduction in the current surplus, relative to the value of exports of goods and services.

4/ A minus sign indicates a reduction in the growth rate of real GDP.

5/ Calculated as the change (in percentage points) in the annual average percentage change of the ratio of domestic credit to real GDP. A minus sign indicates a shift to a less expansionary credit policy.

6/ A minus sign indicates an increase in a deficit or a reduction in a surplus.

7/ Average effective exchange rates for 1976-77 are set equal to 100. A minus sign indicates depreciation.

Table 2. Developing Countries: Cross-Classified by Economic Performance and Policy

(Changes from average for 1978-79 to average for 1980-81, in percentage points)

	Mean Change, for Half-Group Identified in Stub, in:						
	Rate of inflation <u>2/</u>	Current account balance in percent of exports of goods and services <u>3/</u>	Growth of real GDP <u>4/</u>	Rate of expansion of domestic credit per unit of real GDP <u>5/</u>	Ratio of fiscal balance to GDP <u>6/</u>	Nominal effective exchange rate <u>7/</u>	Real effective exchange rate <u>7/</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Countries classified by magnitude of changes in:							
1. Rate of inflation <u>2/</u> (Median change = 3.4)							
Lower half	(-3.4***)	-11.4	-0.2*	-5.2*	-1.4	-1.7	5.1
Higher half	(12.4***)	-2.9	-2.3*	4.4*	-0.3	-5.6	8.5
2. Current account balance in percent of exports of goods and services <u>3/</u> (Median change = -5.6)							
Higher half	7.5	(9.9***)	-1.9	-1.3	0.0*	0.5*	2.9**
Lower half	1.6	(-24.3***)	-0.6	0.4	-1.7*	-7.8*	10.7**
3. Growth of real GDP <u>4/</u> (Median change = -1.0)							
Higher half	3.8	-10.5	(3.0***)	-1.4	-0.9	-3.8	7.2
Lower half	5.2	-3.9	(-5.5***)	0.6	-0.8	-3.6	6.3
4. The rate of expansion of domestic credit per unit of real GDP <u>5/</u> (Median change = 1.1)							
Lower half	1.0**	-6.6	0.1*	(-17.5***)	0.1**	-4.4*	5.7
Higher half	8.1**	-7.7	-2.6*	(16.6***)	-1.7**	-3.0*	7.8
5. Ratio of fiscal balance to GDP <u>6/</u> (Median change = -0.7)							
Higher half	3.6	-1.8*	-0.7	-6.5**	(1.7***)	-2.8	7.9
Lower half	5.5	-12.6*	-1.8	5.6**	(-3.4***)	-4.6	5.7
6. Nominal effective exchange rate <u>7/</u> (Median change = 0.9)							
Lower half	5.4	-9.6	-1.2	-0.9	-1.1	(-15.1***)	6.6
Higher half	3.6	-4.7	-1.3	0.1	-0.6	(7.7***)	6.9
7. Real effective exchange rate <u>7/</u> (Median change = 4.2)							
Lower half	3.5	-3.1	-2.4	0.0	-0.9	-4.5*	(-3.1***)
Higher half	5.5	-11.3	-0.1	-0.8	-0.8	-2.8*	(16.6***)

1/ The sample contains 72 countries. Asterisks indicate statistically significant differences--at the 90 percent (*), 95 percent (**), or 99 percent (***) confidence level--between the pairs of half-groups (of 36 countries each) identified in the stub. A nonparametric (rank-sum) test--the Mann-Whitney U test--was used for assessing statistical significance.

2/ Measured by consumer price indices. A minus sign indicates a reduction in the rate of inflation.

3/ A minus sign indicates an increase in the current deficit, or a reduction in the current surplus, relative to the value of exports of goods and services.

4/ A minus sign indicates a reduction in the growth rate of real GDP.

5/ Calculated as the change (in percentage points) in the annual average percentage change of the ratio of domestic credit to real GDP. A minus sign indicates a shift to a less expansionary credit policy.

6/ A minus sign indicates an increase in a deficit or a reduction in a surplus.

7/ Average effective exchange rates for 1978-79 are set equal to 100. A minus sign indicates depreciation.

Table 3. Developing Countries: Cross-Classified by Economic Performance and Policy

(Changes from average for 1980-81 to average for 1982-83, in percentage points)

		Mean Change, for Half-Group Identified in Stub, in:						
		Rate of inflation <u>2/</u>	Current account balance in percent of exports of goods and services <u>3/</u>	Growth of real GDP <u>4/</u>	Rate of expansion of domestic credit per unit of real GDP <u>5/</u>	Ratio of fiscal balance to GDP <u>6/</u>	Nominal effective exchange rate <u>7/</u>	Real effective exchange rate <u>7/</u>
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Countries classified by <u>magnitude of changes in:</u>								
1. Rate of inflation <u>2/</u> (Median change = -3.3)								
Lower half		(-11.6***)	-2.3	-1.7	-7.2***	-0.4	1.5	-0.7
Higher half		(14.6***)	-1.6	-2.2	31.4***	-1.4	-10.6	6.7
2. Current account balance in percent of exports of goods and services <u>3/</u> (Median change = -2.0)								
Higher half		0.8	(13.9***)	-1.1	-2.1**	0.8***	-9.1	-4.3***
Lower half		2.2	(-17.7***)	-2.8	26.2**	-2.5***	-0.1	10.3***
3. Growth of real GDP <u>4/</u> (Median change = -2.1)								
Higher half		-2.0	2.0*	(1.9***)	-3.5***	-0.4	-3.7	-0.3
Lower half		5.0	-5.9*	(-5.8***)	27.7***	-1.4	-5.4	6.3
4. The rate of expansion of domestic credit per unit of real GDP <u>5/</u> (Median change = 0.2)								
Lower half		-6.9**	2.6*	0.1***	(-14.2***)	0.2***	-3.0	1.5
Higher half		9.9**	-6.4*	-4.0***	(38.4***)	-1.9***	-6.2	4.6
5. Ratio of fiscal balance to GDP <u>6/</u> (Median change = -0.4)								
Higher half		-1.0	4.5***	-0.9	-3.7***	(2.1***)	-11.7**	-1.4*
Lower half		4.0	-8.3***	-3.0	27.9***	(-3.9***)	2.5**	7.5*
6. Nominal effective exchange rate <u>7/</u> (Median change = -1.2)								
Lower half		6.4	5.3***	-0.7	7.7	0.6***	(-25.1***)	-7.7***
Higher half		-3.3	-9.1***	-3.2	16.5	-2.3***	(15.9***)	13.7***
7. Real effective exchange rate <u>7/</u> (Median change = 3.8)								
Lower half		-0.4	8.1***	-0.4**	2.0	0.4**	-17.8***	(-10.9***)
Higher half		3.4	-11.9***	-3.5**	22.2	-2.1**	8.6***	(17.0**)

1/ The sample contains 72 countries. Asterisks indicate statistically significant differences--at the 90 percent (*), 95 percent (**), or 99 percent (***) confidence level--between the pairs of half-groups (of 36 countries each) identified in the stub. A nonparametric (rank-sum) test--the Mann-Whitney U test--was used for assessing statistical significance.

2/ Measured by consumer price indices. A minus sign indicates a reduction in the rate of inflation.

