

DEVALUATIONS, REAL EXCHANGE RATES AND
THE EXTERNAL SECTOR*

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CHAPTER 7

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ABSTRACT

This paper corresponds to Chapter 7 of the forthcoming book Real Exchange Rates, Devaluation and Adjustment: Exchange Rate Policy in Developing Countries. This work investigates several aspects related to exchange rates in developing nations. Theoretical models of equilibrium and disequilibrium exchange rates are developed; the behavior of real exchange rates is investigated for a large cross section of countries; and the effectiveness of devaluation is assessed for a group of 39 developing nations.

CHAPTER 7

Devaluations, Real Exchange Rates and The External Sector

For many years much of the controversy surrounding the IMF and the so-called orthodox adjustment programs has been centered on the effectiveness of nominal devaluations. The IMF critics have persistently argued that devaluations and their accompanying policies fail in one respect or another.¹ In this chapter we use data on the 39 devaluations episodes of Chapter 6 to investigate the way in which these devaluations affected the external sector in these countries. An important objective of this analysis is to determine whether these devaluations have "worked", and to find out why some devaluations seem to succeed while others seem to fail. The empirical analysis of Chapter 6 showed that in the vast majority of the 39 episodes the devaluations took place as a result of unsustainable pressures accumulated after a long period of severe macroeconomic disequilibrium. According to the theoretical discussion of Chapter 3 it is precisely under these initial disequilibrium conditions that a nominal devaluation may indeed be very effective. This chapter deals exclusively with the effects of devaluations on variables related to the external sector -- the real exchange rate, the current account, the parallel market premium and the accumulation of net foreign assets, among others -- with special emphasis being placed on the ability of nominal devaluations to generate a real exchange realignment. The analysis of the effects of devaluations on some of the most important real variables, including real output, employment, real wages and income distribution is relegated to Chapter 8.

Various possible criteria can be used to evaluate the "effectiveness" of a devaluation. However, the most convenient single indicator of the

effectiveness of a nominal devaluation is its impact on the real exchange rate. It is indeed through this channel that nominal devaluations seek to affect the external sector account. If a nominal devaluation generates and sustains a real devaluation, there will be forces at work that will tend to improve the current account and the balance of payments (recall the model in Chapter 3). If, on the contrary, a nominal devaluation fails to affect the RER an important, indeed crucial, channel will disappear. Although the RER effect is the most important indicator of the effectiveness of nominal devaluations, it is not a goal in itself; the ultimate targets are the external sector accounts.² For this reason the empirical analysis in this chapter concentrates on a number of variables -- including net foreign assets, inflation, capital flight and RERs. This analysis places special emphasis in investigating the role of accompanying macroeconomic policies in determining the degree of effectiveness of a devaluation.

7.1 Nominal Devaluations and Real Devaluations

In this section we investigate the reaction of real exchange rates in the period immediately following the 39 devaluation episodes of Chapter 6. In Table 7.1 the index of the bilateral (with respect to the U.S. dollar) real exchange rate one year before the devaluation, the year of the devaluation, and one, two and three years after the devaluation is presented. (In the Appendix to this chapter, Table 7A-1 contains data on a multilateral index of real exchange rates during the same period). Table 7.2 presents data on the ratio of the cumulative ex-post elasticity of the real exchange rate with respect to the nominal exchange rate for the year of the devaluation, one, two and three years after the devaluation. These elasticities can be interpreted as an "effectiveness" index of devaluation. They are

TABLE 7.1
 Evolution of Bilateral Real Exchange Rate Index
 After Devaluation^a

<u>Country</u>	<u>Year</u>	<u>Year Prior Devaluation</u>	<u>Year of Devaluation</u>	<u>1 Year After</u>	<u>2 Years After</u>	<u>3 Years After</u>
Argentina	1970	100	114.2	87.5	57.7	40.4
Bolivia	1972	100	108.2	134.5	90.5	90.2
Bolivia	1979	100	96.6	90.1	74.3	86.0
Colombia	1962	100	131.4	99.2	84.4	(125.0)*
Colombia	1965	100	148.2	127.1	(138.0)*	(142.6)*
Costa Rica	1974	100	117.6	110.2	110.6	112.8
Cyprus	1967	100	116.5	114.6	116.8	118.1
Ecuador	1961	100	115.0	112.0	105.7	101.1
Ecuador	1970	100	136.9	130.7	126.6	126.6
Egypt	1962	100	127.7	126.5	122.2	108.9
Egypt	1979	100	183.2	173.3	171.3	152.2
Guyana	1967	100	113.2	113.2	115.6	116.3
India	1966	100	146.8	129.5	130.1	131.9
Indonesia	1978	100	150.1	140.6	135.4	135.2
Israel	1962	100	151.2	143.9	131.9	129.5
Israel	1967	100	113.1	115.5	116.2	112.7
Israel	1971	100	109.8	102.9	96.6	88.9
Jamaica	1967	100	113.2	110.2	107.4	103.6
Jamaica	1978	100	148.9	136.5	122.4	118.5
Malta	1967	100	116.6	116.7	118.7	118.8
Nicaragua	1979	100	108.7	91.7	80.8	66.0
Pakistan	1972	100	228.6	188.6	176.8	160.7
Peru	1967	100	131.7	113.5	111.4	109.0
Philippines	1962	100	184.8	174.1	160.5	160.3
Philippines	1970	100	149.1	133.9	133.8	131.9
Sri Lanka	1967	100	122.1	117.8	114.9	112.5
Trinidad	1967	100	114.3	108.6	109.7	111.3
Venezuela	1964	100	135.1	135.9	137.3	138.1

Table 7.1 (cont.)

<u>Country</u>	<u>Year</u>	<u>Year Prior Devaluation</u>	<u>Year of Devaluation</u>	<u>1 Year After</u>	<u>2 Years After</u>	<u>3 Years After</u>
Yugoslavia	1965	100	127.8	194.3	87.4	95.9
<u>Average</u>		100	167.6	126.7	116.0	114.0
Bolivia	1982	100	115.8	131.9	n.a.	n.a.
Chile	1982	100	174.7	165.7	207.4	295.6
Colombia	1967	100	108.5	112.2	112.3	116.4
Ecuador	1982	100	116.4	129.6	125.5	181.6
Kenya	1981	100	132.6	138.9	136.8	145.5
Korea	1980	100	120.9	115.5	117.3	122.1
Mexico	1976	100	143.4	134.6	123.3	118.0
Mexico	1982	100	236.1	176.7	146.3	232.5
Pakistan	1982	100	124.9	125.3	136.9	174.8
Peru	1975	100	103.2	124.4	179.6	184.6
<u>Average</u>		100	137.8	135.5	142.8	174.6

^aAn increase in the index denotes a real devaluation.

* Means that a new devaluation took place that year; consequently the value of the index reported in parentheses is not relevant to evaluate the effectiveness of the devaluation.

Source: See text.

TABLE 7.2

Index of Effectiveness of Nominal Devaluations:

Ex-Post Real Exchange Rate Elasticities

Of Official Nominal Devaluation

<u>Country</u>	<u>Year</u>	(A)	(B)	(C)	(D)	(E)
		<u>Year of Devaluation</u>	<u>1 Year After Devaluation</u>	<u>2 Years After</u>	<u>3 Years After</u>	<u>Ratio of RER 3 Yrs. After to 3 Yrs. Prior</u>
Argentina	1970	0.57	<0	<0	<0	0.39
Bolivia	1972	0.12	0.52	<0	-0.14	0.92
Bolivia	1979	<0	<0	<0	-0.01	0.83
Colombia	1962	0.91	0.52	0.46	(0.24)	--
Colombia	1965	0.96	0.54	(0.50)	(0.48)	--
Costa Rica	1974	0.61	0.35	0.37	0.44	1.11
Cyprus	1967	0.90	0.87	1.00	1.08	1.23
Ecuador	1961	0.75	0.60	0.29	0.08	1.00
Ecuador	1970	0.95	0.79	0.68	0.68	1.21
Egypt	1962	1.16	1.10	0.93	0.37	1.07
Egypt	1979	1.05	0.93	0.90	0.66	1.39
Guyana	1967	0.82	0.78	0.96	0.98	1.16
India	1966	0.80	0.50	0.50	0.54	1.08
Indonesia	1978	0.99	0.79	0.69	0.63	1.12
Israel	1962	0.77	0.66	0.48	0.44	1.22
Israel	1967	0.79	0.93	0.98	0.76	1.05
Israel	1971	0.49	0.14	-0.17	-0.38	0.86
Jamaica	1967	0.83	0.60	0.45	0.22	1.03
Jamaica	1978	0.57	0.38	-0.23	0.19	1.07
Malta	1967	0.99	0.99	1.12	1.12	1.22
Nicaragua	1979	0.20	-0.19	-0.45	-0.78	0.64
Pakistan	1972	0.99	0.83	0.72	0.56	1.52
Peru	1967	0.71	0.30	0.26	0.20	0.91
Philippines	1962	0.90	0.79	0.65	0.64	1.50
Philippines	1970	0.77	0.53	0.47	0.44	1.34
Sri Lanka	1967	0.91	0.74	0.60	0.50	1.18

Table 7.2 (cont.)

