Social and Economic Studies 40:1 (1991) *ISSN: 0037-7651*

A MONETARY APPROACH TO MOVEMENTS IN CARIBBEAN BALANCE OF PAYMENTS

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Abstract

Limited information on the form and structure of similar macroeconomic aggregates continues to hinder the design of appropriate stabilization policy throughout the Caribbean. The purpose of this paper is to estimate the parameters of a model — the Monetary Theory of the Balance of Payments — that is key to the IMF stabilization programmes in the region. On the basis of these results, countries are grouped on their conformity to the assumptions implicit in typical IMF stabilization programmes.

INTRODUCTION

The relationship between the International Monetary Fund (IMF) and the developing countries has tended to be volatile and frequently acrimonious. Recent writings document the controversy, breakdown, and re-establishment of relationships between the IMF and deficit countries such as Jamaica, the Dominican Republic and Venezuela, to name just a few. In each case, loan conditionality has been the core of the dispute (Williamson 1983).

As Keith Worrell (1985) has noted, one of the major problems in Jamaica's negotiations with the IMF, particularly in the 1970s, was the fact that (p. 265) "the Jamaican authorities were unable to supply reasonably respectable estimates of such parameters as the income and interest rate elasticities of the demand for money; as well as impressions about the stability of estimates over some

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reasonable period." As a result there is little question that many of the Fund's performance targets were based on guesswork and not on the underlying economic forces at work in the country at the time.

In recent years, several important studies have helped alleviate these informational gaps. In a rigorous examination of the demand for money in Jamaica Keith Worrell (1985) conclusively demonstrated that "whereas real balances had been a luxury good in the early stages of the development of modern Jamaica, in the latter stages they appear to have become an inferior good" (p. 273-74). More recently Leon's (1988) research indicates a good likelihood of the validity of the monetary theory of the balance of payments for Jamaica.

Limited information on the form and structure of similar macroeconomic aggregates however continues to hinder the design of appropriate stabilization policy throughout the Caribbean. The purpose of this paper is to estimate the parameters of a model — the Monetary Theory of the Balance of Payments — that is key to the IMF stabilization programmes in the region. On the basis of these results, countries are grouped based on their conformity to the basic assumptions implicit in typical IMF stabilization programmes. Finally several implications are drawn concerning Jamaica's experience with IMF programmes in the 1970s.

THEORETICAL CONSIDERATIONS

The monetary theory of the balance of payments derives its essential features from the classical specie flow mechanism, where an exogenous increase in the money stock in a country causes the price level to rise. The increase in price level diverts the demand abroad, leading to a deficit in the balance of trade. The trade deficit is financed through net monetary outflows, leading to a fall in the money stock and therefore prices, until international competitiveness is restored. As the prices return to their original level, the money stock also returns to its original level, implying that the

increases in the money supply have flowed abroad. In its simplest form, as described above, the specie flow mechanism seems to depend on two rather restrictive assumptions. First in identifying a trade deficit with an outflow of money, it assumes no international capital mobility. Second, the assumption that an outflow of money will lead to a fall in the domestic money stock implies that the same currency is used for both domestic and international transactions.

These shortcomings are overcome by the modern theory of the balance of payments (Johnson 1972; Frenkel and Johnson 1976), first by focusing on disequilibrium in the money market (rather than in trade balances); and second, by defining the domestic money stock as the sum of international reserves and domestic credit. Under the new theory, an exogenous increase in the money stock would increase the money supply in excess of the demand for it. People reduce their holdings of excess money by net purchases of goods or net acquisition of assets from abroad, which implies a balance of payments deficit and an outflow of international reserves. With a given quantity of domestically created credit, a loss of reserves means a reduction in the money supply. This process continues until all the newly created credit has flowed out abroad and the domestic money supply is again equal to the demand for it.

Aghevli and Khan (1977) have tested the monetary approach to the balance of payments model for 39 developing countries, and, drawing their highly significant results on a cross section basis, they maintain that the mechanisms underlying the monetary approach to the balance-of-payments theory holds equally strongly for both the developed and less developed countries.

As noted above, the objective of this study is to test this model for the Caribbean countries — to see if the significant results on a cross-section basis obtained by other researchers are also applicable to the region. It needs to be noted of course that not all the Caribbean countries have similar economic systems, and that such systems are also different from the economic systems of the industrialized countries.