3/ A minus sign indicates an increase in the current deficit, or a reduction in the current surplus, relative to the value of exports of goods and services.

4/ A minus sign indicates a reduction in the growth rate of real GDP.

5/ Calculated as the change (in percentage points) in the annual average percentage change of the ratio of domestic credit to real GDP. A minus sign indicates a shift to a less expansionary credit policy.

6/ A minus sign indicates an increase in a deficit or a reduction in a surplus.

7/ Average effective exchange rates for 1980-81 are set equal to 100. A minus sign indicates depreciation.

Table 4. Developing Countries: Cross-Classified by Economic Performance and Policy

(Changes from average for 1976-78 to average for 1979-81, in percentage points)

	Mean Change, for Half-Group Identified in Stub, in:						
	Rate of inflation <u>2/</u>	Current account balance in percent of exports of goods and services <u>3/</u>	Growth of real GDP <u>4/</u>	Rate of expansion of domestic credit per unit of real GDP <u>5/</u>	Ratio of fiscal balance to GDP <u>6/</u>	Nominal effective exchange rate <u>7/</u>	Real effective exchange rate <u>7/</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Countries classified by <u>magnitude of changes in:</u>							
1. Rate of inflation <u>2/</u> (Median change = 4.3)							
Lower half	(-4.9***)	-9.9	-1.6*	-5.1***	0.4*	-10.0	3.7
Higher half	(14.2***)	-9.4	-3.6*	11.9***	-1.2*	-6.3	6.3
2. Current account balance in percent of exports of goods and services <u>3/</u> (Median change = -7.9)							
Higher half	5.9	(8.7***)	-2.5	1.0	1.1***	-10.0	1.0*
Lower half	3.5	(-28.0***)	-2.7	5.7	-1.8***	-6.3	9.0*
3. Growth of real GDP <u>4/</u> (Median change = -2.1)							
Higher half	3.4	-6.7	(1.4***)	3.2	0.5**	-11.4	5.2**
Lower half	6.0	-12.5	(-6.6***)	3.5	-1.2**	-4.9	4.8**
4. The rate of expansion of domestic credit per unit of real GDP <u>5/</u> (Median change = 3.9)							
Lower half	1.7***	-10.0	-1.9	(-10.8***)	0.4*	-7.2	2.9
Higher half	7.7***	-9.2	-3.3	(17.5***)	-1.1*	-9.2	7.1
5. Ratio of fiscal balance to GDP <u>6/</u> (Median change = -0.5)							
Higher half	2.4	-0.1***	-2.5	0.8	(2.3***)	-11.1	8.9
Lower half	6.9	-19.2***	-2.7	6.0	(-3.0***)	-5.3	1.1
6. Nominal effective exchange rate <u>7/</u> (Median change = -3.3)							
Lower half	5.4	-13.1	-2.3	4.9	-0.8	(-22.0***)	8.4
Higher half	3.9	-6.2	-2.9	1.8	0.1	(5.7***)	1.6
7. Real effective exchange rate <u>7/</u> (Median change = 0.2)							
Lower half	6.7	-0.8***	-1.9*	1.8	0.4	-11.3	(-7.0***)
Higher half	2.7	-18.4***	-3.3*	4.9	-1.1	-5.1	(17.0***)

1/ The sample contains 72 countries. Asterisks indicate statistically significant differences--at the 90 percent (*), 95 percent (**), or 99 percent (***) confidence level--between the pairs of half-groups (of 36 countries each) identified in the stub. A nonparametric (rank-sum) test--the Mann-Whitney U test--was used for assessing statistical significance.

2/ Measured by consumer price indices. A minus sign indicates a reduction in the rate of inflation.

3/ A minus sign indicates an increase in the current deficit, or a reduction in the current surplus, relative to the value of exports of goods and services.

4/ A minus sign indicates a reduction in the growth rate of real GDP.

5/ Calculated as the change (in percentage points) in the annual average percentage change of the ratio of domestic credit to real GDP. A minus sign indicates a shift to a less expansionary credit policy.

6/ A minus sign indicates an increase in a deficit or a reduction in a surplus.

7/ Average effective exchange rates for 1976-78 are set equal to 100. A minus sign indicates depreciation.

Table 5. Developing Countries: Cross-Classified by Economic Performance and Policy

(Changes from average for 1978-80 to average for 1981-83, in percentage points)

	Mean Change, for Half-Group Identified in Stub, in:						
	Rate of inflation <u>2/</u>	Current account balance in percent of exports of goods and services <u>3/</u>	Growth of real GDP <u>4/</u>	Rate of expansion of domestic credit per unit of real GDP <u>5/</u>	Ratio of fiscal balance to GDP <u>6/</u>	Nominal effective exchange rate <u>7/</u>	Real effective exchange rate <u>7/</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Countries classified by magnitude of changes in:							
1. Rate of inflation <u>2/</u> (Median change = -0.2)							
Lower half	(-6.7***)	-9.9	-2.3	-0.5	-1.0	6.8***	6.9
Higher half	(13.4***)	-7.5	-2.5	19.5	-1.7	-13.7***	8.3
2. Current account balance in percent of exports of goods and services <u>3/</u> (Median change = -5.1)							
Higher half	5.6	(6.4***)	-3.0	9.7	0.2***	-4.7	2.3**
Lower half	1.2	(-23.8***)	-1.8	9.3	-3.0***	-2.2	12.9**
3. Growth of real GDP <u>4/</u> (Median change = -2.6)							
Higher half	-1.9*	-10.8	(1.2***)	5.2***	-1.4	-3.8	6.2
Lower half	8.7*	-6.6	(-6.1***)	13.7***	-1.3	-3.1	9.0
4. The rate of expansion of domestic credit per unit of real GDP <u>5/</u> (Median change = 1.6)							
Lower half	-2.2**	-6.3*	-0.8***	(-10.5***)	-1.0	2.1	9.7
Higher half	8.9**	-11.1*	-4.0***	(29.4***)	-1.7	-9.0	5.4
5. Ratio of fiscal balance to GDP <u>6/</u> (Median change = -0.7)							
Higher half	4.4	-0.9***	-2.1	7.8	(1.7***)	-10.5**	3.6*
Lower half	2.3	-16.5***	-2.8	11.2	(-4.5***)	3.7**	11.6
6. Nominal effective exchange rate <u>7/</u> (Median change = -0.6)							
Lower half	7.8*	-5.7*	-2.2	8.8	-0.9*	(-25.1***)	-0.8***
Higher half	-1.1*	-11.7*	-2.7	10.2	-1.8*	(18.2***)	15.9***
7. Real effective exchange rate <u>7/</u> (Median change = 9.2)							
Lower half	2.7	-1.6***	-2.4	4.7	-0.5*	-13.5***	(-8.0***)
Higher half	4.0	-15.8***	-2.5	14.3	-2.2*	6.6***	(23.2***)

1/ The sample contains 72 countries. Asterisks indicate statistically significant differences—at the 90 percent (*), 95 percent (**), or 99 percent (***) confidence level—between the pairs of half-groups (of 36 countries each) identified in the stub. A nonparametric (rank-sum) test—the Mann-Whitney U test—was used for assessing statistical significance.