		(A)	(B)	(C)	(D)	(E)
<u>Country</u>	<u>Year</u>	<u>Year of Devaluation</u>	<u>1 Year After Devaluation</u>	<u>2 Years After</u>	<u>3 Years After</u>	<u>Ratio of RER 3 Yrs. After to 3 Yrs. Prior</u>
Trinidad	1967	0.90	0.50	0.60	0.68	1.10
Venezuela	1964	0.92	0.94	0.98	0.99	1.37
Yugoslavia	1965	0.42	0.06	-0.02	-0.06	0.81
Bolivia	1982	0.02	0.02	n.a.	n.a.	n.a.
Chile	1982	0.85	0.53	0.47	0.52	2.27
Colombia	1967	0.51	0.49	0.38	0.39	1.48
Ecuador	1982	0.50	0.25	0.15	0.28	1.71
Kenya	1981	0.91	0.57	0.45	0.41	1.55
Korea	1980	0.58	0.35	0.32	0.34	1.09
Mexico	1976	0.73	0.42	0.28	0.21	1.08
Mexico	1982	0.51	0.17	0.07	0.10	2.05
Pakistan	1982	0.84	0.70	0.67	1.21	1.73
Peru	1975	0.20	0.31	0.34	0.20	1.93

Source: See text.

computed in the following form:

$$\text{Effectiveness Index}_k = \frac{\hat{RER}_k}{\hat{E}_k} \quad (7.1)$$

where k refers to the year of the devaluation, 1, 2 and 3 years after the devaluation. \hat{RER}_k is the percentage change in the real exchange rate between the year prior to the devaluation and k years after the devaluation ($k = 0, 1, 2, 3$). \hat{E}_k is the percentage change in the nominal exchange rate during the same period. This elasticity, then, provides an index of the degree of erosion experienced by the real exchange rate during the three years after the devaluation. A value of one means that the nominal exchange rate adjustment has been fully transferred into a one-to-one real devaluation. A negative value of the index, on the other hand, indicates that more than 100% of the nominal devaluation has been eroded and that, at that particular point, the real exchange rate is below its value one year before the crisis.

The value of this ex-post elasticity index measures in a very broad sense what percentage of the nominal devaluation has been "effective", in the sense of being translated into a real devaluation. The main reason why it is only a broad and somewhat inaccurate measure of "effectiveness" is that it is based on a "before" and "after" analysis, without maintaining other relevant variables constant. In Section 7.5 below, however, we report the results from an analysis that makes an explicit effort to control for other variables such as domestic credit policy, fiscal policy and foreign shocks. The last column in Table 7.2 includes the ratio of the real exchange rate index three years after the devaluation to three years prior to the devaluation and provides further information on how effective these

nominal devaluations have actually been.

These tables are very revealing, and provide a useful start for our analysis. Let us first focus on the cases of stepwise devaluation. The data in Table 7.1 show that in eight of the 29 episodes -- Argentina 1970; Bolivia 1972, 1979; Colombia 1962, 1965; Israel 1971, Nicaragua 1979 and Yugoslavia 1965 -- three years after the devaluation the real exchange rate index was below its value one year before the crisis. In all of these cases in less than three years the real effect of the nominal devaluation had more than fully eroded, and in some of the cases the erosion was very rapid. For example, in Argentina 1970, Bolivia 1979, Colombia 1962 and Nicaragua 1979, it took less than a year for the effect of the nominal devaluation to be completely wiped out.

Table 7.2 shows that in 12 of the 29 episodes the index of effectiveness was below 1/3 after 3 years -- Argentina 1970; Bolivia 1972, 1979; Colombia 1962, 1965; Ecuador 1961; Israel 1971; Jamaica 1967, 1978; Nicaragua 1979; Peru 1967; Yugoslavia 1965. These countries --with a major predominance of Latin American nations -- were unable to sustain a significant real devaluation following the nominal adjustment of the peg. While Columns (A)-(D) in Table 7.2 use the year prior to the devaluation as the benchmark for comparison, Column (E) looks at the value of the RER index 3 years prior to the devaluation. As can be seen, in many of these episodes the ratio of RER index three years after to three years before the crisis is above one, indicating that even though there has been significant real exchange rate erosion some correction with respect to three years prior to the crisis was achieved.

The data on the crawling peg countries present a different picture. In the nine cases for which there are data, three years after the devaluation

the RER index was higher -- and in most cases significantly higher -- than the year before the devaluation. Naturally, this was achieved by "fighting off" the real exchange rate erosion with additional devaluations in the following years. Typically, under crawling peg regimes the authorities further devalue the currency in magnitudes approximately equal to the domestic rate of inflation. Of course, a potential problem with this policy is that it can lead to an explosive (nonconvergent) process, where the devaluation generates inflation, which partially erodes the effect of the devaluation; this leads to a higher devaluation and an even higher inflation and so on, ad-infinitum. This would be the case, for example, if an unsustainable fiscal policy is maintained in our model of Chapter 3. An alternative scenario for the crawlers is one where the process is stabilized at some mild rate of inflation, as in Chile in the recent period, Colombia since 1967, Korea since 1980, and Pakistan after 1982.

Given the inflationary proclivity of a crawling peg regime, it is particularly useful to look at the effectiveness indexes of Table 7.2 when evaluating the successfulness of having adopted this regime. As can be seen from the table, in 4 out of 9 crawling peg episodes, the effectiveness index was below $1/3$ -- our "arbitrary" threshold for success. This means that whatever real devaluations were obtained in these countries, were achieved at the cost of important increases in inflation. Of the crawling peg countries, only in Chile, Colombia (1967), Kenya, Korea and Pakistan (1982), the rate of inflation 3 years after the crisis was below its level 3 years before the devaluation, as reported in Table 7.3. Also, these data indicate that among the crawlers in Bolivia, Peru and Mexico (1982) the higher real exchange rate was sustained at the cost of substantial medium to longer term increases in the rate of inflation.

TABLE 7.3

Inflation Rates in Devaluing Countries

<u>Country</u>	<u>Year of Devaluation</u>	<u>Inflation Rates (Percent)</u>			
		<u>3 Years Before</u>	<u>1 Year Before</u>	<u>1 Year After</u>	<u>3 Years After</u>
Argentina	1970	29.41	7.65	34.79	61.21
Bolivia	1972	2.22	3.69	31.49	7.88
Bolivia	1979	4.50	10.36	47.23	133.33
Colombia	1962	7.22	8.71	31.96	3.53
Colombia	1965	2.46	17.65	19.85	5.84
Costa Rica	1974	3.08	15.21	17.37	4.17
Cyprus	1967	-0.30	0.51	3.80	2.45
Ecuador	1961	1.34	1.68	2.87	4.03
Ecuador	1970	3.82	6.33	8.38	13.01
Egypt	1962	0.33	0.69	0.71	14.87
Egypt	1979	10.28	11.08	20.66	14.82
Guyana	1967	0.35	2.07	3.03	3.37
India	1966	3.08	9.21	13.59	1.72
Indonesia	1978	19.07	11.02	20.59	12.24
Israel	1962	4.40	6.71	6.57	7.70
Israel	1967	5.15	7.99	2.09	6.10
Israel	1971	2.09	6.10	12.88	39.71
Jamaica	1967	1.82	1.99	5.91	7.73
Jamaica	1978	17.38	11.19	29.08	12.74
Malta	1967	2.27	0.55	2.07	3.70
Nicaragua	1979	2.81	4.56	35.30	24.79
Pakistan	1972	1.21	7.73	23.07	20.90
Peru	1967	9.92	8.96	18.97	5.00
Philippines	1962	1.10	1.27	5.74	2.42
Philippines	1970	6.41	1.91	15.06	14.00
Sri Lanka	1967	3.13	-0.18	5.84	5.90
Trinidad	1967	0.83	4.15	8.23	2.52
Venezuela	1964	2.65	1.15	1.71	0.00

Table 7.3 (cont.)

<u>Country</u>	<u>Year of Devaluation</u>	<u>Inflation Rates (Percent)</u>			
		<u>3 Years Before</u>	<u>1 Year Before</u>	<u>1 Year After</u>	<u>3 Years After</u>
Yugoslavia	1965	10.47	10.89	26.17	5.00
Bolivia	1982	19.73	28.57	269.05	1.2x10 ⁴
Chile	1982	33.36	19.69	27.26	30.70
Colombia	1967	17.65	19.85	5.84	6.84
Ecuador	1982	10.27	16.39	48.43	27.98
Kenya	1981	16.89	13.80	20.40	10.18
Korea	1980	10.17	18.26	21.26	3.42
Mexico	1976	12.04	15.15	29.00	18.17
Mexico	1982	18.17	27.93	101.76	57.75
Pakistan	1982	8.27	11.88	6.15	5.83
Peru	1975	7.16	16.90	33.49	57.83

Source: International Monetary Fund.

Parallel Markets and Real Exchange Rates

The real exchange rate data in Table 7.1 were constructed using indexes on official nominal rates. However, as noted throughout this book, in these countries parallel markets of varying degrees of importance have traditionally existed. Data on nominal exchange rates in parallel markets were used to construct parallel market real exchange rate indexes. Table 7A-2 in the Appendix to this chapter contains these indexes. Naturally, the behavior of the parallel market real rates varied across countries, depending to a large extent on the way in which the parallel market spread reacted to the devaluation. Table 7.4 contains information on parallel market spreads and on the evolution of multiple exchange rate practices during the period following the devaluations. As can be seen, in most cases -- 25 out of 35 episodes -- the parallel market spread declined rapidly during the months immediately following the crisis (i.e., 3 months after the crisis). In a number of episodes, however -- 14 out of the 25 -- this decline was short-lived, and after 9 months the premium had once again increased. This evolution of the premia provides some important information, and is in broad agreement with the model developed in Chapter 3 and with the regression results of Chapter 5. In most instances, a large nominal devaluation of the official rate will, on impact, tend to reduce the gap between the freely determined parallel rate and the predetermined (i.e., fixed) official rate. As time passes, however, and other forces are unleashed, the freely determined black market rate starts responding to these forces and to expectations.