ASSUMPTIONS

The monetary approach views the balance of payments problems as essentially transitory and self-correcting, provided the authorities do not sterilize the effects of the changes in reserves by means of compensating the changes in domestic credit. It assumes a completely liberalized system of trade and payments. Specifically it assumes that: (a) the domestic money supply is backed by only two components. i.e., international reserves and domestic credit; (b) the demand for money is a conventional function of prices, real income or output, and interest rates, and it is always stable; (c) the price level is determined in the world market according to the law of one price; (d) the interest rate is determined in the international capital market by the that, with international capital mobility, rates of return on function denominated in different currencies must be equalized: (e) a "small" country by its own actions cannot influence world prices or interest rates; and (f) real output is determined by real forces independent of the monetary factors or the balance of payments.

Thus the monetary approach assumes and relies on a rapid market-clearing process. It focuses on the interaction between assets and money markets in the determination of the exchange rate. Aspects such as substitution of currencies and financial assets, interest rate differentials, speculation, arbitrage, expected forward exchange rates and rational expectations from the focus in the monetarist approach. However an extensive use of exchange and capital controls exercised by a majority of the LDCs to deal with their balance of payments difficulties would render the assumptions underlying the market-clearing process as postulated by this theory implausible.

In a regime where exchange and capital controls are extensive, foreign capital mobility is extremely limited. That is restrictions occur due to the non-existence of integrated capital and foreign exchange markets and the presence of restrictions on trade and capital flows. Exchange controls rendered the currencies of many of these countries less than readily convertible and specifi-

cally hinder private capital flows. The assumption of perfect capital mobility is far from realistic for the analysis of balance of payments in these countries. Capital flows from and to the developing countries largely take place in the form of official transactions.

Concerning the trade sector, the mechanisms suggested by the monetary approach to the balance-of-payments theory — to reduce the balance-of-payments disequilibrium through a reduction in imports and an increase in exports — tends to ignore the fundamental difference between the determinants of levels of imports and exports in the developing and the industrialized countries (on whose structure the assumptions of the monetary approach to the balance-of-payments theory are based). Whereas in developed industrialized countries there usually exists substantial scope for substitution between export goods, import goods and non-traded goods and the level of imports will be responsible to relative prices, in the developing countries the demand for imports is generally held to be inelastic because a significant proportion of imports consists of the development imports for which there are no domestic substitutes. Second, tariff and non-tariff barriers to foreign trade are applied extensively, and they are not always governed by purely economic considerations, as social-political considerations may be more important in determining the trends in foreign trade.

Finally the structure of foreign trade in the developing countries (particularly the heavy dependence on imported technology and spare parts and the exports of raw materials mainly) implies that these countries simply cannot be categorized along with developed countries within the purview of the monetary approach to the balance-of-payments theory, which deals with the overall balance, while the balance-of-payments problems of the developing countries mainly originate in the current account or trade balance.

Therefore, keeping in view the pervasive market distorting in the developing countries affecting labour, foreign exchange, capital and commodity markets it seems quite obvious that the market

clearing process as postulated in the monetary theory cannot be generalized to hold equally for the less developed countries.

THE MODEL

The basic proposition of the monetary approach is that the balance of payments is a mechanism that restores equilibrium between the supply of and demand for money. Following McNown and Wallace (1977), this view can be summarized in a simple seven equation model. In equilibrium, money supply is equal to money demand:

(1) MS = MD

Assuming the money multiplier (the factor that relates the supply of money to the monetary base or reserve money) to be fixed (and for convenience equal to 1) equation (1) can be written in terms of the supply and demand for the monetary base, or:

(2) MB = MD

Where (MB) is equal to the monetary base. In turn, the monetary base is equal to the sum of net central bank foreign reserves, (R), and domestic assets (D), or:

(3) MB = R + D

Assuming the demand for money to be a function of nominal income (Yn) and the interest rate (i), MD can be written as:

(4) MD = f[Yn, i]

Equating (3) and (4), transforming from levels to changes, and solving for the change in foreign reserves (DR),

(5) DR = -DD + LyDYn + LiDi

where DR is the balance-of-payments surplus or deficit, LyDn and LiDi are the rates of change of monetary demand with respect to income and interest respectively.