2/ Measured by consumer price indices. A minus sign indicates a reduction in the rate of inflation.

3/ A minus sign indicates an increase in the current deficit, or a reduction in the current surplus, relative to the value of exports of goods and services.

4/ A minus sign indicates a reduction in the growth rate of real GDP.

5/ Calculated as the change (in percentage points) in the annual average percentage change of the ratio of domestic credit to real GDP. A minus sign indicates a shift to a less expansionary credit policy.

6/ A minus sign indicates an increase in a deficit or a reduction in a surplus.

7/ Average effective exchange rates for 1978-80 are set equal to 100. A minus sign indicates depreciation.

Table 6. Developing Countries: Cross-Classified by Economic Performance and Policy

(Changes from average for 1976-79 to average for 1980-83, in percentage points)

Mean Change, for Half-Group Identified in Stub, in:							
	Rate of inflation <u>2/</u>	Current account balance in percent of exports of goods and services <u>3/</u>	Growth of real GDP <u>4/</u>	Rate of expansion of domestic credit per unit of real GDP <u>5/</u>	Ratio of fiscal balance to GDP <u>6/</u>	Nominal effective exchange rate <u>7/</u>	Real effective exchange rate <u>7/</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Countries classified by <u>magnitude of changes in:</u>							
1. Rate of inflation <u>2/</u> (Median change = 2.6)							
Lower half	(-4.8***)	-12.0	-3.5	4.8	0.0*	-1.1	5.9
Higher half	(15.7***)	-12.8	-3.1	11.9	-2.4*	-12.3	8.2
2. Current account balance in percent of exports of goods and services <u>3/</u> (Median change = -7.4)							
Higher half	10.0	(5.7***)	-3.4	9.5	0.5***	-10.8	-1.6***
Lower half	0.9	(-30.5***)	-3.3	7.2	-2.8***	-2.5	15.7***
3. Growth of real GDP <u>4/</u> (Median change = -3.2)							
Higher half	5.8	-12.7	(0.5***)	7.7	-1.5	-10.3	5.5
Lower half	5.1	-12.2	(-7.2***)	9.0	-0.8	-3.0	8.6
4. The rate of expansion of domestic credit per unit of real GDP <u>5/</u> (Median change = 2.6)							
Lower half	3.2	-12.9	-2.1*	(-8.2***)	-0.9	-5.6	9.4
Higher half	7.7	-11.9	-4.5*	(24.9***)	-1.4	-7.7	4.6
5. Ratio of fiscal balance to GDP <u>6/</u> (Median change = -1.0)							
Higher half	8.5	-2.9***	-3.8	8.7	(1.7***)	-11.0	4.4*
Lower half	2.4	-22.0***	-2.9	8.0	(-4.0***)	-2.3	9.7*
6. Nominal effective exchange rate <u>7/</u> (Median change = -3.2)							
Lower half	8.8	-11.8	-2.8	7.7	-1.4	(-28.2***)	6.3
Higher half	2.1	-13.1	-3.9	9.0	-1.0	(14.8***)	7.8
7. Real effective exchange rate <u>7/</u> (Median change = 4.6)							
Lower half	5.4	-6.1*	-2.9	3.1	-0.4	-13.6*	(-6.6***)
Higher half	5.5	-18.8*	-3.8	13.6	-1.9	0.2*	(20.6***)

1/ The sample contains 72 countries. Asterisks indicate statistically significant differences—at the 90 percent (*), 95 percent (**), or 99 percent (***) confidence level—between the pairs of half-groups (of 36 countries each) identified in the stub. A nonparametric (rank-sum) test—the Mann-Whitney U test—was used for assessing statistical significance.

2/ Measured by consumer price indices. A minus sign indicates a reduction in the rate of inflation.

3/ A minus sign indicates an increase in the current deficit, or a reduction in the current surplus, relative to the value of exports of goods and services.

4/ A minus sign indicates a reduction in the growth rate of real GDP.

5/ Calculated as the change (in percentage points) in the annual average percentage change of the ratio of domestic credit to real GDP. A minus sign indicates a shift to a less expansionary credit policy.

6/ A minus sign indicates an increase in a deficit or a reduction in a surplus.

7/ Average effective exchange rates for 1976-79 are set equal to 100. A minus sign indicates depreciation.

to underline the two-way approach relating policies and targets. It is important for the purpose of this paper that the results obtained from the two ways of looking at the relations be consistent with each other. Because each of the target variables are influenced by several factors, it does not follow necessarily that, for instance, if division of countries according to DC/y show that greater increase in credit is significantly associated with greater increase in inflation rate, then division of countries according to inflation change will also show that the group with higher inflation change also showed significantly greater increase in credit expansion. Nevertheless, in order to avoid needless repetition the following discussion is organized around the target variables.

III. Inflation

An increased rate of expansion of the money stock tends to increase inflation. But the line of causation is not always from money stock expansion to inflation. Sometimes inflationary pressures come from structural and supply factors operating in the domestic economy or emanating from abroad, ^{1/} and, in order to forestall any adverse effects on output and employment, the monetary authorities often ratify the ensuing price increases by policies that increase the rate of money stock expansion. Apart from the supply of money, also important in influencing the rate of inflation are the factors affecting the real demand for money. Among such factors, exogenous real output growth, interest rates on financial assets, and the anticipated rate of inflation, have been found to be important. In developing countries, the pace of monetization and of banking development have also been found significant in explaining money demand (see e.g. Aghevli (1980), Chandavarkar (1977), Goldsmith (1969)).

Fiscal balance

The money stock can be defined as the sum of net foreign assets (NFA) and domestic credit (DC) of the banking system. The latter (DC) is, in turn, the sum of credit to government and credit to the private sector. Since in developing countries the portion of the fiscal deficit financed from domestic sources tends to be largely credit from the banking system, changes in the fiscal balance tend to affect DC. This author believes that this is the main mechanism through which increases in the fiscal balance (FB/Y) exert their influence on the rate of domestic inflation. But inflation itself can be a factor determining the fiscal balance owing to collection lags in tax administration, inelasticity of the tax system, and discretionary changes in expenditure and revenue policies (see e.g. Heller (1980) and Tanzi (1978)).

^{1/} See for example Aghevli (1981), Cline (1981), O.E.G. Johnson (1984) and Saini (1982).

Domestic credit

Domestic credit expansion, whether to the government or to the private sector, tends to engender an increase in the demand for domestic commodities, unless such expansion is neutralized by sufficient increases in the demand for financial assets or for money. Therefore, exogenous increases in domestic credit that are rapid in relation to real output and interest rate increases will tend to generate excess demand for commodities and will be inflationary. In this paper, this effect is being investigated by looking at the relationship between DC/y and inflation. But it should be noted that inflationary pressures from other sources can cause DC/y to increase, to the extent that the banking system finances (through credit to government or to the private sector) exogenous increases in supply prices due, for example, to wage increases, exchange rate changes and rises in the prices of imported commodities.

Exchange rate

It is well known that currency depreciation (involving the nominal exchange rate) tends to raise the domestic price level by raising the domestic price of imported commodities. Conversely, monetary authorities often depreciate their currencies as a way of compensating for rapid inflation rates relative to the inflation rates of trading partner countries. In light of floating exchange rates, the paper uses the nominal effective exchange rate rather than simply the exchange rate measured in terms of one numeraire currency. The nominal effective exchange rate is measured as an import-weighted index of average annual exchange rates of trading partner currencies in units of the domestic currency.