Table 7.4 shows that only a handful of these official devaluations were coupled with an exchange rate unification at a single higher official rate -- Bolivia 1972, Ecuador 1970, Pakistan 1972, Yugoslavia 1965, Bolivia 1982, and Korea 1980; in the case of Ecuador, however, this unification was very

TABLE 7.4
Multiple Rate Practices and Parallel Market Spreads
Following Devaluation

<u>Country</u>	<u>Year</u>	<u>Number of Official Rates</u>				<u>Parallel Market Spread</u>		
		<u>Year Prior</u>	<u>Yr. of Dev.</u>	<u>+1 Yr.</u>	<u>+3 Yrs.</u>	<u>Month Prior</u>	<u>+3 Mths.</u>	<u>+9 Mths.</u>
Argentina	1970	1	1	5	5	0	0.5	9.0
Bolivia	1972	2	1	1	1	60.0	32.5	5.0
Bolivia	1979	1	2	2	1	17.5	15.0	20.0
Colombia	1962	3	3	3	4	57.8	11.0	14.4
Colombia	1965	3	4	4	2	114.4	35.9	19.3
Costa Rica	1974	5	3	3	3	30.2	3.5	15.2
Cyprus	1967	1	1	1	1	n.a.	n.a.	n.a.
Ecuador	1961	2	2	2	2	66.7	30.8	57.3
Ecuador	1970	2	1	2	3	55.6	16.0	9.2
Egypt	1962	2	2	1	1	128.6	93.0	79.1
Egypt	1979	3	4	5	5	92.3	7.1	4.3
India	1966	1	1	1	1	134.2	53.3	54.7
Indonesia	1978	4	5	2	2	1.2	1.8	1.3
Israel	1962	1	1	1	1	50.8	9.2	13.9
Israel	1967	1	1	1	1	9.9	2.0	8.9
Israel	1971	1	1	1	1	6.9	28.8	36.0
Jamaica	1978	2	2	2	2	n.a.	n.a.	n.a.
Nicaragua	1979	2	5	3	6	92.9	97.0	47.8
Pakistan	1972	2	1	1	1	134.2	1.9	40.9
Peru	1967	1	2	3	4	43.6	1.6	13.7
Philippines	1962	2	2	2	1	126.0	5.4	7.6
Philippines	1970	1	2	2	2	59.0	19.1	7.3
Sri Lanka	1967	1	1	2	2	152.1	97.5	95.0
Venezuela	1964	3	2	2	2	35.2	0	0
Yugoslavia	1965	2	1	1	1	54.7	22.4	15.2

Table 7.4 (cont.)

<u>Country</u>	<u>Year</u>	<u>Number of Official Rates</u>				<u>Parallel Market Spread</u>		
		<u>Year Prior</u>	<u>Yr. of Dev.</u>	<u>+1 Yr.</u>	<u>+3 Yrs.</u>	<u>Month Prior</u>	<u>+3 Mths.</u>	<u>+9 Mths.</u>
Bolivia	1982	2	1	1	n.a.	434.0	180.0	300.0
Chile	1982	1	2	3	n.a.	17.9	2.4	10.6
Colombia	1967	4	3	2	2	48.1	30.7	15.4
Ecuador	1982	3	4	4	n.a.	74.4	76.4	118.7
Kenya	1981	3	3	4	n.a.	19.8	23.2	17.9
Korea	1980	2	1	1	1	42.3	5.3	7.0
Mexico	1976	1	1	1	1	0.0	0.0	0.0
Mexico	1982	1	2	2	n.a.	12.3	82.9	33.5
Pakistan	1982	1	1	1	n.a.	40.9	23.5	23.5
Peru	1975	4	5	5	4	75.7	55.6	77.8

Source: Various issues of Pick's Currency Yearbook and World Currency Yearbook.

short-lived. In a few other episodes the number of multiple rates was reduced -- Costa Rica 1974, Venezuela 1964, Colombia 1967 -- but multiple rate practices were not eliminated. Interestingly enough, and contrary to popular belief, instead of leading to unification, many of these devaluations were actually followed by a more generalized use of multiple rates, either the year of the devaluation or in the subsequent two years.

7.2 Devaluations and Macroeconomic Policies

In theory, and in particular according to the model in Chapter 3, whether nominal devaluations succeed or not in helping a country regain international competitiveness will largely depend on the accompanying macroeconomic policies. If the economic authorities do not put a check on the ultimate causes of the crisis -- that is, the inconsistent and unsustainable macroeconomic policies -- the effects of the exchange rate adjustment will indeed be very short-lived. In this section we analyze the role played by macroeconomic policies in the outcome of the 39 devaluation episodes.

Table 7.5 contains data on three of the indicators of domestic credit and fiscal policies considered in Chapter 6 (Table 6.2): (a) rate of growth of domestic credit; (b) rate of growth of domestic credit to the public sector; and (c) proportion of total domestic credit received by the public sector. If we consider the control group policies as a broad characterization of those policies "consistent" with maintaining a fixed rate, a comparison between the data in Table 7.5 and the control group can shed additional light on what is behind the degree of success of a devaluation.

One way of organizing this discussion is by assuming that the median values of these indicators for the control group provide an approximate (and conservative) measure of a policy consistent with maintaining a pegged rate.

TABLE 7.5
Macroeconomic Policies in Period Following Devaluation

<u>Country</u>	<u>Year of Dev.</u>	<u>Rate of Growth of Domestic Credit</u>		<u>Rate of Growth of Domestic Credit To Public Sector</u>		<u>Fraction Of Total Credit To Public Sector</u>	
		<u>+1 Yr.</u>	<u>+3 Yrs.</u>	<u>+1 Yr.</u>	<u>+3 Yrs.</u>	<u>+1 Yr.</u>	<u>+3 Yrs.</u>
Argentina	1970	41.9	94.7	14.3*	133.3	2.1*	4.8*
Bolivia	1972	31.2	38.5	4.1*	185.5	45.8	23.2
Bolivia	1979	38.1	343.2	62.5	411.7	44.8	53.0
Colombia	1962	16.7*	22.9	12.6	45.6	24.0	31.3
Colombia	1965	17.9	16.4*	-6.1*	-1.5*	24.9	21.5
Costa Rica	1974	45.2	30.9	161.5	126.5	14.1	21.4
Cyprus	1967	19.2	3.2*	-6.2*	-19.5*	-57.0*	-56.5*
Ecuador	1961	1.9*	10.8*	3.3*	-40.9*	10.9*	4.7*
Ecuador	1970	12.9*	7.7*	18.7*	-31.9*	27.7	16.0
Egypt	1962	20.4	7.3*	35.1	12.0*	52.1	57.5
Egypt	1979	42.1	23.1	13.9*	33.5	58.6	51.7
Guyana	1967	30.5	17.7	46.2	12.6*	27.9	30.5
India	1966	8.7*	9.7*	6.3*	3.9*	57.8	52.5
Indonesia	1978	4.4*	35.6	n.a.	-18.5*	-26.1*	-52.8*
Israel	1962	34.1	18.4	438.9	17.9*	12.7	13.1
Israel	1967	37.8	28.1	111.4	35.4	29.0	40.7
Israel	1971	12.5*	74.6	-5.5*	96.6	35.8	31.4
Jamaica	1967	22.5	20.2	29.5	394.1	6.7*	7.9*
Jamaica	1978	45.6	43.3	68.3	52.7	62.5	59.3
Malta	1967	44.5	29.9	382.7	60.9	5.9*	18.9
Nicaragua	1979	n.a.	31.5	n.a.	54.9	34.2	34.7
Pakistan	1972	9.0*	29.9	2.6*	41.1	46.2	48.4
Peru	1967	12.1*	13.2*	18.5*	-12.8*	36.2	25.0
Philippines	1962	25.3	6.2*	17.8*	-23.0*	12.2*	8.1*
Philippines	1970	11.9*	12.9*	5.0*	-47.7*	14.4	5.8*
Sri Lanka	1967	13.6*	10.0*	6.1*	9.6*	63.6	61.2
Trinidad	1967	17.3*	27.4	62.3	61.3	22.0	17.6
Venezuela	1964	10.7*	8.8*	20.7*	14.7*	-13.3*	-11.7*
Yugoslavia	1965	25.2	16.3	22.4*	-10.7*	9.4*	6.4*

Table 7.5 (cont.)

<u>Country</u>	<u>Year of Dev.</u>	<u>Rate of Growth of Domestic Credit</u>		<u>Rate of Growth of Domestic Credit To Public Sector</u>		<u>Fraction Of Total Credit To Public Sector</u>	
		<u>+1 Yr.</u>	<u>+3 Yrs.</u>	<u>+1 Yr.</u>	<u>+3 Yrs.</u>	<u>+1 Yr.</u>	<u>+3 Yrs.</u>
Bolivia	1982	171.3	5126.4	217.2	n.a.	62.0	n.a.
Chile	1982	10.9*	n.a.	36.7	n.a.	9.3*	n.a.
Colombia	1967	16.4*	17.2*	-1.5*	-6.3*	21.5	14.2
Ecuador	1982	59.2	n.a.	n.a.	n.a.	-6.5*	n.a.
Kenya	1981	28.6	10.3*	58.0	9.8*	41.0	33.4
Korea	1980	31.0	16.0*	84.9	2.3*	10.9*	9.6*
Mexico	1976	142.1	34.9	94.7	33.0	50.5	46.1
Mexico	1982	49.4	67.9	47.4	87.0	57.4	55.0
Pakistan	1982	14.5*	17.5	8.9*	4.4*	45.8	39.7
Peru	1975	54.3	54.1	113.9	55.4	32.5	35.2

Notes: These indicators were constructed from raw data obtained from the International Financial Statistics.

An asterisk (*) means that the value is less or equal to the median of the same variable for the control group of fixers.

The median values of the control group are 17.4% for the rate of growth of domestic credit; 22.7% for the rate of growth of domestic credit to the public sector; and 0.114 for the ratio of credit to the public sector to total domestic credit. In Table 7.5 we have used an asterisk (*) to denote those indicators with a value below the control group median. As can be seen in 29 of the 39 devaluation episodes the rate of growth of domestic credit was lower than the median for the control group (17.4%) in either one or three years after the devaluation. However, in only 8 of the episodes was this indicator below the control group median both 1 and 3 years after the devaluation -- Ecuador 1961, Ecuador 1970, India 1966, Peru 1967, Philippines 1970, Sri Lanka 1967, Venezuela 1964 and, the only crawler, Colombia 1967.