An alternative formulation is obtained by assuming the demand for money to be homogeneous of degree one in prices so that:

(6) $MD = P^*L[Yp, i]$

where Yp is real income and i the interest rate. Equating (6) to (3) and transforming to percentage rates of change, the resulting equation is:

(7) $R * R/MB = - D * D/MB + ey*Yp + ei*i + P$

Where ey and ei are the income and interest elasticities of the demand for money and P, the price index. A dot over a variable symbolizes a percentage rate of change and R/MB and D/MB are weights used in the regression analysis.

Implied in this framework is that a nation will tend to gain international reserves as its real income and domestic price level increase (nominal income) and lose international reserves as it attempts to expand the money supply by increasing domestic assets or as the interest rate rises. Each of these effects, some of which appear paradoxical when viewed from a Keynesian perspective, is the result of the impact of indicated variable on the demand for or supply of money. Increases in real income induce an increase in the demand for money, while an increase in the interest rate reduces that demand. Furthermore, an increase in the price level reduces the real money supply and induces an inflow of reserves (McNown and Wallace 1977, p. 271).

The counter-intuitive signs on the interest rate and price level variables follow from the assumption that, in monetary equilibrium, domestic inflation and interest rates are loosely linked to and primarily determined by changes in the respective world rates. Consequently reserve flows induced by price or interest rate differentials between countries in the short run Keynesian world are absent in the monetarist world of long run equilibrium. This absence of price or interest rate differentials is assured by the substitutability among the goods and securities of the different countries. In the limiting case of perfect substitutability in the long run, interest rates and price levels are fully equalized across nations.

RELEVANCE TO THE BALANCE OF PAYMENTS

The relevance of this theory for the Caribbean nations may not be immediately obvious. In particular casual observation of the international payments situation facing the major Caribbean economies might lead one to believe that the reserve flow of these countries were determined almost exclusively by real variables (the price of bauxite, the volume of bauxite sales — Jamaica; the price of oil, the volume of oil sales — Trinidad, etc.) and it is difficult to see where the monetary factors could enter. However, it may well be that such an observation simply stems from a narrow view of the balance of payments — one that focuses on particular components of the balance of payments account rather than taking a unified view of the entire account.

On the other hand, casual observation indicates that Jamaica and the other major Caribbean countries have several structural conditions assumed by the monetarist theory. First, of all the Caribbean countries tend to have open economies, and consequently the flow of foreign reserves into and out of the country is a major source of changes in their monetary base. "Externally generated fluctuations in the balance of payments, associated with fluctuations in world demand for their exports are usually a major cause of changes in the money supply in underdeveloped countries." (Ally 1975).

Second, the thinness of capital markets in such countries precludes offsetting open market operations in government securities on the part of the central bank or monetary authority (Bloomfield 1957).

Open market sales or purchases of securities by the central bank to or from non-bank public could, if substantial enough, help to offset these primary changes, but the securities market is invariably too narrow to permit such offsetting to be carried very far.

In sum, a logical case can be made for the relevance of the monetary approach to balance-of-payments adjustment in the Caribbean.

EMPIRICAL RESULTS

To test the consistency and applicability of the monetary view to the Caribbean economies, estimates of the basic models presented above with the annual data for the fourteen economies (Tables 1 and 2) were made. Equations (5) and (7) as well as a variation on (7) which included the growth in nominal GDP (but did not include the inflation term) was estimated. Several United States interest rates were used as a proxy for the opportunity cost of holding money in the respective countries. The rates used were: the Government Treasury Bill Rate, the long term Government Bond Rate, the prime rate and the medium term Government Bond Rate. The interest rate with the highest statistical significance is the one reported in the results below. The justification of this approach is based on the assumption of a close linkage between national rates of return.

To obtain as much comparability as possible between countries an attempt was made to estimate the equations over a comparable period. However, because of incomplete data, the period varied somewhat from country to country:[1]

Jamaica (1960-1988)
Trinidad (1960-1987)
Barbados (1966-1988)
Guyana (1960-1988)
Dominican Republic (1960-1988)
Suriname (1967-1988)
Colombia (1960-1988)
Venezuela (1960-1988)
Honduras (1960-1988)
Mexico (1960-1987)
Haiti (1960-1987)
Bahamas (1973-1983)
Costa Rica (1960-1988)
Guatemala (1960-1988)
Nicaragua (1960-1983)

To determine if the oil shocks of the 1970s had significantly affected the pattern of reserve flows of the individual countries tests (Chow 1960) were performed to determine if the slopes of the reserve flow equations differed significantly between the pre-oil price increase years (1960-73) and the post oil price increase years (1974-1988). This test was performed using BMDP programme R1 (BMDP 1990) which computes an F test equal to the regression sum of squares over groups divided by the residual sum of squares within groups.