Empirical results

Tables 1 - 6 show that for inflation the most striking relation is between change in the rate of inflation and change in the rate of expansion of domestic credit per unit of real GDP. Relative contraction in the rate of expansion of domestic credit is associated with relative reduction in the rate of inflation. But there was one paradoxical situation; for the period 1976-77 to 1978-79, when the division of the sample was made according to the DC/y criterion, the relation was significantly negative, indicating that relative contraction of domestic credit expansion was associated with relative increase in the inflation rate (see Table 7, where the results for inflation are summarized). This result suggests that other exogenous factors played a substantial role in explaining relative changes in inflation between 1976-77 and 1978-79. In most of the other subcases, the difference in credit expansion between the inflation-declining (lower half) group and the other (higher half) group was rather significant in relation to the underlying variability of domestic credit expansion of the countries.

Table 7. Developing Countries: Inflation and Financial Policies 1976-83

Period	Assignment of Countries According to			
	Policy Criterion		Inflation Target	
	Sign of relation ^{1/}	Significance level (In percent) ^{1/}	Sign of relation	Significance level (In percent) ^{1/}
<u>(a) Policy: DC/y</u>				
1976-77 to 1978-79	Negative	90	Positive	90
1978-79 to 1980-81	Positive	95	Positive	90
1980-81 to 1982-83	Positive	95	Positive	99
1976-78 to 1979-81	Positive	99	Positive	99
1978-80 to 1981-83	Positive	95	Positive	--
1976-79 to 1980-83	Positive	--	Positive	--
<u>(b) Policy: FB/Y</u>				
1976-77 to 1978-79	Negative	--	Neutral	--
1978-79 to 1980-81	Negative	--	Positive	--
1980-81 to 1982-83	Negative	--	Negative	--
1976-78 to 1979-81	Negative	--	Negative	90
1978-80 to 1981-83	Positive	--	Negative	--
1976-79 to 1980-83	Positive	--	Negative	90
<u>(c) Policy: NER</u>				
1976-77 to 1978-79	Positive	--	Positive	--
1978-79 to 1980-81	Negative	--	Negative	--
1980-81 to 1982-83	Negative	--	Negative	--
1976-78 to 1979-81	Negative	--	Positive	--
1978-80 to 1981-83	Negative	90	Negative	99
1976-79 to 1980-83	Negative	--	Negative	--

Source: Tables 1-6.

^{1/} Two dashes (--) indicate that the level of significance is less than 90 percent.

There were also two cases for which the positive relation between relative changes in domestic credit expansion and in inflation was not unambiguously significant (viz., change from 1978-80 to 1981-83 and from 1976-79 to 1980-83). In the first case, i.e., 1978-80 to 1981-83, looking at things from the policy side, there was a significant positive relation between changes in the rate of credit expansion and changes in inflation, but looking at things from the target side the positive relation was not significant. For the second case--1976-79 to 1980-83--the sign of the relation between relative changes in inflation and relative changes in domestic credit was also positive but there was no statistical significance at even the 90 percent level. What this implies is that other domestic exogenous forces--including monetization, technological changes, and political developments--together with the differential impact of external exogenous forces, were very important in explaining relative differences in changes in inflation between the two four-year spans.

In contrast to the prevalence of significant relationships between inflation and domestic credit (relative to real GDP), the almost complete absence of significant relationships between fiscal balance and inflation is noteworthy. This finding is consistent with the view that changes in fiscal balance can be accommodated by domestic credit changes or changes in other factors, e.g., external financing, and that fiscal balance exerts its influence on inflation in developing countries mainly through domestic credit. In general, though, Tables 1 through 6 do reveal a negative relationship between the two variables, inflation and fiscal balance, whether we divide the sample according to the policy (FB/Y) or according to the target (inflation).

The absence of significant relationships is also noteworthy in the case of inflation and the nominal effective exchange rate (NER). The negative relationship between nominal exchange rate appreciation and the inflation rate was significant at the 90 percent and 99 percent level only for the period 1978-80 to 1981-83, depending on whether the division of the sample is done from the viewpoint of the policy or the target respectively. This probably reflects greater use of the exchange rate as a policy instrument during the 1981-83 period; the mean difference for the nominal exchange rate change between the relative depreciating and relative appreciating countries was 43.3 percentage points (see Table 5, row 6, column 6)--larger than for any of the other cases studied.

The seemingly weak association across countries between the nominal exchange rate change and inflation could be due inter alia to the nature of stabilization programs, under which relative nominal depreciation may be associated with relative credit contraction and fiscal improvement. That is, when countries seek to improve their internal and external balance, their policies may include credit restraint, fiscal improvement, and nominal exchange rate depreciation. The effect of the first two policies would be to reduce inflation.

IV. Current Account

In this section it will be first argued that, for the typical (non-oil) developing country, it is reasonably certain that the fiscal balance in relation to GDP (FB/Y ratio) is likely to be positively associated with the current account ratio; that there is less certainty that depreciation of the real effective exchange rate will improve the current account, although the expectation is that it will generally do so; and that the relation between domestic credit and the current account is particularly uncertain. The evidence in Tables 1-6 will then be discussed and shown to be in conformity with expectation.

Fiscal balance

The external current account can be expressed, it is well known, as the sum of the excess of government saving (Sg) over government investment (Ig) and private saving (Sp) of nationals over private domestic investment (Ip). If X denotes exports of goods and services, and M, imports, then, equilibrium,

$$\begin{aligned}\frac{X-M}{X} &= \left[\frac{Sg - Ig}{Y} + \frac{Sp - Ip}{Y} \right] \cdot \frac{Y}{X} \\ &= \left[\frac{FB}{Y} + \frac{Sp - Ip}{Y} \right] \cdot \frac{Y}{X}\end{aligned}\tag{1}$$

where Y is, strictly speaking, gross national product (GNP) but with no loss in economic content can be taken as GDP here. This convenience is required in view of the greater ease of obtaining GDP data in developing countries than in getting GNP data.

Equation (1) shows that, given the ratio of exports to GDP, the current account ratio varies positively with the fiscal balance and with the excess of domestic private saving over domestic private investment (relative to GDP). Let G_b be government borrowing defined as the sum of government borrowing from the domestic banking system (G_{bb}), from the nonbank domestic sector (G_{bn}) and from foreigners (G_{bf}). Then, assuming no net arrears accumulation by the government,

$$\frac{FB}{Y} = -\frac{(G_{bh} + G_{bn} + G_{bf})}{Y}\tag{2}$$

Both Sp/Y and Ip/Y are expected to be affected by FB/Y . An increase in the FB/Y ratio may reflect a decline in the G_{bn}/Y ratio. With the government reducing its borrowing from the domestic nonbank public (in relation to GDP), domestic interest rates may decline and private saving may drop relative to GDP (i.e., Sp/Y may drop). In that case the improvement in the fiscal balance relative to GDP, which helps the current account ratio directly, causes the latter ratio to deteriorate indirectly through the private saving effect.