The analysis of the rate of growth of credit to the public sector shows in an even starker way the inability of some of these countries to impose fiscal discipline. In 14 out of the 29 stepwise devaluers this indicator exceeded (three years after the devaluation) the level of the third quartile (33.2%) for the control group, suggesting a greater tendency to maintain the unsustainable fiscal policy that got these countries into trouble in the first place. This tendency appears to be particularly common among the Latin American stepwise episodes -- in Argentina 1970; Bolivia 1972, 1979; Colombia 1962; Costa Rica 1974; and Nicaragua 1979 the rate of growth of domestic credit to the public sector exceeded the third quartile value for the control group of fixers.

A comparison of Table 7.5 on fiscal policy and Tables 7.1 and 7.2 on the evolution of the real exchange rate after the devaluation is particularly revealing. In 8 out of the 12 episodes where there was a rapid and significant erosion of the real devaluation, the macroeconomic indicator

shows highly "inconsistent" fiscal policies -- with the exceptions being Colombia 1965, Ecuador 1961, Peru 1967 and Yugoslavia 1965. This link is extraordinarily strong, providing persuasive preliminary evidence on the crucial role of accompanying fiscal policies in devaluation episodes.

Cross-Episode Regressions

A limitation of the analysis up to this point is that we have not attempted to separate the effects of the nominal devaluations from those of other policies or exogenous disturbances. In order to investigate more formally the way in which macroeconomic policies and devaluations interacted during the 29 stepwise devaluation episodes included in this part of the study, a number of cross section regressions were estimated. These equations took each devaluation episode as the observation unit, and considered the rate of change of the real exchange rate as the dependent variable. The independent variable included the nominal devaluation, the rate of growth of domestic credit, the change in the rate of growth of domestic credit to the public sector, and the change in the ratio of the fiscal deficit to GDP.

The equations estimated were of the following form:

$$\hat{RER}_k = \alpha_1 \hat{E}_k + \alpha_2 \hat{C}_k + \alpha_3 \hat{FIS}_k + u \quad (7.2)$$

where \hat{RER}_k is the cumulative percentage change in the real exchange rate between the year prior to the devaluation and k years after the devaluation (for $k = 0, 1, 2, 3$ years), for episode n . \hat{E}_k is the percentage change of the nominal exchange rate during the same period, for country n . Given the nature of the data set used, in most step-wise devaluation cases $\hat{E}_1 = \hat{E}_2 = \hat{E}_3 = \hat{E}$ - initial devaluation. \hat{C}_k is the rate of growth of domestic credit between year k and the year prior to the devaluation. \hat{FIS}_k is the change in an index of fiscal policy. The following indexes of

fiscal policy were actually used: rate of growth of domestic credit to the public sector (\hat{CPS}_k), growth in ratio of public sector to total domestic credit (\hat{RPSCR}_k); and change in fiscal deficit ratio (\hat{DEF}_k). The estimation of this equation allow us to have an idea on the average effects of our 29 stepwise nominal devaluation episodes on RERs maintaining (most) other things constant.³ It should be stressed that the purpose of these regressions is only to have a better understanding of the average effect of the 29 stepwise nominal devaluations, and not to undertake a thorough analysis of the process of RER determination. The lack of adequate data on the more important variables as well as the cross episode nature of these regressions dictate the more modest objective of this exercise. In particular, the absence of any "fundamentals" in equation (7.2) means that it cannot be interpreted as providing a full depiction of the process of RER determination; by concentrating on the role of macroeconomic variables only the current analysis is clearly of a short run nature. Remember, however, that the econometric investigation of Chapter 5 does provide a thorough analysis of RER determination based on the theoretical models of Chapters 2 and 3. In spite of the more modest claim made in this chapter, in the discussion that follows an effort is made to relate, when appropriate, the cross-episode results to the time series-cross section analysis of Chapter 5.

The results obtained are presented in Table 7.6. The different panels (A,B,C and D) refer to regressions for the year of the devaluation (panel A), one year after the nominal devaluation (panel B), two years after the devaluation (panel C), and three years after the devaluation. The coefficients of \hat{E}_k , for $k = 0,1,2$ and 3 , should be interpreted as providing a measure of the percentage of the nominal devaluation that, with (some of) the macroeconomic variables given, has been translated on average into a

TABLE 7.6
 Nominal and Real Devaluations:
 Cross-Section Results For Stepwise Episodes
 (OLS)

	\hat{E}_k	\hat{C}_k	CPS	$(RP\hat{S}CR)_k$	$(D\hat{E}F)_k$	\bar{R}^2
<u>Panel A: k = 0 years</u>						
	0.863 (23.451)	-	-	-0.030 (-0.624)	-0.006 (-3.346)	0.967
	0.857 (36.457)	-0.107 (-5.647)	-	-	-0.003 (-0.641)	0.914
	0.816 (32.628)	-	-0.014 (-0.717)	-	-0.002 (-2.134)	0.893
<u>Panel B: k = 1 year</u>						
	0.601 (9.701)	-	-	-0.119 (-1.917)	-0.014 (-2.471)	0.839
	0.722 (25.603)	-0.127 (-7.600)	-	-	-0.007 (-1.710)	0.843
	0.622 (20.491)	-	-0.005 (-0.512)	-	-0.015 (-1.974)	0.769
<u>Panel C: k = 2 years</u>						
	0.445 (5.438)	-	-	-0.035 (-0.809)	-0.001 (-0.651)	0.623
	0.602 (19.101)	-0.114 (-7.569)	-	-	0.028 (0.250)	0.748
	0.475 (14.776)	-	-0.002 (-0.978)	-	-0.013 (-0.107)	0.633
<u>Panel D: k = 3 years</u>						
	0.366 (4.720)	-	-	-0.049 (-1.938)	-0.004 (-1.030)	0.567
	0.554 (16.551)	-0.092 (-7.684)	-	-	-0.006 (-0.380)	0.693
	0.408 (12.136)	-	-0.008 (-0.946)	-	-0.014 (-0.798)	0.542

Note: Numbers in parentheses are t-statistics.

real depreciation 0, 1, 2 and 3 years after the devaluation. In all but one of the regressions in Table 7.6 the coefficients had the expected signs, confirming for these episodes that expansive macroeconomic policies resulted in an erosion of the real exchange rate effect of the devaluation. The coefficient of the nominal devaluation (\hat{E}) declined steadily as we moved away from the year of devaluation; for the year of the devaluation (Panel A) it exceeds 0.8 in all regressions, reaching significantly lower values -- ranging from 0.37 to 0.55 -- three years after the devaluation (Panel D). This illustrates the fact that even maintaining macroeconomic policies constant there will be some erosion of the real exchange rate effects of nominal devaluations. The negative coefficients of the macroeconomic policy variables provide a clear support to the hypothesis that unless nominal devaluations are accompanied by demand management policies, they will not have a lasting effect on the real exchange rate. This suggests that when a nominal devaluation fails to generate a sustained real devaluation, it is the whole macroeconomic package, and not only the devaluation, that has failed. Notice, however, that within the macroeconomic variables the rate of change of domestic credit (\hat{C}_k) is capturing most of the effect.

As noted, the regressions reported in Table 7.6 have been restricted to the devaluation episodes and have only considered macroeconomic policies as the other determinants of the evolution of RERs. It is interesting, then, to compare these results to those obtained in Chapter 5 where a general equation of RER dynamics that allowed a role for both monetary and real variables was performed. The results from that Chapter indicated that, with other things given, for the countries in that sample a nominal devaluation of 10% had had an effect on the real exchange rate during the first year of

approximately 6%, a magnitude compatible to the estimates in Table 7.6 for the effects one year after the devaluation ($k = 1$ year).

7.3 Devaluations, Exchange Controls and Payment Restrictions

As shown in Chapter 6, the vast majority of our devaluation episodes were preceded by a massive piling-up of exchange controls and trade restrictions. As these efforts to slow down, or halt, the erosion of international reserves failed, the economic authorities were eventually "forced" to devalue and implement some sort of a stabilization program. Table 7.7 contains a summary on the evolution of exchange controls and trade restrictions in the period following these devaluations.⁴ As can be seen from Table 7.7 in 21 of the episodes the devaluation was followed by some liberalization of trade restrictions and of controls applied to current account transactions; in 8 of these episodes capital account transactions were also liberalized after the devaluation. In 4 cases, however, we observe a mixed evolution of restrictions where some measures towards liberalizing the current account were undertaken at the same time as capital movement restrictions were hiked.