Those countries with significant F values for this period included: Jamaica, Venezuela and Suriname.

For each of these countries a dummy variable was added to the regression equations. This dummy had a value of 1 for the years (1960-73) and 2 for the years (1974-88).

Preliminary analysis indicated that for many of the countries the omission of one or two years produced a considerable change in the values of the estimated equations. Using the Mahalanobis Distance criterion for outlier (SPSS 1990) identification, estimates were also made of the sample omitting these extreme values.

With respect to the simple reserve flow model (Tables 1 and 2) several patterns are of interest:

1. For the British Caribbean (Table 1), Jamaica (equations 2 and 3) Trinidad (equation 4) and Barbados (equation 5) all demonstrated the presence of a fairly strong reserve flow mechanisms. The form of the estimated equation did vary from country to country, however with Jamaica experiencing a structural change associated with the oil price shocks.

2. On the other hand changes in foreign reserves in Guyana were not statistically related to changes in income of domestic assets. The reserve flows in the Bahamas were strongly related to changes in domestic assets, but not changes in income.

3. The Dominican Republic exhibited fairly strong reserve flows (equation 6), particularly after omitting 1987 (equations 7 and 8).

It should be noted, however, that the standardized coefficients on the domestic asset and income terms were considerably smaller than the corresponding coefficients in Barbados and Trinidad.

4. The results for Suriname indicate a relatively weak reserve flow mechanism with relatively small coefficients (equations 10 and 11) on the domestic asset term, and a marginal significance for the income variable.

5. The results for Haiti were relatively poor (equation 12) with only the domestic asset term statistically significant.

6. In general, the countries of Central and Northern South America (Table 2) demonstrated very strong reserve flow mechanisms. In particular Venezuela (equations 1, 2 and 3), Honduras (equations 4 and 5) Mexico (equations 6 and 7) and Colombia (equations 8, 9 and 10) had very high coefficients of determination and t values.

7. In contrast, Costa Rica (equation 11) and Nicaragua exhibited no evidence of the reserve flow mechanism.

8. Guatemala was an intermediate case with slightly over one half of the movement in its reserves accounted for by movements in domestic assets, income and the United States long term government bond rate (equation 13).

The results obtained through estimates of equation 7 above — the weighted percentage change in reserves — produced similar results with several notable exceptions (Tables 3 and 4). For the Caribbean countries (Table 3):

1. While Jamaica exhibited a strong pattern between movements in foreign reserves and domestic assets, the income terms (either nominal or real) were no longer statistically significant (equations 1, 2 and 3).

2. The results (equations 4 and 5) for Trinidad again showed evidence of a strong reserve flow pattern.

3. Reserve flows in the Bahamas were again highly correlated with movements in domestic assets, but not income (equations 6 and 7).

TABLE 1. RESERVE FLOWS IN THE CARIBBEAN: CHANGE IN FOREIGN RESERVES, 1960-88

(Standardized Coefficients)

	Independent Variables				Statistics		
Country	**DA**	**Yn**	**i**	**OIL**	**r2(adj)**	**F**	**DW**
Jamaica							
(1)	-0.97***	0.83***			0.614	22.51	2.08
	(-6.43)	(5.47)					
(2)	-0.87***	0.66***	0.28**		0.662	18.66	2.13
	(-5.82)	(4.02)	(2.13)				
Outlier Analysis 1986 Mahalanobis' Distance = 14.67							
Results Omitting 1986							
(3)	-0.76***	1.02***		-0.23**	0.828	45.58	2.72
	(-7.93)	(10.69)		(-2.80)			
Trinidad							
(4)	-0.88***	0.21***			0.957	293.41	2.48
	(-20.19)	(4.84)					
Barbados							
(5)	-0.91***	0.31**			0.755	33.34	2.54
	(-8.14)	(2.57)					
Guyana no statistically significant variables							