But the indirect fiscal effect through the saving ratio should not be exaggerated. Nonbank borrowing is rather small relative to GDP in developing countries (see Goode 1984, pp. 195-203), and with a general dependence of such borrowing on captive lenders (public bodies, insurance companies, and pension and providence funds), together with below-market rates for such funds, it is not likely that the general level of interest rates is much affected by variations in such lending. Thus, mainly because of the above factors, changes in the FB/Y ratio are not likely to be due to variations in G_{bn}/Y to any great degree.

Indirect effects of fiscal improvement on the current account are not likely to be limited to those working through the saving function. Much more significant indirect effects on the current account are likely to operate via the private investment ratio to GDP (i.e., Ip/Y). There are three basic channels here. First is the well-known crowding-out effect (see, e.g., Atkinson and Stiglitz 1980). To the extent that an improvement in the fiscal balance leads to reduced domestic borrowing from both banks and nonbanks, under normal circumstances the expectation is that the supply of funds to private investors will increase if public bonds are substitutes for private capital in personal portfolios, facilitating increased private investment in relation to GDP. The second channel is the Ricardian effect (see, e.g., Atkinson and Stiglitz, op cit.) If the increase in the fiscal balance/GDP ratio is achieved mainly by expenditure reductions or nontax and nondebt-creating revenue increases, then the future tax burden anticipated by investors may decline, leading to a rise in the marginal efficiency of investment schedules, and increased equilibrium investment at any given real interest rate. The crowding-out and the Ricardian effects, therefore, can both have the consequence of raising the Ip/Y ratio and worsening the current account ratio when FB/Y increases.

But there is a third effect--the real interest rate effect--which, at least initially, could dampen the private investment-inducing effects of fiscal improvement. This could come into play if the fiscal change reduces inflation which, to the extent it was unanticipated, then increases the real interest rate. But it is conjectured here that this effect is not likely to be as important as the sum of the crowding out and Ricardian effects.

The direct impact of improvements in the fiscal balance is, in brief, offset only somewhat by a countervailing increase in the private investment ratio and decrease in the private saving ratio. The current account is expected to improve with the fiscal improvement.

Both the current account and the fiscal balance can improve because of certain other factors. Of particular interest here are three such factors that affect the fiscal balance directly--external terms of trade, real demand for a country's exports due to economic growth abroad, and direct restrictions of private imports. These three factors influence the fiscal balance to the extent that a country relies on taxes on international trade as a source of budgetary revenue, or to the extent that changes in exports influence (real) GDP growth. The first two of the three factors will, however, reinforce the positive relation between the fiscal balance and the current account balance. But the third factor--contraction of imports through restrictions--will tend to diminish government revenue from international trade, and may reduce real output and hence income tax revenue; in that case, the fiscal balance may worsen at the same time that the current account is improving.

Domestic credit

The ratio of domestic credit to real GDP is hypothesized to influence the current account ratio through private saving and investment as well as through the fiscal balance. An increase in the expansion of domestic credit in relation to real GDP, which finances increased private consumption and/or increased private investment (relative to GDP), worsens the current account. Moreover, an increase in the rate of expansion of domestic credit in relation to output often reflects financing of the fiscal deficit, with attendant adverse consequences for the current account as discussed before.

In many developing countries, however, account must be taken of the fact that, due to additional monetization of the economy, the ratio of money demand to income tends to be increasing. Satisfaction of this demand could mean improved foreign reserves of the banking system, 1/ and/or lower domestic prices (and inflation). Alternatively, the increased money demand could be accommodated by increased domestic credit in relation to real output; indeed, where prices and rentals tend to be relatively sticky in a downward direction, this may be a more rational approach, which thereby ensures that adverse shock effects on real output do not result from the monetization process. The monetization process itself may be proceeding too slowly to be of great importance for monetary

1/ This, of course, follows from the monetary approach to the balance of payments (see e.g., H.G. Johnson 1973 and Mundell 1971).

policy in any given year. But the point of relevance is that some expansion in the ratio of domestic credit to real output would be consistent, in this situation, with no worsening or even an improvement in the current account ratio.

Domestic credit expansion often occurs to finance additional exports that also increase real GDP. This is particularly the case in countries where agriculture is important in exports. When a rapid expansion of domestic credit relative to real output reflects (or permits) an expansion of exports relative to GDP, domestic credit expansion may actually be associated with an improvement in the current account, especially when the marginal propensity to save of those earning from exports ("exporters" for short) is greater than the average propensity to save. In the typical developing country that exports primary products, this is particularly likely to occur. In addition, the lower the income level of such a country, the more likely the saving/income ratio would be positively correlated with the export/GDP ratio, since income earners of the export sector are likely to dominate the highest income brackets of the population. ^{1/}

Exchange rate

Real effective exchange rate (RER) changes can occur through nominal effective exchange rate movements and through monetary and fiscal measures that alter the rate of domestic inflation relative to foreign inflation. In general, a policy designed to alter the RER will involve some mixture of both approaches, particularly when the relative price consequences of real effective exchange rate changes are required to take effect quickly. The particular policy mix will be chosen with a view to avoiding adverse short-run effects of the adjustment process on real output.

A depreciation of the nominal effective exchange rate is generally expected to lead to an increase in the domestic price level (P), other things being equal. In domestic currency terms, the percentage increase in the value of some foreign (numeraire) currency is expected to be greater than the percentage increase in domestic prices; in short, the price level of traded goods (P_T) is expected to rise in relation to the price level of nontraded goods (P_{NT}). The less the influence of the country on the foreign currency prices of its imports and exports, the more certain the increase in P and in P_T/P_{NT} .

Depreciation of the real effective exchange rate (RER), consequent upon a decline in nominal effective exchange rates and/or a rise in the prices of traded goods (or simply foreign prices) relative to the prices

^{1/} For a review of the early work on the relationship between exports and savings in developing countries see Mikesell and Zinser (1973).

of nontraded goods (or simply domestic prices), favorably affects the current account to the extent that it raises the FB/Y and S_p/Y ratios and lowers the I_p/Y ratio. When the RER is being successfully depreciated, it is expected that real absorption (i.e., real consumption plus real investment) will tend to decline with favorable effects on the current account balance. But to the extent that the RER depreciation constitutes desired (that is, efficient) adjustment, it may boost confidence in the economy and encourage net capital inflow; it may also induce increased capacity utilization and improved efficiency in the use of productive resources. Whereas the capacity utilization and resource efficiency effects tend to improve the current account by augmenting aggregate output and the supply of exports and import substitutes, the capital inflow effect may actually tend to worsen the current account balance. The interplay of these last three effects and the absorption effect evidently creates some uncertainty as to the overall effect of RER depreciation on the current account, both in terms of direction and timing. But unless the capital inflow effect is very substantial the current account balance should improve with RER depreciation; the longer the time period in question, the more likely is this outcome. 1/.

If the current account improves autonomously--e.g., through improved terms of trade or increased foreign real demand for exports--then the real effective exchange rate may actually appreciate because of domestic inflationary pressure consequent upon increased domestic economic activity. In that case, the current account improvement will be associated with real effective exchange appreciation.