The general tendency towards liberalizing captured in Table 7.7 reflects the fact that in many cases after devaluing, and (somewhat) reestablishing the degree of international competitiveness of the country, the authorities usually felt that the controls imposed in the few years preceding the crisis were not needed any more. The combination of these trade liberalization programs with the devaluations make the evaluation of the impact of the latter on the trade account somewhat difficult. First, this reduction in the degree of trade restrictions will result in a change -- usually an increase -- of the equilibrium real exchange rate, making the

TABLE 7.7

Summary of Evolution of Exchange Controls and Trade Restrictions After The Devaluation

<u>Episode</u>	<u>Payment Restrictions on Current Transactions</u>	<u>Tariffs, Duties And Cost Related Measures</u>	<u>Restrictions on Capital Transactions</u>
Argentina (1970)	<ul style="list-style-type: none"> -Foreign exchange sales for several transactions were resumed. -One year after the devaluation, imports from the public sector and many "non-essential" imports were prohibited and a dual exchange market was reintroduced. 	<ul style="list-style-type: none"> -Import tariffs were reduced by 15 to 30 points in most items one month after the devaluation. -Tariffs were abruptly increased (up to 200%) five months later. 	<ul style="list-style-type: none"> -Profits and dividends remittances of foreign firms remain suspended. Services of foreign loans were permitted 9 months after the devaluation. -After 15 months all financial transactions were carried out at the floating dual rate.
Bolivia (1972)	<ul style="list-style-type: none"> -Restrictions on public sector imports were not lifted and the import of some agricultural final and intermediate goods was prohibited. 	<ul style="list-style-type: none"> -The 15% custom surcharge was eliminated one month after the devaluation but a substantial increase in tariffs took place one year later. 	<ul style="list-style-type: none"> -No significant change; most capital inflows and outflows took place through the "free" market.
Bolivia (1979)	<ul style="list-style-type: none"> -No significant changes. Prohibitions on automobiles and other vehicles were lifted. 	<ul style="list-style-type: none"> -The advance deposit requirement was reduced from 500% to 25% for most private imports. -Some deductions on paid duties were granted to importers. 	<ul style="list-style-type: none"> -The ceilings on short term and medium term foreign exchange liabilities of the banking sector were increased.
Bolivia (1982)	<ul style="list-style-type: none"> -The new official exchange rate was restricted to wheat and public imports one month after the devaluation. -All non-essential imports were prohibited 9 months after the devaluation. -Quotas for invisible payments were reduced drastically. 	<ul style="list-style-type: none"> -The 2% tax on exchange transactions was abolished after the devaluation. -The advance deposit scheme became highly restrictive 3 months later. 	<ul style="list-style-type: none"> -Only public debt service had access to the official exchange rate, all other transactions were made at the "free" rate. -The foreign exchange market was closed for 15 days, 7 months after the devaluation. -The system became highly restrictive 2 months later.

Table 7.7 (cont.)

Episode	Payment Restrictions on Current Transactions	Tariffs, Duties And Cost Related Measures	Restrictions on Capital Transactions
Chile (1982)	<p>-Significant tightening in foreign exchange controls. Quotas for services' payments were progressively reduced starting 3 months after the devaluation.</p> <p>-All imports became subject to prior approval 6 months after the devaluation.</p>	<p>-A 5% advance deposit for all imports was implemented.</p> <p>-Tariffs on imports doubled (from 10% to 20% on average) 7 months after the devaluation and a 12% tax surcharge on the purchase of foreign exchange was established 2 months later.</p>	<p>-A mechanism to bail out commercial banks' foreign debt was introduced, a special exchange rate was created for that purpose.</p> <p>-Restrictions on new foreign borrowing increased substantially.</p>
Colombia (1962)	<p>-Several items were transferred from the list of prohibited imports to the list of freely imported goods in the year following the devaluation.</p>	<p>-The advance deposit requirement of some import categories was reduced further.</p>	<p>-No significant change; except for public debt service all capital flows were channeled through the parallel market.</p>
Colombia (1965)	<p>-Imports were divided in two groups. One of them had access to a preferential exchange rate and required a license and the other did not require a license but was subject to a higher exchange rate.</p>	<p>-Advance deposits for goods imported at the highest exchange rate were reduced by 5% per month.</p>	<p>-One year after the devaluation commercial banks were required to maintain 100% reserves against their foreign currency liabilities and transactions in foreign exchange by residents were strongly restricted.</p>
Colombia (1967)	<p>-Licensing requirements were eliminated for products from 150 tariffs lines.</p>	<p>-The advance deposits requirements for most imports were progressively reduced.</p>	<p>-The holding of foreign currency deposits was abolished.</p> <p>-Regulations on payments and inflows of dividends and profits were simplified.</p>

Table 7.7 (cont.)

<u>Episode</u>	<u>Payment Restrictions on Current Transactions</u>	<u>Tariffs, Duties and Cost Related Measures</u>	<u>Restrictions on Capital Transactions</u>
Costa Rica (1974)	-Prior registration of imports in the Central Bank became obligatory.	-A temporary import surcharge of 10% to 50% was introduced 15 months after the devaluation.	-Several measures to impede capital flight were adopted. Resident-owned capital outflows were severely restricted and the interest rate on domestically held foreign currency deposits was raised.
Cyprus (1967)	-The open general license system was eliminated and most goods could be imported without restriction.	-No change took place. Advance deposits requirements were not introduced.	-The Central Bank forced the commercial banks to gradually transfer to it their foreign exchange assets.
Ecuador (1961)	-Several items were continuously shifted between the 2 import lists (essential and non-essential goods). No clear pattern can be detected.	-Advance deposits were increased from 50% to 100% on most List 2 imports one month after the devaluation.	-Registered capital transactions were made at a higher (fixed) exchange rate.
Ecuador (1970)	-Quotas on most service payments were eliminated.	-Some List 2 imports and all public imports were exempted from the 20% ad-valorem duty. -Advance deposits requirements were significantly reduced but were increased again 15 months after the devaluation.	-Private banks and residents were allowed to maintain foreign currency deposits one year after the devaluation.
Ecuador (1982)	-Significant increase in the degree of restrictiveness. A third exchange rate was created. -The import of 550 items was prohibited and several other imports were suspended for a year 6 months after the devaluation.	-Tariffs were increased in several final and intermediate goods. -The advance deposit requirement was hiked to 20%-80% 6 months after the devaluation.	-Several restrictions on public foreign borrowing were introduced. -Capital controls were severely tightened.

Table 7.7 (cont.)

<u>Episode</u>	<u>Payment Restrictions on Current Transactions</u>	<u>Tariffs, Duties and Cost Related Measures</u>	<u>Restrictions on Capital Transactions</u>
Egypt (1962)	-Private imports were prohibited 14 months after the devaluation.	-No change took place. Some imports were still subject to a 10% tariff premium.	-No change took place. Capital transactions remained strictly regulated.
Egypt (1979)	-The reunification of the exchange rates caused the lifting of all quotas on services and import payments.	-Import duties were reduced and an advance deposits scheme was introduced 15 months after the devaluation.	-The operations of foreign banks were slightly restricted.
Guyana (1967)	-The import of some items previously on the "negative list" was prohibited.	-No change took place. The advance deposit scheme remained in effect.	-No change took place. Capital transactions remained strictly regulated.
India (1966)	-Quantitative restrictions on intermediate imports were substantially relaxed. -Imports of 80 items were prohibited one year after the devaluation.	-No change took place. The advance deposit requirement was not reintroduced.	-No change took place. Capital inflows and outflows remained fairly unrestricted.
Indonesia (1978)	-No change took place. The import of most items remained highly regulated.	-Significant reduction in import duties and sales taxes (especially for intermediate imports).	-No change took place. Except for foreign investment, capital transactions remained fairly unrestricted.
Israel (1962)	-Significant liberalization. Previously prohibited items were allowed to be imported under individual licenses and several items were exempted from all licensing requirements.	-No change took place. Few items required an advance deposit.	-No change took place. Capital transactions remained fairly regulated.

Table 7.7 (cont.)

<u>Episode</u>	<u>Payment Restrictions on Current Transactions</u>	<u>Tariffs, Duties And Cost Related Measures</u>	<u>Restrictions on Capital Transactions</u>
Israel (1967)	-The process of lifting import restrictions continued after the devaluation. -The quotas for most services' payments were increased.	-Import duties were reduced by the same rate as the devaluation. -One year later they were reduced again by 10%-15%. -The advance deposit requirements were progressively reduced. -A preannounced plan for reducing tariffs and import duties was implemented.	-Regulations on capital transactions were eased.
Israel (1971)	-The process of reducing the licensing requirements for most imports continued after the devaluation. -The quotas for several services were further increased.	-Duties on some intermediate imports were reduced 9 months after the devaluation.	-No significant change. Banks were allowed to establish their own interest rates in foreign currency deposits.
Jamaica (1967)	-Slight increase in restrictiveness. Many imports were excluded from the open general license scheme and became subject to specific licenses.	-Duties on some intermediate imports were reduced 9 months after the devaluation.	-No significant change. -The free convertibility into sterling of the Jamaican pound was limited to dealings with commercial banks.
Jamaica (1978)	-The quotas for some services' payments were increased.	-No change took place. No advance deposit scheme was in effect.	-No change took place. Capital transactions remained strictly regulated.
Kenya (1981)	-No significant change. Most foreign exchange transactions continue requiring prior licenses. -The licenses started to be auctioned one year after the devaluation.	-The term of the advanced deposits was reduced and tariffs were lowered in several items. -Advance deposits became more strict one year after the devaluation.	-No significant change. Capital transactions remained strictly regulated.

Table 7.7 (cont.)

Episode	Payment Restrictions on Current Transactions	Tariffs, Duties and Cost Related Measures	Restrictions on Capital Transactions
Korea (1980)	<p>-No significant change. The import licensing requirement was maintained and the quotas for services' payments were increased slightly.</p>	<p>-No change took place. The advance deposit requirement and the 2.5% import surcharge were not removed.</p>	<p>-Restrictions on foreign investment were relaxed significantly. -The Korean-financial market was open to nonresidents and foreign currency deposits were allowed for some agents.</p>
Mexico (1976)	<p>-The import licensing requirement was progressively eliminated in the year after the devaluation.</p>	<p>-Substantial reduction in tariff rates. The average tariff was reduced from 20% to 9% approximately. -Subsidies of up to 40% of import duties were granted to some "basic" industries.</p>	<p>-Restrictions on capital movements were significantly relaxed. -Investment banks were allowed to hold foreign currency deposits.</p>
Mexico (1982)	<p>-Severe foreign exchange controls were imposed. A three-tier system was established and most imports were made at the free rate. -Quotas on services' payments were drastically reduced and some imports were made subject to prior license.</p>	<p>-No significant change took place. No advance deposit requirement was introduced and only a few tariff rates were raised.</p>	<p>-Abrupt increase in restrictiveness. -Foreign currency deposits were frozen and converted in domestic currency, payments on foreign debt were suspended and foreign currency holdings were almost banned. -The last restrictions were lifted 5 months later.</p>
Nicaragua (1979)	<p>-Most sales of foreign exchange remained strictly regulated. -Several non-essential imports were excluded from the official market 15 months after the devaluation.</p>	<p>-No change took place. The 30% import surcharge was not removed.</p>	<p>-Significant increase in restrictiveness. Foreign banks were nationalized and the banking system became strictly regulated.</p>

Table 7.7 (cont.)