Bahamas							
(6)	-0.89**	0.02			0.714	11.04	1.90
	(-4.67)	(0.08)					
Dominican Republic							
(7)	-0.36**	0.89***			0.543	17.03	2.51
	(-2.30)	(5.75)					
Outlier Analysis 1987 Mahalanobis' Distance = 24.03							
Results Omitting 1987							
(8)	-0.50***	1.14***			0.901	119.05	1.79
	(-6.70)	(15.25)					
(9)	-0.50***	1.12***	-0.16**		0.926	109.86	2.37
	(-7.73)	(17.34)	(-3.05)				
Suriname							
(10)	-0.48**	0.33**			0.389	7.06	1.28
	(-2.47)	(1.71)					
(11)	-0.52**	0.44**		-0.31*	0.445	6.08	1.45
	(-2.80)	(2.23)		(-1.64)			
Haiti							
(12)	-0.54***	-0.01			0.229	4.87	2.09
	(-3.09)	(0.49)					

Notes: Dependent variable is the change in foreign assets. Interest rate for Jamaica is the Jamaican Bank Rate. Interest rate for the Dominican Republic is the United States medium term government bond rate. *** = significant at 99% level; ** = significant at 95%; * = significant at 90% level of confidence. DA = the change in domestic assets; Yn = the change in Gross Domestic Product; i = the change in the interest rate; OIL = oil dummy variable; r2 (adj) = the adjusted coefficient of determination; F = the F Statistic; DW = the Durbin/Watson Statistic.

TABLE 2. RESERVE FLOWS IN CENTRAL AND NORTHERN SOUTH AMERICA: CHANGE IN FOREIGN RESERVES, 1960–88

(Beta Coefficients)

	Independent Variables				Statistics		
Country	**DA**	**Yn**	**i**	**OIL**	**r2(adj)**	**F**	**DW**
Venezuela							
(1)	-0.83***	0.32***			0.791	52.11	1.55
	(-9.46)	(3.62)					
Outlier Analysis 1987 Mahalanobis' Distance = 25.03							
Results Omitting 1986							
(2)	-0.89***	0.31***			0.902	120.69	1.69
	(-14.51)	(5.00)					
(3)	-0.94***	0.33***		-0.19**	0.936	127.84	2.15
	(-14.51)	(5.00)		(-3.71)			
Honduras							
(4)	-1.09***	0.37***			0.896	117.04	1.81
	(-15.02)	(5.15)					
(5)	-1.08***	0.37***	-0.12**		0.907	88.95	1.74
	(-15.77)	(5.46)	(-2.02)				

Mexico						
(6)	-0.57***	0.43***		0.998	6446.53	2.00
	(-19.73)	(14.77)				
Outlier Analysis 1985 Mahalanobis' Distance = 24.57						
Results Omitting 1985						
(7)	-0.52***	0.49***		0.999	21903.03	1.85
	(-29.59)	(27.84)				
Colombia						
(8)	-0.84***	0.50		0.988	2243.11	2.13
	(-39.91)***	(23.92)***				
Outlier Analysis 1987 Mahalanobis' Distance = 21.22						
Results Omitting 1987						
(9)	-0.87***	0.42***		0.997	4379.88	2.13
	(-81.07)	(38.97)				
(10)	-0.88***	0.43***	+0.04***	0.998	4914.65	2.17
	(-99.65)	(50.24)	(4.17)			
Costa Rica						
(11)	0.20	-0.49**		0.227	4.97	0.87
	(1.22)	(-2.87)				
Guatemala						
(12)	-0.64**	0.30		0.266	5.88	1.22
	(-3.43)	(1.62)				

TABLE 2 (contd). RESERVE FLOWS IN CENTRAL AND NORTHERN SOUTH AMERICA: CHANGE IN FOREIGN RESERVES, 1960–88

(Beta Coefficients)

Country	Independent Variables				Statistics		
	DA	Yn	i	OIL	r2(adj)	F	DW
(13)	-0.71*** (-4.97)	0.39** (2.72)	-0.56*** (-4.48)		0.583	13.61	1.62
Nicaragua no statistically significant variables							

Notes: Dependent variable is the change in foreign assets. Interest rate for Honduras is the United States long term government bond rate. Interest rate for Colombia is the United States medium term government bond rate. Interest rate for Guatemala is the United States long term Government Bond Rates; *** = significant at 99% level; ** = significant at 95%; * = significant at 90% level of confidence. DA = the change in domestic asses; Yn = the change in Gross Domestic Product; i = the change in the interest rate; OIL = oil dummy variable; r2(adj) = the adjusted coefficient of determination; F = the F Statistic; DW = the Durbin/Watson Statistic.