Empirical findings

The upshot of the above discussion is that, in the typical developing country, it is reasonably certain that the fiscal balance in relation to GDP (FB/Y ratio) will be positively associated with the current account ratio and that improvement in the FB/Y ratio will, over a period of, say, one year, tend to improve the current account. There is less likelihood, although still a general presumption, of a negative relation between changes in the real effective exchange rate and the current account; the likelihood of such a relationship increases--for a period of, say, one to two years--the greater the positive effect of a depreciation on exports and the smaller the positive effect on net capital inflow. That the effect of increased domestic credit relative to real output on the current account will be negative is also uncertain. It will tend to be negative to the extent that it finances budget deficits, private investment and private consumption. But it will be positive or neutral to the

1/ For a discussion of some of these issues, see almost any textbook on exchange rate economics. See, for example, Krueger (1983).

extent that it finances increased monetization and increased exports relative to GDP. 1/

Tables 1-6 show a clear positive association between relative improvement in the fiscal balance (FB/Y ratio) and relative improvement in the current account ratio. For all six periods of comparison the relationship is significant; indeed, only for the change from 1978/79 to 1980/81 is the significance less than the 99 percent level. The results for the current account are summarized in Table 8 using a similar format as for Table 7. The tables also show a clear significant negative relation in all periods between changes in the real effective exchange rate and changes in the current account ratio. The significance was shown for all the periods of comparison; but for the change from 1978/79 to 1980/81 the significance is not so clear-cut, since it is less than at the 90 percent level when the division of the sample is based on the policy criterion, i.e., real effective exchange rate.

The relationship between the change in domestic credit expansion and the current account is more problematic. Of the 12 subcases, only five were significant (at the 90 percent and 95 percent levels). All the significant cases show a negative relation, indicating that relative increases in the rate of credit expansion were associated with relative deterioration in the current account ratio. The data presented seem, therefore, to support the tentative conclusion that the relationship between changes in DC/y and the current account ratio was, during 1976-83, generally negative, although in many instances there was no significant relationship.

The data presented would seem to indicate that the relative current account changes in 1980-81 compared with 1978-79 (see Table 2) were especially influenced by exogenous factors not included in this paper and by their differential impact on different countries, more so than for other period-to-period changes (shown in the Tables 1, 3-6). First of all, the positive relation between changes in FB/Y and changes in the current account ratio is weakest for the change from 1978-79 to 1980-81;

1/ The available empirical evidence is consistent with the position that an increase in FB/Y and depreciation of RER will, ceteris paribus, tend to improve the current account balance (in relation to exports of goods and services) for the typical (non-oil) developing country as far as annual changes are concerned (see, e.g., Kelly (1982), and Khan and Knight(1983)). Regression analysis with pooled cross-section time-series data by this author did not find significance (at even the 0.10 level) between annual changes in the rate of expansion of the DC/y ratio and the current account ratio of the non-oil LDCs for which data were available during the years 1974-80, once changes in RER and FB/Y were taken into account.

in all the other cases (Tables 1, 3-6) the significance is at the 99 percent confidence level, while in the case under discussion (Table 2) the significance is at the 90 percent confidence level.

Second, the fact of significance between relative depreciation of the real effective exchange rate and the relative improvement of the current account remains true for all the other cases, i.e., except for the change from 1978-79 to 1980-81, whether the criterion of assignment of countries to "higher" and "lower" categories is the current account or the real effective exchange rate. As can be seen from Table 2, when the criterion of assignment of countries is the current account, the real effective exchange rate of the higher half (i.e., the superior current account performers) appreciated by significantly less (2.9 percentage points) than the appreciation (10.7 percentage points) of the lower half; the level of significance of this difference was at the 95 percent confidence level. But when the criterion of assignment of countries is the real effective exchange rate, even though the current account deterioration of the relatively depreciating group (the lower half) was smaller (-3.1 percentage points change) than that (-11.3 percentage points change) of the relatively appreciating group (the higher half), this difference is not statistically significant at even the 90 percent confidence level.

In contrast to the relative current account performance in 1980-81 compared to 1978-79, which seems to have been especially influenced by other exogenous forces, the relative current account performance in 1978-79 compared to 1976-77 (Table 1) and that in 1982-83 compared to 1980-81 (Table 3) seem to have been especially affected by domestic financial policies: for these two cases there is a clear significant negative relation between relative changes in the rate of expansion of domestic credit per unit of real GDP and relative changes in the current account ratio, while the relation is less clear for the other periods.

V. Growth

In this section, it will be argued that there are so many factors working in different directions, that for both the fiscal balance and domestic credit expansion it is not possible to specify a priori how relative growth performance will be correlated with relative application of instruments. It will also be argued that in the case of the exchange rate, there is some merit in expecting that relative depreciation of the real exchange rate will be positively correlated with better growth performance. The empirical findings will then be discussed; in general, the results for the fiscal balance and the exchange rate are as expected, while those for domestic credit are less ambiguous than expected a priori.

Table 8. Developing Countries: The Current Account and Financial Policies, 1976-83

Period	Assignment of Countries According to			
	Policy Criterion		Current Account Target	
	Sign of relation	Significance level (In percent) 1/	Sign of relation	Significance level (In percent) 1/
<u>(a) Policy: DC/y</u>				
1976-77 to 1978-79	Negative	95	Negative	95
1978-79 to 1980-81	Negative	--	Negative	--
1980-81 to 1982-83	Negative	90	Negative	95
1976-78 to 1979-81	Positive	--	Negative	--
1978-80 to 1981-83	Negative	90	Positive	--
1976-79 to 1980-83	Positive	--	Positive	--
<u>(b) Policy: FB/Y</u>				
1976-77 to 1978-79	Positive	99	Positive	99
1978-79 to 1980-81	Positive	90	Positive	90
1980-81 to 1982-83	Positive	99	Positive	99
1976-78 to 1979-81	Positive	99	Positive	99
1978-80 to 1981-83	Positive	99	Positive	99
1976-79 to 1980-83	Positive	99	Positive	99
<u>(c) Policy: RER</u>				
1976-77 to 1978-79	Negative	90	Negative	90
1978-79 to 1980-81	Negative	--	Negative	95
1980-81 to 1982-83	Negative	99	Negative	99
1976-78 to 1979-81	Negative	99	Negative	90
1978-80 to 1981-83	Negative	99	Negative	95
1976-79 to 1980-83	Negative	90	Negative	99

Source: Tables 1-6.

1/ Two dashes (--) indicate that the level of significance is less than 90 percent.

On the basis of both theory and evidence [see e.g., Thirlwall, Chapter 2], the following can be said about growth in developing countries. The rate of growth (\hat{y}) can, first of all, be considered as the sum of growth in output per worker, and growth of the labor force (\hat{N}). Output per worker will tend to vary positively with capital per worker (K/N), the quality of the labor force (Q_N), improvements in technology, organization and resource allocation (T), as well as capacity utilization rate or, more broadly, the degree to which available resources are exploited (U). In brief,

$$\hat{y} = \hat{y} (K/N, Q_N, T, U, \hat{N})$$

where a hat over a variable indicates a rate of change. The quality of labor force, Q_N , of course depends on health, education, and nutrition. An important element of the variable T for developing countries has been resource transfers from agriculture to industry, although their importance in empirical investigations has not been as great as expected [Thirlwall p. 61].