Episode	Payment Restrictions on Current Transactions	Tariffs, Duties And Cost Related Measures	Restrictions on Capital Transactions
Pakistan (1972)	<ul style="list-style-type: none"> -Most imports were progressively exempted from licensing requirements and other types of quantitative restrictions. -Several quotas for services' payments were increased. 	<ul style="list-style-type: none"> -The advance deposit requirement was abolished. -Import duties were increased 15 months after the devaluation. 	<ul style="list-style-type: none"> -Residents were allowed to hold foreign currency deposits.
Pakistan (1982)	<ul style="list-style-type: none"> -No significant change. The import licensing requirement and the stringent quotas on services' payments were not eased. 	<ul style="list-style-type: none"> -A 5% surcharge was imposed on all imports 6 months after the devaluation. The surcharge was selectively increased 6 months later. 	<ul style="list-style-type: none"> -No significant change. Capital transactions remained strictly regulated.
Peru (1967)	<ul style="list-style-type: none"> -The number of prohibited imports increased significantly in the year after the devaluation. 	<ul style="list-style-type: none"> -Many import duties were increased 6 months after the devaluation. -A 10% to 35% sales tax surcharge was imposed on non-essentials imports. 	<ul style="list-style-type: none"> -Significant increase in restrictiveness. Interest payments and other capital transfers became strictly regulated.
Peru (1975)	<ul style="list-style-type: none"> -The number of permitted imports was increased slightly 9 months after the devaluation. -Some quotas for services' payments were increased marginally. 	<ul style="list-style-type: none"> -Import duties on several items were increased 9 months after the devaluation. 	<ul style="list-style-type: none"> -No significant change. Capital transactions remained strictly regulated.
Philippines (1962)	<ul style="list-style-type: none"> -The final phase of the "decontrol" program coincided with the devaluation. All remaining restrictions on foreign trade and payments were eliminated. 	<ul style="list-style-type: none"> -The advance deposit requirement was reduced from a range of 50%-150% to one of 25%-100%. Intermediate imports were exempted from this requirement. 	<ul style="list-style-type: none"> -The few remaining restrictions on capital transactions were eliminated.

Table 7.7 (cont.)

<u>Episode</u>	<u>Payment Restrictions on Current Transactions</u>	<u>Tariffs, Duties and Cost Related Measures</u>	<u>Restrictions on Capital Transactions</u>
Philippines (1970)	-A few remaining restrictions on trade payments were eliminated. -Quotas on services' payments remained effective.	-No change took place. The advance deposit scheme was not eliminated.	-Decrease in the degree of restrictiveness. -Remittances of profits and dividends became unregulated. -Residents were allowed to hold foreign currency deposits.
Sri Lanka (1967)	-Import licensing requirements were eased. The coverage of the open general license scheme was extended.	-Tariffs on essential imports were reduced and those on "non-essential" imports were raised.	-No change took place. Capital transactions remained strictly regulated.
Trinidad-Tobago (1967)	-The system remained highly restrictive. More imports were prohibited one year after the devaluation.	-No change took place. No advance deposit scheme was in effect.	-No change took place. Capital transactions remained fairly regulated.
Venezuela (1964)	-Several import licensing requirements were introduced one year after the devaluation.	-With the unification of the exchange market the subsidized rate for 25 tariff lines was eliminated.	-No change took place. Capital transactions remained fairly regulated.
Yugoslavia (1965)	-The allocation of foreign exchange for current transactions became less restrictive and discriminatory for domestic residents.	-Some import duties were reduced as the country became a member of GATT one year after the devaluation.	-Foreign currency deposits were allowed. -Regulations on foreign investment were not eased.

Source: Constructed from information obtained from various issues of the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions and from various issues of Pick's Yearbook and World Currencies Yearbook. For a more detailed analysis on the evolution of these policies see the Appendix 6C to Chapter 6.

"required" real exchange rate devaluation higher than with the controls. Second, given this policy mix -- devaluation with trade liberalization -- it is not surprising to find that in a large number of countries real imports grew at very fast rates during the three years following the crisis.

In a number of instances and in particular in the Latin American countries -- Argentina 1970, Bolivia 1972, Costa Rica 1974, for example -- the liberalization of trade was short-lived, being reversed after few months. Not too surprisingly, these are some of the countries for which the effect of the devaluation on the real exchange rate eroded fairly rapidly (recall Table 7.1), and where fiscal discipline could not be attained after the devaluation. The observations provide some preliminary evidence suggesting that the reversibility of trade liberalization reforms observed so often in the developing world may have its roots on lax fiscal policies. Overly expansive fiscal policies will usually undermine the degree of credibility on the sustainability of the liberalization reforms, generating "perverse" reactions in the private sector.⁵ To the extent that the authorities in the devaluing country are unable to impose fiscal discipline, the public will realize that the real exchange rate will soon become again overvalued and thus will not engage in the process of reallocating resources and redirecting production towards the "non-traditional exports" sector.

Table 7.7 shows that in some cases -- Peru 1967, Egypt 1962, Nicaragua 1979 -- the devaluation was accompanied by a sharp increase in trade and/or capital movements restrictions. This reflects the fact that in some countries devaluations were in fact implemented under an environment where the authorities saw them as partial remedies, without having a real intention to implement demand management policies alongside them.

7.4 The Current Account, Foreign Assets and Devaluation

In this section we investigate how devaluations affect the external sector in the 39 episodes, placing especial emphasis on the current account. Table 7.8 contains data on the evolution of the ratio of the current account balance to GDP, and the ratio of net foreign assets to money after the devaluation.⁶ These indicators compare the levels of these variables one and three years after the crisis with their levels one year before the devaluation, and refer to absolute changes. This table provides a broad summary on how the external sector of these economies evolved during the years following the abandonment of the peg. A first revealing fact refers to the difference in behavior in the short run (i.e., one year) and medium run (i.e., 3 years). While in a number of countries there was a deterioration in most of these indicators in the short run, the situation changed through time, and after three years there had been a substantial improvement.

In some countries there was a simultaneous deterioration of the current account and an improvement in the stock of net foreign assets. This apparently puzzling phenomenon is nothing more than a reflection of the fact that capital movements have played an active role in the period following the devaluation. While in some of the earlier episodes the devaluations were accompanied by substantial capital inflows, in the more recent cases capital flight has many times continued after the devaluation itself -- especially in those cases where the public deemed the magnitude of the devaluation as "insufficient". Moreover, as noted in Chapter 6, in a number of the earlier episodes the devaluation was part of an IMF-supported adjustment program which allowed the country in question to obtain substantial short and medium term resources; both from the international

TABLE 7.8

Behavior of External Sector Variables 1 and 3 Years After Devaluation

<u>Country</u>	<u>Year of Devaluation</u>	<u>Change Current Account Ratio^a</u>		<u>Change in Ratio of Net Foreign Assets^b</u>	
		<u>+1 Yr.</u>	<u>+3 Yrs.</u>	<u>+1 Yr.</u>	<u>+3 Yrs.</u>
Argentina	1970	-0.011	0.025	-0.029	-0.051
Bolivia	1972	0.014	-0.119	-0.036	0.138
Bolivia	1979	0.051	0.018	-0.144	-0.936
Colombia	1962	-0.008	0.025	-0.108	-0.042
Colombia	1965	-0.042	-0.021	0.028	0.060
Costa Rica	1974	0.056	0.011	-0.130	-0.002
Cyprus	1967	-0.005	-0.027	0.021	0.038
Ecuador	1961	0.017	-0.016	0.001	0.038
Ecuador	1970	-0.054	0.048	-0.062	0.213
Egypt	1962	-0.008	0.041	-0.074	-0.104
Egypt	1979	n.a.	0.060	0.270	0.345
Guyana	1967	0.074	0.040	0.005	-0.129
India	1966	0.007	0.006	-0.008	0.036
Indonesia	1978	-0.011	-0.055	0.239	0.359
Israel	1962	0.042	0.047	0.187	0.108
Israel	1967	-0.044	-0.025	-0.049	-0.308
Israel	1971	0.029	0.003	0.216	0.090
Jamaica	1967	-0.018	0.035	0.047	-0.026
Jamaica	1978	-0.052	-0.074	-0.293	-0.314
Malta	1967	-0.039	-0.055	-0.048	-0.203
Nicaragua	1979	-0.321	0.067	-0.019	0.134
Pakistan	1972	0.025	-0.048	0.088	0.001
Peru	1967	0.046	0.021	-0.038	0.094
Philippines	1962	0.035	0.005	0.009	0.007
Philippines	1970	0.001	0.014	-0.001	0.263
Sri Lanka	1967	-0.001	0.020	-0.107	-0.174
Trinidad	1967	0.032	-0.051	0.030	-0.044
Venezuela	1964	-0.028	0.007	0.014	0.008
Yugoslavia	1965	-0.014	-0.002	0.005	0.002

Table 7.8 (cont.)