4. Again in contrast to the results obtained for the change in reserves, weighted reserve flows in Barbados (equations 8, 9 and 10) while highly correlated with domestic assets, were no significantly related to the growth in income.

5. In contrast to the change in reserves, the weighted growth in reserves was highly significant in Guyana, with the growth in nominal income highly correlated with the growth in reserves (equations 11 and 12). While the real income term was not significant, both inflation (equations 14 and 15) and changes in the United States prime rate (equation 15) were statistically significant.

6. The results for Haiti (equations 16 and 17) and the Dominican Republic (equations 18-22) were roughly similar to those obtained in the change in reserves analysis.

With regard to the Central and Northern South American countries (Table 4):

1. As with changes in reserve flows, Venezuela, Honduras, Mexico and Colombia all exhibited a strong weighted growth in reserves pattern. The only possible exception was Venezuela where (equations 1, 2 and 3) the income terms were very weakly significant.

2. Guatemala (equations 17, 18 and 19) again showed evidence of a reserve flow mechanism albeit not as strong as the first four countries.

3. Again the only reserve flow link in Costa Rica (equations 14, 15 and 16) was with domestic assets. Nicaragua (equations 20, 21) and Suriname (equations 5 and 6) also followed this pattern.

SUMMARY AND CONCLUSIONS

Summarizing results obtained above, the sample countries seem to fall into four main groupings:

Strong Reserve Flow Patterns

Trinidad
Colombia
Honduras

TABLE 3. RESERVE FLOWS IN THE CARIBBEAN: WEIGHTED PERCENTAGE CHANGE IN FOREIGN RESERVES, 1960–88

(Beta Coefficients)

Country	DA	Yn	Yr	P	i	OIL
Jamaica						
(1)	-0.89***	0.15*				-0.14
	(-11.32)	(1.91)				(-1.73)
			r2(adj) = 0.832;		F = 45.72;	DW = 2.38
(2)	-0.91***		0.08			
	(-10.48)		(-0.96)			
			r2(adj) = 0.800;		F = 55.10;	DW = 1.99
(3)	-0.91***		-0.10	-0.22**		-0.82**
	(-10.48)		(-0.96)	(2.65)		(-3.46)
			r2(adj) = 0.870;		F = 46.62;	DW = 2.50
Trinidad (1960–1987)						
(4)	-0.84***	0.20***				
	(-18.37)	(4.44)	r2(adj) = 0.967;		F = 387.54;	DW = 2.86
(5)	-0.84***		0.10**	0.16***		
	(-17.59)		r2(adj) = 0.966;		F = 245.56;	DW = 2.88

Bahamas						
(6)	-0.94***	-0.02				
	(-6.31)	(-0.18)				
			r2(adj) = 0.826;		F = 20.05;	DW = 1.90
(7)	-0.94***		-0.05			
	(-6.38)		(-0.36)			
			r2(adj) = 0.829;		F = 20.43;	DW = 1.93
Barbados						
(8)	-0.84***	0.09				
	(-6.09)	(0.63)				
			r2(adj) = 0.632;		F = 19.06;	DW = 2.87
(9)	-0.84***		0.08			
	(-17.59)		(0.55)			
			r2(adj) = 0.631;		F = 18.92;	DW = 2.74
(10)	-0.86***		0.08	0.25**		
	(-10.48)		(-0.96)	(2.65)		
			r2(adj) = 0.685;		F = 16.23;	DW = 3.07
Guyana						
(11)	-0.8***	0.20**				
	(-15.32)	(3.43)				
			r2(adj) = 0.923;		F = 163.58;	DW = 2.07
(12)	-0.86***	0.22***		-0.11*		
	(-15.95)	(3.97)		(-2.13)		
			r2(adj) = 0.933		F = 125.95	DW = 2.37

TABLE 3. (Contd) RESERVE FLOWS IN THE CARIBBEAN: WEIGHTED PERCENTAGE CHANGE IN FOREIGN RESERVES, 1960-88

(Beta Coefficients)