Increasing the ratio of investment (I) to GDP is an important way in which K/N is raised. As far as growth is concerned it is the author's view that the major impact of the financial variables being analyzed here will be through investment (both directly, and indirectly through domestic saving and net capital inflows from abroad). It is not, of course, ruled out that changes in fiscal balance (FB/Y), domestic credit expansion (DC/y) and the real effective exchange rate (RER) do have effects on growth working through factors other than capital and investment; the hypothesis is only that, in general, these effects would be swamped by the effects on growth operating via I/Y .

Fiscal balance

Turning now to the effect of the policy variables on investment, the issue with regard to the fiscal balance is whether the FB/Y ratio is positively or negatively correlated with the investment ratio (I/Y). In particular, does an improvement in the fiscal balance in relation to GDP tend to raise the investment ratio? The answer would seem to depend, inter alia, upon whether the fiscal improvement has been achieved primarily by raising government revenue (G_R) or by reducing government expenditure (G_E).

Where government revenue in relation to GDP (G_R/Y) has been raised, the effect on the I/Y ratio would be positive if government capital expenditure (G_{KF}) relative to government expenditure (i.e., the G_{KF}/G_E ratio) is greater than the ratio of private investment to private income (or, in general, if the G_{KF}/G_E ratio is greater than the average I/Y ratio

for the whole economy). If, on the other hand, the fiscal balance has been improved mainly by reducing government expenditure in relation to GDP, then the I/Y ratio tends to increase if the G_KF/G_E ratio is lower than the average I/Y ratio for the economy as a whole. Thus both the relation between changes in FB/Y and changes in G_R/Y and G_E/Y and the relation between G_KF/G_E and I/Y, are important in the determination of the relation between changes in FB/Y and changes in I/Y. As such, it is not possible to draw any clear conclusion between real GDP growth and the fiscal balance operating directly through the investment ratio.

It may be noted that if what has come to be called the "Please effect" (see Please 1967) operates, i.e., if when taxes are raised, government consumption increases more than private consumption is lowered, then the I/Y ratio may well fall, with an increase in FB/Y achieved through increased G_R/Y . But other investigators have found that aggregate domestic savings relative to GDP have increased with increasing taxes relative to GDP (see the discussion in Brothwell 1977). It may also be noted that, on the side of expenditure, since capital expenditure of the government tends to be more easily cut when expenditure is reduced--generally because the social and human implications are less painful in the short run--an increase in FB/Y achieved through lowering G_E/Y could easily ensue in a lower I/Y.

The change in the fiscal deficit itself may influence saving and investment in the private sector, such that the private sector investment ratio increases with an improvement in the fiscal balance and vice versa for a deterioration in the fiscal balance (see the discussion in Section IV above). For instance, the improvement in the fiscal situation through reduction in government expenditure may improve confidence in the economy, particularly as regards the prospects for inflation and exchange rate stability as well as for the future level of taxation, inducing a marginal increase in the saving and investment ratios in the private sector. These effects would temper any tendency for reduction in government expenditure/GDP ratio to induce a decline in the aggregate I/Y ratio as a result of a relatively high G_KF/G_E ratio or because government capital expenditure is cut relatively more than current expenditure.

It has so far been implicitly assumed that both the government and the private sector investments have the same impact on growth within any given period. This may not be so, for reasons including, in particular, differences in the efficiency and in the gestation periods of the two "types" of investment. It may be the case that government investment is less efficient in the sense of having a lower discounted rate of return, including external economies, than private investment. It is, also, often the case that government investment has a much longer gestation period than private investment. Thus the marginal growth effect of raising the FB/Y ratio may be positive, at least in the short run, on account of improved efficiency and reduced gestation period of the aggregate investment, when investment is reallocated from government to the private sector.

The upshot is that the relation between improvement in the fiscal situation and economic growth is extremely complex. The relation would tend to be positive where (1) government capital formation is not adversely affected, (2) private investment is favorably affected, (3) a distribution of the same level of aggregate investment from the government sector to the private sector, as a result of the fiscal improvement, increases the efficiency of total investment and shortens the average gestation period of investment toward the unit period of measurement of economic growth. In any event, there is no logical (a priori) basis to expect that, in general, changes in fiscal balances relative to GDP will be related to economic growth in a particular way, either within or between countries, during any particular time period.

Nevertheless, when the GDP growth rate increases for reasons unrelated to financial policies--e.g., external terms of trade improvement, application of new technology in a major export industry, the coming into operation of a plant exploiting a major resource find--the effect on the fiscal balance is expected to be positive. Government revenue, in such a situation, will generally increase while certain social expenditures may be deemed not as necessary as before. Conversely, when the growth rate declines for reasons unrelated to financial policies the fiscal balance will tend to be adversely affected.

Domestic credit

The relation between expansion of domestic credit in relation to real GDP (DC/y) and (real GDP) growth is also fairly complex. The shorter the period under consideration and the greater the available unused capacity at current prices, the more likely it is that an absolute decrease in the ratio may be adverse to growth and an absolute increase favorable to growth. But under normal circumstances, with monetization of the economy occurring and prices rather flexible upward and far less so downward, the relevant policy choice is the change in the rate of increase of DC/y and not simply a change in the absolute level of the ratio itself. It is in this sense that credit expansion is being used in this paper.

Augmenting the rate of increase of DC/y (i.e., increasing the rate of credit expansion) will stimulate growth to the extent that the increase raises the investment ratio 1/ while inflation is not seriously aggravated. But the expectation is that as the rate of credit expansion increases, even if the additional credit is immediately directed toward investment,

1/ The positive relation between investment and credit expansion, the shorter the run, due to the effect of credit expansion on the cost of working capital has been an important reason for arguing against "heavy" reliance on "credit crunch" to tackle inflation and to redress current account imbalances (see e.g., Taylor 1981 and van Wijnbergen 1983).

once the inflationary impact of the credit expansion begins to be serious, it will tend to adversely affect the level of real investment that is in fact made. Moreover, investment itself begins to decline in efficiency. ^{1/} In addition, rapid credit expansion, by increasing uncertainty about the future course of inflation and the exchange rate, can discourage net capital inflow.

The conclusion is that, at least for periods which are not too short, say a year or longer, the greater the increase in the rate of expansion of domestic credit (per unit of real GDP), the greater the probability that declining efficiency of investment, declining capital inflows and declining level of investment per unit of GDP will induce a negative change in the growth rate. Apart from this general conclusion, it is obvious that if the growth rate increases autonomously, for reasons unrelated to domestic credit expansion, it would exert a downward effect on the rate of increase of DC/y . The obverse would be the case for autonomous decreases in the growth rate.

Exchange rate

If the positive impact on net capital inflow is not very significant and timely, exchange rate depreciation can have contractionary effects on output (see, e.g., Diaz-Alejandro 1963, and Krugman and Taylor 1978), particularly in the very short to short run (say, three months to one year). The factors contributing to such an outcome are (a) distributional effects (b) income effects and (c) the real balance effect of depreciation, aggravated by (d) possible low elasticity of substitution in production.