<u>Country</u>	<u>Year of Devaluation</u>	<u>Change Current Account Ratio^a</u>		<u>Change in Ratio of Net Foreign Assets^b</u>	
		<u>+1 Yr.</u>	<u>+3 Yrs.</u>	<u>+1 Yr.</u>	<u>+3 Yrs.</u>
Bolivia	1982	n.a.	n.a.	-0.131	n.a.
Chile	1982	0.040	n.a.	-0.056	n.a.
Colombia	1967	-0.022	0.002	0.031	0.045
Ecuador	1982	0.068	n.a.	-0.088	n.a.
Kenya	1981	0.077	-0.029	-0.193	-0.115
Korea	1980	0.023	n.a.	-0.125	-0.193
Mexico	1976	0.013	-0.010	-0.030	-0.020
Mexico	1982	0.033	n.a.	0.016	0.001
Pakistan	1982	0.033	-0.011	0.044	-0.068
Peru	1975	0.036	0.050	-0.435	-0.768

^aChange in ratio of current account to GDP with respect to one year before devaluation.

^bChange in ratio of net foreign assets relative to one year before crisis.

private banks and from the IMF itself.

The data on the ratio of net foreign assets indicates that in a nontrivial number of countries the external situation in fact deteriorated after the devaluation, over and above the already precarious initial conditions of one year before the crisis. Interestingly enough, and not too surprising, most of those countries whose external position measured by the ratio of foreign assets, experienced a deterioration, are among those for which the effect of the devaluations on the RER eroded fully before three years -- Argentina 1970, Bolivia 1972, Colombia 1962, Bolivia 1979, Nicaragua 1979.⁷

The Peruvian episode of 1975 provides a fascinating contrast. As was reported in Table 7.1, in this episode the authorities were able to maintain, via successive devaluations and at the cost of a rapid increase in inflation, a relatively high real exchange rate during the three years following the crisis. However, as Table 7.8 shows, this was of no avail, and the external sector continued to deteriorate to the point that in 1979 the Peruvian government was forced to reschedule its massive foreign debt. This was largely the result of generalized expectations that the policies undertaken by the authorities were not consistent with a return to stability.

A Current Account Equation

In order to further investigate the relation between real exchange rates, macroeconomic policies and the current account, a number of current account equations were estimated.⁸ According to the model in Chapter 3 the current account will respond to RER changes as well as to changes in macroeconomic policies -- both monetary and fiscal -- and to changes in external conditions such as the international terms of trade. Table 7.9 reports the results obtained from the estimation of current account

equations of the following form suggested by Khan and Knight (1983):

$$\begin{aligned} \left(\frac{CA}{Y}\right)_t = & \alpha_0 + \sum_i \alpha_1 \log e_{t-i} + \sum_i \alpha_2 \text{EXCRE}_{t-i} \\ & + \sum_i \alpha_3 \text{DEH}_{t-i} + \sum_i \alpha_4 \log \text{GCGDP}_t \\ & + \sum_i \alpha_5 \log \text{TOT}_{t-i} + \sum_i \alpha_6 \text{GROWTH}_{t-i} + \sum_i \alpha_7 Q_{t-i} + \delta_t \quad (7.3) \end{aligned}$$

where, as before, (CA/Y) is the ratio of current account to GDP; e is the real exchange rate which was alternatively defined as the bilateral or multilateral rate; EXCRE is our measure of excess supply of credit defined in Chapter 5; DEH is the ratio of fiscal deficit to lagged high powered money; GCGDP is the ratio of government consumption to GDP; TOT is the international terms of trade index; GROWTH is the rate of growth of real output; Q_t are "other" variables and δ_t is an error term. The decision of which variables to include in this regression analysis was based on the model developed in Chapter 3.

Equation (7.3) was estimated using pooled data for the 12 countries of Chapter 5 -- India, Malaysia, Philippines, Sri Lanka, Thailand, Greece, Israel, Brazil, Colombia, El Salvador, South Africa and Yugoslavia. As mentioned in that chapter these are the only nations that have long enough time series for the relevant variables. These countries are a fairly representative group, accounting among them for 11 devaluation episodes. The results reported in Table 7.9 were obtained using a three stages least squares procedure, where the current account equation was part of a system that included either a RER equation or both a RER and parallel market spread equations of the type discussed in Chapter 5.⁹ In every case a fixed effect procedure for estimating pooled data was used, where in a first round time and country specific dummy variables were used. After testing for the

TABLE 7.9
 Estimates of Current Account Equations
 (3SLS)

<u>Equation Number</u>	<u>(7.3-1)</u>	<u>(7.3-2)</u>	<u>(7.3-3)</u>	<u>(7.3-4)</u>
Real Exchange Rate Variable:	RER	RER	REER	REER
$\log e_t$	0.095 (3.280)	0.065 (2.363)	0.095 (3.255)	0.067 (2.150)
$\log e_{t-1}$	-0.086 (-3.316)	-0.060 (-2.430)	-0.085 (-3.293)	-0.061 (-2.008)
$GROWTH_t$	-0.015 (-0.237)	0.010 (0.163)	-0.014 (-0.226)	-0.003 (-0.048)
$GROWTH_{t-1}$	-0.113 (-3.510)	-0.186 (-3.095)	-0.194 (-3.231)	-0.167 (-2.743)
$\log TOT_t$	0.052 (4.668)	0.055 (4.882)	0.053 (4.684)	0.057 (4.871)
$\log GCGDP_t$	-0.003 (-0.272)	-0.005 (-0.451)	-0.003 (-0.280)	-0.003 (-0.264)
DEH	-0.005 (-0.860)	-0.001 (0.198)	0.001 (0.100)	-0.002 (-0.322)
EXCRE	.	-0.051 (-3.359)	-0.054 (-3.449)	.
DCRE	-0.055 (-3.510)	.	.	-0.057 (-3.417)
N	220	220	220	207
R ²	0.976	0.999	0.937	0.928

Notes: These equations were estimated using a three stage least squares procedure. The other equations in the system were a RER equation of the form reported in Chapter 5 and a parallel market spread equation. The numbers in parentheses are t-statistics. N is the number of observations. When N is 220 observations a two equation system consisting of the RER and current account equations was estimated; an N of 207 means that a three equation system was estimated. R² refers to the weighted coefficient of determination of the system as a whole.

significance of each of these two groups of dummies, in the second round of estimation -- which corresponds to the results reported here -- only country specific dummies were included. According to the model developed in Chapter 3 we expect that in the estimation of (7.3), $\Sigma\alpha_1 > 0$, $\Sigma\alpha_2 < 0$, $\Sigma\alpha_3 < 0$, $\Sigma\alpha_4 < 0$, $\Sigma\alpha_5 > 0$, and $\Sigma\alpha_6 \geq 0$. In determining the number of lags to include for each right hand side variable an effort was made to maintain parsimony. In the initial steps of the analysis up to four lags of each variable were included. In second rounds an effort was made to reduce the number of lags by dropping the insignificant coefficients. Broadly speaking the results reported in Table 7.9 confirm our hypotheses. In all equations the coefficient of the contemporaneous real exchange rate was significantly positive while the lagged real exchange rate had a significantly negative coefficient. The sum of e_t and e_{t-1} was in all regressions significantly positive, indicating that with other things equal real exchange rate depreciation have positively impacted these countries' current accounts. These results also show that even with a constant real exchange rate expansive domestic credit policies will have a negative effect on the current account balance. Interestingly enough, while the coefficient of DEH has the expected sign in three of the equations, it was never significant. The positive coefficient of $\log \text{TOT}$ indicates that in these countries better terms of trade improvements have generally resulted in current account improvements.

7.5 Successful and Unsuccessful Devaluations

What makes a devaluation "successful"? This has been the main question this chapter has addressed. In this section we pull together the discussion of the previous sections, and we make an attempt to formally classify our 39

episodes in "successful" and "unsuccessful" devaluations. In doing this, we keep in mind the fact that devaluations are usually only one component of broader stabilization packages.

In classifying these episodes in successful and unsuccessful we have concentrated on the behavior of three key indicators during the period following the devaluations: (1) Real exchange rates. Our focus here is on the behavior of the effectiveness index defined in Section 7.1 and reported in Table 7.2. The most important property of this index is that it allows us to capture the inflationary consequences of the devaluations. This is particularly important for the crawling peg countries since, as noted above, almost by definition a crawler can sustain a real depreciation by continuously increasing the country's rate of inflation. (2) Behavior of net foreign assets of the monetary system; and (3) behavior of the current account ratio. Given the difficulties associated with classifying in a clear cut fashion some of these episodes, a three way classification was used: (1) successful episodes; (2) unsuccessful episodes; (3) devaluations with a limited degree of success.¹⁰

In order for an episode to qualify as successful the following two conditions have to be met: (1) three years after the devaluation the effectiveness index had to exceed 0.3; and (2) three years after the devaluation either the current account or net foreign assets indicators had to exhibit an improvement relative to the year before the crisis. The first requirement implies that in order for an episode to be classified as successful no more than 70% of the devaluation impact on the real exchange rate has to be eroded in three years. The second requirement means that a real depreciation per se is not enough for the nominal devaluation to be considered a success; in addition, the external sector accounts have to be

improved. An episode was defined as unsuccessful if three years after the devaluation the real exchange rate was below its value the year before the crisis -- that is, the effectiveness index was negative -- or if even when the effectiveness index was positive (but still below 0.3) both the net foreign assets and current account positions had worsened 1 and 3 years after the devaluation. These definitions of success and failure are quite strict and are able to sharply discriminate between countries. A number of episodes, however, sit in between these two extreme groups. We have called them limited-success episodes, since in most of them we observe some improvement in the level of the real exchange rate and/or the external sector accounts.

Table 7.10 contains the 39 episodes classified according to this criterion. As can be seen, among the 29 stepwise devaluers, there are 13 clearcut successful cases, 9 clearcut failures and 7 limited-success cases. For the 10 crawlers there are three successful episodes, five unsuccessful ones and two cases of limited success.