Country	DA	Yn	Yr	P	i	OIL
(13)	-0.95***		-0.04			
	(-14.64)		(-0.61)			
			r2(adj) = 0.889		F = 109.08	DW = 1.75
(14)	-0.87***		0.02	0.25***		
	(-18.14)		(0.39)	(5.28)		
			r2(adj) = 0.946		F = 160.07	DW = 2.11
(15)	-0.85***		0.03	0.27***	-0.11**	
	(-19.79)		(0.76)	(6.57)	(-2.69)	
			r2(adj) = 0.957		F = 152.99	DW = 2.37
Haiti						
(16)	-0.67***	0.14				
	(-4.02)	(0.82)				
			r2(adj) = 0.357		F = 8.22	DW = 1.40
(17)	-0.63***		0.28*			
	(-4.24)		(1.87)			
			r2(adj) = 0.423		F = 10.53	DW = 1.64

Dominican Republic						
(18)	-0.58***	0.33**				
	(-4.13)	(2.31)				
			r2(adj) = 0.485		F = 13.72	DW = 2.51
(19)	-0.57***	0.34**		-0.25		
	(-4.21)	(2.53)		(-1.89)		
			r2(adj) = 0.533		F = 11.29	DW = 2.46
(20)	-0.64***		-0.09			
	(-4.27)		(-0.60)			
			r2(adj) = 0.384		F = 9.42	DW = 1.95
(21)	-0.54***		-0.07	0.4**		
	(-4.09)		(0.60)	(3.36)		
			r2(adj) = 0.563		F = 12.61	DW = 2.50
(22)	-0.53***		-0.03	0.43**	-0.21*	
	(-4.18)		(-0.27)	(3.44)	(-1.70)	
			r2(adj) = 0.595		F = 10.91	DW = 2.38

Notes: Dependent variable is the weighted growth change in foreign assets. *** = significant at 99% level; ** = significant at 95%; * = significant at 90% level of confidence. DA = the weighted growth in domestic assets; Yn = the growth in nominal Gross Domestic Product; Yr is the growth in real Gross Domestic Product; P is the rate of inflation; i = the growth in the interest rate. Change in the interest rate; OIL = oil dummy variable; r2(adj) = the adjusted coefficient of determination; F = the F Statistic; DW = the Durbin/Watson Statistic.

TABLE 4. RESERVE FLOWS IN CENTRAL AND NORTHERN SOUTH AMERICA: WEIGHTED PERCENTAGE CHANGE IN FOREIGN RESERVES, 1960–88

(Beta Coefficients)

Country	DA	Yn	Yr	P	i	OIL
Venezuela						
(1)	-0.96***	0.09*				-0.13**
	(-17.01)	(1.74)				(2.62)
			r2(adj) = 0.942;		F = 145.89;	DW = 1.83
	Outlier Analysis 1986 Mahalanobis' Distance = 17.87					
	Results Omitting 1986					
(2)	-0.99***		0.05			0.11**
	(-23.86)		(-1.21)			(3.04)
			r2(adj) = 0.968;		F = 262.26	DW = 1.85
(3)	-1.00***		-0.05			-0.11**
	(-19.66)		(-0.59)	(2.65)		(-2.04)
			r2(adj) = 0.936;		F = 132.88;	DW = 1.89
	Outlier Analysis 1986 Mahalanobis' Distance = 17.38					
	Results Omitting 1986					
(4)	-1.01***		-0.03			0.10**
	(-27.09)		(-0.77)			(2.14)
			r2(adj) = 0.967;		F = 387.54;	DW = 2.86

Suriname						
(5)	-0.85***	0.10				
	(-7.27)	(0.88)				
			r2(adj) = 0.787;		F = 36.04	DW = 2.40
(6)	-0.87***		0.02	0.25***		
	(-18.14)		(0.39)	(5.28)		
			r2(adj) = 0.946		F = 160.07	DW = 2.11
Honduras						
(7)	-0.93***	0.15**				
	(-16.16)	(2.71)				
			r2(adj) = 0.913		F = 143.43	DW = 2.11
(8)	-0.95***		0.17**			
	(-17.18)		(2.99)			
			r2(adj) = 0.917		F = 151.12	DW = 1.88
Mexico						
(9)	-0.75***	0.37***				
	(-11.26)	(5.60)				
			r2(adj) = 0.903		F = 121.37	DW = 2.20
(10)	-0.76***		0.28**	0.48***		
	(-11.79)		(3.49)	(5.86)		
			r2(adj) = 0.906		F = 84.53	DW = 2.14

TABLE 4. (Contd) RESERVE FLOWS IN CENTRAL AND NORTHERN SOUTH AMERICA: WEIGHTED PERCENTAGE CHANGE IN FOREIGN RESERVES, 1960–88

(Beta Coefficients)