Distributional effects involve shifts of income to those (say profit earners) with relatively high marginal propensity to save (MPS) from those (say, workers) with a lower MPS, with an attendant reduction in aggregate demand. Income effects supposedly arise mainly because exchange rate depreciation in developing countries usually occur where there is a current account deficit; in that case, the direct real income reducing effect of the import price increase is greater than the positive income effect of the export price increase. The real balance effect, of course, arises from the tendency of currency depreciation, by itself, to raise the general price level, a process akin to a tax on real money balances. Finally, where the elasticity of substitution in production is low, the higher price of imported raw materials and capital goods could cause production levels to drop.

^{1/} For a discussion of the relevant issues see, for example, O.E.G. Johnson (1984) and references cited in that paper.

In the short to medium run (say one to two years), depreciation of the real effective exchange rate is expected to influence favorably real investment and growth the greater the initial excess capacity, or rather the smaller the marginal cost from increasing capacity utilization, and the more price elastic the demand for the country's exportables. In general, real effective exchange rate depreciation stimulates output directly through encouraging exports and import substitutes, without a countervailing contraction in other production, and indirectly through raising the investment ratio. The rise in the investment ratio would be due, inter alia, to improved confidence and increased return from investing in domestic assets relative to holding and investing in foreign assets (returns being measured in the same currency).

When the growth rate increases for reasons unrelated to the exchange rate, it tends to exert a downward pressure on the real exchange rate because, by increasing supply, such a rise in the growth rate would tend, *ceteris paribus*, to slow down the rate of domestic inflation.

Empirical findings

From Tables 1 and 3-4, it is seen that there is some relation between the real effective exchange rate and (real GDP) growth, such that relative depreciation of the RER is associated with better growth performance. But of the 12 subcases in Tables 1-6, one shows a significant positive relation, indicating that relative appreciation was related to better growth performance. See also Table 9 for presentation of the results for growth along the same lines as Tables 7 and 8.

It is perhaps noteworthy that, from tables 1 through 6, the relative real effective exchange rate depreciation is generally associated with superior current account performance but that the change in current account performance is not significantly related to change in growth. Any positive effect of (relative) depreciation on (relative) growth due to, say, (relative) export expansion may have been often counterbalanced by the negative effect on (relative) growth of (relative) import contraction. But, as has been seen, in some instances, the relative RER depreciation was associated with better growth performance. It is possible, for instance, that relative RER depreciation helped to induce superior growth performance to the extent that it fostered not only relative expansion of export production but also, at the same time, induced a relative increase in the growth rate of nontraded goods and import substitutes. This, of course, cannot be demonstrated by the empirical data here presented.

Domestic credit expansion in relation to real output is also seen to vary inversely with growth. The major exception is the change from 1976-78 to 1979-81, when no significance is seen for the relation. It is also noteworthy that, when the division of countries is made according to

the target (growth) criterion, there is significance for three out of the six possible subcases, whereas when the division is made according to the policy (DC/y) criterion, the corresponding figure is five out of the possible six subcases.

It is noticeable that when the relative domestic credit contraction is favorably related to the current account ratio, the relative contraction of the rate of expansion of domestic credit is also favorably related to growth. But relative reduction in the DC/y expansion rate was associated with better growth performance, even in situations where relative decline in DC/y expansion was not associated with better current account performance (e.g., Table 6). The relative contraction of domestic credit expansion could, in such instances, have been also associated with relative increase in growth rate of nontraded goods. Again, the data here presented do not provide any evidence for or against this conjecture.

Relative fiscal improvement is, on the whole, shown to be associated with better growth performance; but only three subcases are significant.

VI. Concluding Remarks

In brief, the paper has been concerned, from both a theoretical and empirical point of view, with the relationship between relative performance as regards inflation, current account and growth of real GDP on the one hand and, on the other hand, the relative application of the "instruments" involving changes in domestic credit in relation to real GDP (DC/y), the fiscal balance in relation to nominal GDP (FB/Y) and the real effective exchange rate (RER). The years covered were 1976-83 and ten periods were distinguished, viz., 1976-77, 1978-79, 1980-81, 1982-83, 1976-78, 1979-81, 1978-80, 1981-83, 1976-79, and 1980-83. Changes from one period to another, immediately following and of equal length, formed the data of the empirical analysis.

It was found that in the case of inflation the important policy variable was DC/y, with relative reduction in inflation being associated with relative contraction in the change of DC/y. In the case of the current account, both relative improvement in the FB/Y ratio and relative depreciation of RER were associated with relative improvement in the current account ratio. Relative growth performance was found in one third of the instances to be significantly associated with RER, such that relative depreciation of RER was related to relative improvement in growth. The relative growth performance was also seen more often than not to be inversely related to the rate of change of DC/y.

These results were in general found consistent with standard theoretical conclusions. For instance, there are theoretical grounds to expect that domestic credit expansion tends to aggravate inflation, fiscal

Table 9. Developing Countries: Growth and Financial Policies, 1976-83

Period	Assignment of Countries According to			
	Policy Criterion		Growth Target	
	Sign of relation	Significance level (In percent) <u>1/</u>	Sign of relation	Significance level (In percent) <u>1/</u>
<u>(a) Policy: DC/y</u>				
1976-77 to 1978-79	Negative	99	Negative	90
1978-79 to 1980-81	Negative	90	Negative	--
1980-81 to 1982-83	Negative	99	Negative	99
1976-78 to 1979-81	Negative	--	Negative	--
1978-80 to 1981-83	Negative	99	Negative	99
1976-79 to 1980-83	Negative	90	Negative	--
<u>(b) Policy: FB/Y</u>				
1976-77 to 1978-79	Positive	95	Positive	90
1978-79 to 1980-81	Positive	--	Negative	--
1980-81 to 1982-83	Positive	--	Positive	--
1976-78 to 1979-81	Positive	--	Positive	95
1978-80 to 1981-83	Positive	--	Negative	--
1976-79 to 1980-83	Negative	--	Negative	--
<u>(c) Policy: RER</u>				
1976-77 to 1978-79	Negative	95	Negative	90
1978-79 to 1980-81	Positive	--	Positive	--
1980-81 to 1982-83	Negative	95	Negative	--
1976-78 to 1979-81	Negative	90	Positive	95
1978-80 to 1981-83	Negative	--	Negative	--
1976-79 to 1980-83	Negative	--	Negative	--

Source: Tables 1-6.

1/ Two dashes (--) indicate that the level of significance is less than 90 percent.

improvement tends to improve the current account, and real effective exchange rate depreciation tends to be favorable to growth and to the current account. It was also noted that in certain cases the relation between movements in the real effective exchange rate and the current account ratio may be perverse. It was further argued that an increase in the rate of expansion of domestic credit to real output would, after a point, tend to be adverse to growth.

Despite the attention given to changes in the three policy variables discussed in this paper, it is not intended to assert that they are either necessary or sufficient for the target or performance variables to change. It must be recalled that certain important policy variables (e.g., the interest rate) and various other exogenous factors (e.g., external terms of trade, weather) left out of the empirical investigation also influence the target variables in this paper. Moreover, as the theoretical discussion indicates one cannot easily generalize on the basis of specific empirical instances. It is probably useful to emphasize that the underlying factors that are behind some empirical outcome must always be investigated. It is generally at least as important to know the underlying conditions necessary for certain relationships to hold as to know what the relationships have been during some historical periods.

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