Country	DA	Yn	Yr	P	i	OIL
Colombia						
(11)	-0.89***	0.28***				
	(-17.35)	(3.88)				
			r2(adj) = 0.937		F = 202.62	DW = 1.66
(12)	-0.87***		0.15**	0.22***		
	(-17.44)		(2.91)	(4.16)		
			r2(adj) = 0.942		F = 146.66	DW = 1.87
Costa Rica						
(13)	-0.57***	-0.18				
	(-3.95)	(-1.15)				
			r2(adj) = 0.356		F = 8.49	DW = 1.36
(14)	-0.57***	-0.02				
	(-4.27)	(0.45)				
			r2(adj) = 0.420		F = 9.06	DW = 1.39
Guatemala						
(15)	-0.75***	0.24**				
	(-6.73)	(2.75)				
			r2(adj) = 0.645		F = 25.57	DW = 1.62

(16)	-0.72***	0.30***		-0.26		
	(-6.73)	(2.75)		(-2.41)		
			r2(adj) = 0.703		F = 22.26	DW = 1.98
(17)	-0.80***		0.20	0.37**		
	(-6.97)		(1.31)	(2.54)		
			r2(adj) = 0.661		F = 18.52	DW = 1.86
Nicaragua						
(18)	-1.03***	0.09				
	(-6.07)	(0.19)				
			r2(adj) = 0.624		F = 18.46	DW = 2.61
(19)	-1.10***		-0.27			
	(-7.13)		(-2.20)			
			r2(adj) = 0.700		F = 25.53	DW = 2.12

Notes: Dependent variable is the weighted growth change in foreign assets. *** = significant at 99% level; ** = significant at 95%; * = significant at 90% level of confidence. DA = the weighted growth in domestic assets; Yn = the growth in nominal Gross Domestic Product; Yr is the growth in real Gross Domestic Product; P is the rate of inflation; i = the growth in the interest rate. Change in the interest rate: OIL = oil dummy variable; r2(adj) = the adjusted coefficient of determination; F = the F Statistic; DW = the Durbin/Watson Statistic.

Mexico
Venezuela

Moderate Reserve Flow Pattern

Jamaica
Barbados
Guatemala
Dominican Republic

Weak or no Reserve Flow Pattern

Haiti
Costa Rica
Bahamas
Suriname
Nicaragua

Unclassified

Guyana

In short there is considerable diversity with regard to the existence of the basic IMF assumptions concerning the mechanisms responsible for movements in the balance of payments. No doubt this fact helps explain the rather mixed results the Fund's programmes have had in the region.

In particular the results while good for Jamaica are certainly not those one would expect to find in an economy operating under purely monetarist rules. In particular the expected relationship between reserve flows and the interest rate does not appear to have been present.

The failure of the IMF programme in the 1970s may therefore, have been due to the single fact that the economy was in a slump and capital was flowing out. The programme's curtailing of aggregate demand worsened the slump while interest rate policies had no effect on stemming capital inflows or inducing new inflows. "Further the merchandise account was already subject to direct controls. Foreign exchange controls as well as controls over foreign borrowing and in the domestic market were also in effect. The

agreement on the details of monetary policy including the limits on the new public external borrowing as well as the absence of any policies to induce investment meant that the effective model was the IMF model. The point of the IMF tests was to reinforce this, whatever else appeared to have been allowed. The only way out was to raise the level of investment. But the government had no investment policy and monetary policy further depressed private domestic investment, especially in small businesses" (Brown 1981, p. 38).

Based on the above analysis, the main conclusion that can be drawn for the purpose of assessing the problems associated with economic management in Jamaica in the 1970s is that while the results presented above roughly confirm the proposition put forth by the IMF that monetary expansion will cause the balance of payments to deteriorate, the actual operation of the transmission mechanism in Jamaica and the relative size and timing of the effects of a change in policy are a matter of considerable doubt.

NOTES

[1]Data are taken from the International Monetary Fund *International Financial Statistics Yearbook,* various issues. The monetary base is reserve money, line 14. Net foreign assets are line 11 or if foreign liabilities are listed separately, net foreign assets are given by line 11 minus line 15c. Domestic assets are monetary base minus net foreign assets. Nominal income is line 99b. Real income is nominal income deflated by the GDP deflator, line 99bip. In cases where the GDP deflator was not available nominal GDP was deflated using the consumer price index, line 64.

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