The 13 successful stepwise devaluers (Panel A.1 of Table 7.10) were able to sustain substantial real depreciations in the medium term. The average for the effectiveness index after 3 years is 0.66 indicating that on average 2/3 of these nominal devaluations had been transmitted into a real devaluation. For these 13 countries as a group, 3 years after the crisis the RER stood on average 26% higher than its value immediately before the devaluations. For the 9 stepwise cases with limited success (Panel A.2 in Table 7.10) the average value of the effectiveness index is still an impressive 0.49, while the average ratio of the RER three years after to three years prior to the crisis is only 1.05. On the whole, then, this evidence strongly shows that for a large number of cases nominal devaluations have

TABLE 7.10

Successful and Unsuccessful Devaluations

A. Stepwise DevaluersA.1. - Successful Devaluation Episodes

Costa Rica	1974
Cyprus	1967
Ecuador	1970
Egypt	1979
Guyana	1967
India	1966
Indonesia	1978
Israel	1962
Pakistan	1972
Philippines	1962
Philippines	1970
Sri Lanka	1967
Venezuela	1964

A.2. - Limited-Success Devaluations

Egypt	1962
Ecuador	1961
Israel	1967
Jamaica	1967
Malta	1967
Peru	1967
Trinidad	1967

A.3. - Unsuccessful Devaluations

Argentina	1970
Bolivia	1972
Bolivia	1979
Colombia	1962
Colombia	1965
Israel	1971
Jamaica	1978
Nicaragua	1979
Yugoslavia	1965

B. CrawlersB.1. - Successful Crawlers

Chile	1982
Colombia	1967
Korea	1980

Table 7.10 (cont.)B.2. - Limited-Success Crawlers

Kenya	1981
Pakistan	1982

B.3. - Unsuccessful Crawlers

Bolivia	1982
Ecuador	1982
Mexico	1976
Mexico	1982
Peru	1975

Source: See text.

been helpful in generating real exchange rate realignments.

Let's now turn to the unsuccessful episodes. For the 9 unsuccessful stepwise episodes the index of devaluation effectiveness had an average of -0.21 three years after the crisis, indicating that at that time the RER was more than 20% below its value immediately prior to the crisis. For these cases devaluations not only failed to generate a real exchange realignment, but even worse, three years after the event the magnitude of the external disequilibrium had greatly increased. In fact, for these countries in the three years following the devaluation the net foreign assets ratio declined on average by more than 10%.

Why did devaluations fail so miserably in these countries? According to the model in Chapter 3 and to our previous analysis the answer to this issue should be sought in the realm of the macroeconomic policies that accompanied these devaluations. An analysis of macroeconomic indicators for these episodes shows that in all but one of these countries macroeconomic policies were highly inconsistent, in the sense of greatly exceeding for each indicator, the median or even the third quartile for the control group (see Table 7.5). The only exception is Yugoslavia, which on the face of the macroeconomic indicators looks like a reasonably "successful" country.

Discriminant Analysis

Our analysis until now has placed great emphasis on the role of accompanying macroeconomic policies when evaluating the degree of success of a devaluation. In order to formally check this relation between success and macroeconomic policies a discriminant analysis was performed. The purpose of this analysis was to test whether it is possible to statistically discriminate among successful and unsuccessful groups based on the behavior of macroeconomic variables only. That is, we want to find out whether these

two groups indeed pursued macroeconomic policies (domestic credit and fiscal policies) that are significantly different from a statistical point of view.

In performing the discriminant analysis the 13 successful and the 7 limited-success stepwise devaluers were lumped into one grand group of "success"; the 9 "unsuccessful" episodes of Table 7.10 were taken as the second group. The following four macroeconomic indicators were used to determine whether our 29 episodes were indeed correctly classified as successful or unsuccessful: (1) rate of growth of domestic credit; (2) rate of growth of domestic credit to the public sector; (3) ratio of public sector to total domestic credit; (4) increase in domestic credit to public sector to GNP. The results obtained are reported in Table 7.11; they are very satisfactory and indicate that by and large we can indeed statistically discriminate between these two groups on the basis of their macroeconomic policies only. According to these results, three years after the devaluation only one country which was classified as successful in Table 7.10 did not belong to that group: Egypt 1979. The posterior probability of it belonging to the successful group was only 2%. On the other hand, only 3 countries preliminarily classified as unsuccessful turned out to be misclassified in the sense that the posterior probability of them belonging to the "success" group exceeded the posterior probability of them belonging to the unsuccessful group. These countries were (with posterior probabilities of belonging to the unsuccessful group in parentheses): Yugoslavia (8%), Colombia 1962 (14%) and Colombia 1965 (8%). These results confirm the existence of a strong and statistically significant relation between macroeconomic policies and successful stepwise devaluations. Indeed, the discriminant analysis results indicate that one can safely use macroeconomic performance -- as measured by our four indicators -- to classify most of our

TABLE 7.11
 Discriminant Analysis for Macroeconomic Policies
 Of Successful and Unsuccessful Stepwise Devaluers*

	<u>Proportion of "Successful" Classified as Such Accord- ing to Macro Policies</u>	<u>Proportion of "Unsuccessful" Classified As Such According To Macro Policies</u>
1 Year After	68%	100%
3 Years After	95%	67%

*Classification based on generalized squared distant function.

29 stepwise episodes in "successful" and "unsuccessful" groups.

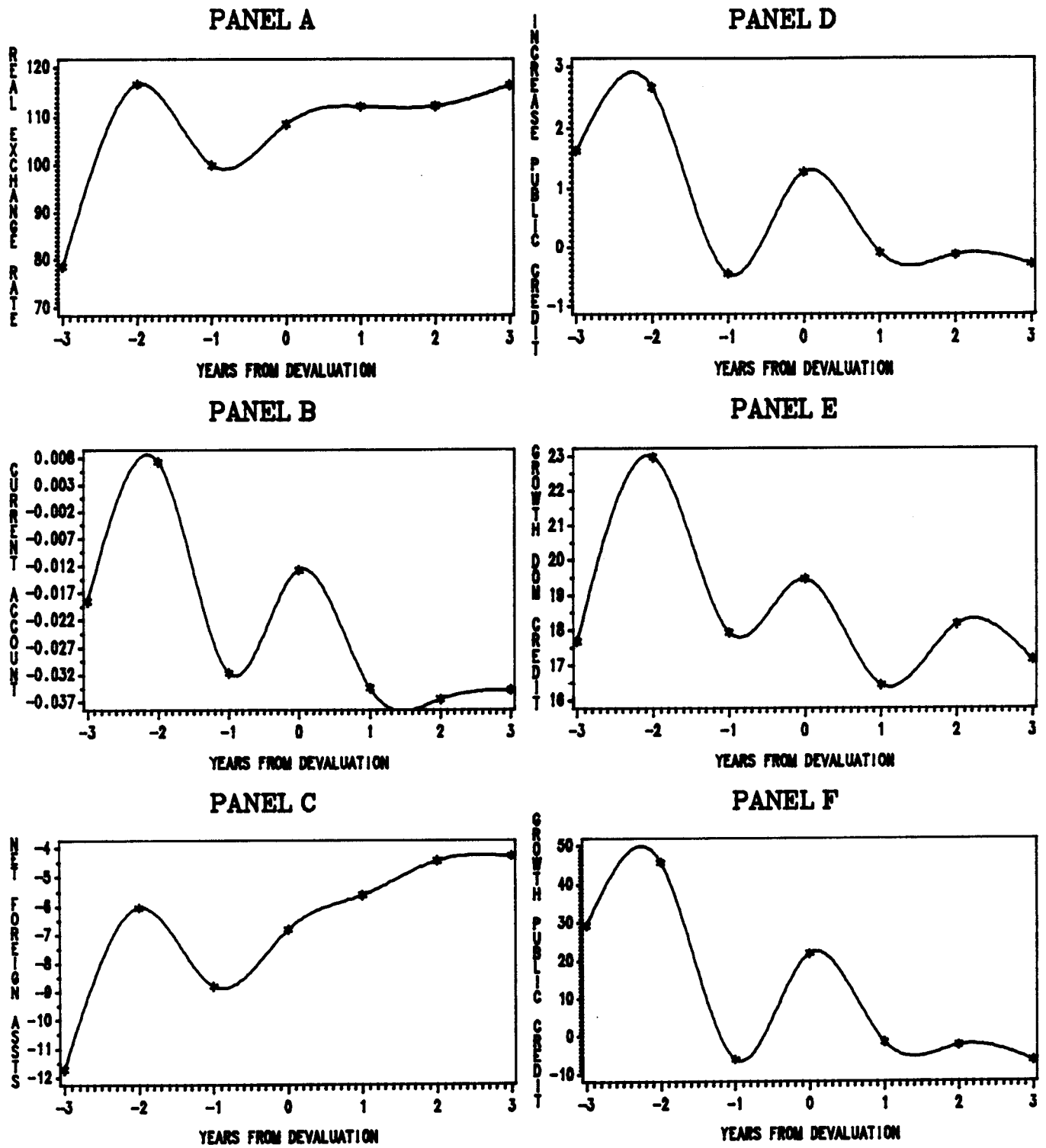
In classifying the crawlers special attention was placed on the effectiveness indexes. The 5 episodes classified as "unsuccessful" were characterized by high rates of inflation after the initial devaluation, meaning that they had to greatly devalue the nominal exchange rate to attain a modest adjustment of the real exchange rate. Also, in these "unsuccessful" crawlers the external sector accounts performed poorly.

Another important determinant of the degree of success of nominal devaluations is the wage indexation policy. If, as discussed in more detail in Chapter 8, the nominal wage rate is fully indexed to (past) inflation, nominal devaluations will be self-defeating. In this case the higher nominal exchange rate will be translated into higher wages and these, in turn, will be reflected on a higher price of nontradables generating an offset to the devaluation. Unfortunately the lack of data precludes a detailed systematic cross country analysis on the role of indexation. However, episodic evidence from countries such as Brazil, Colombia, and Chile strongly suggest that the existence of strict indexation rules has historically conspired to render nominal devaluations ineffective.

Success and Failure: A Diagrammatic Representation

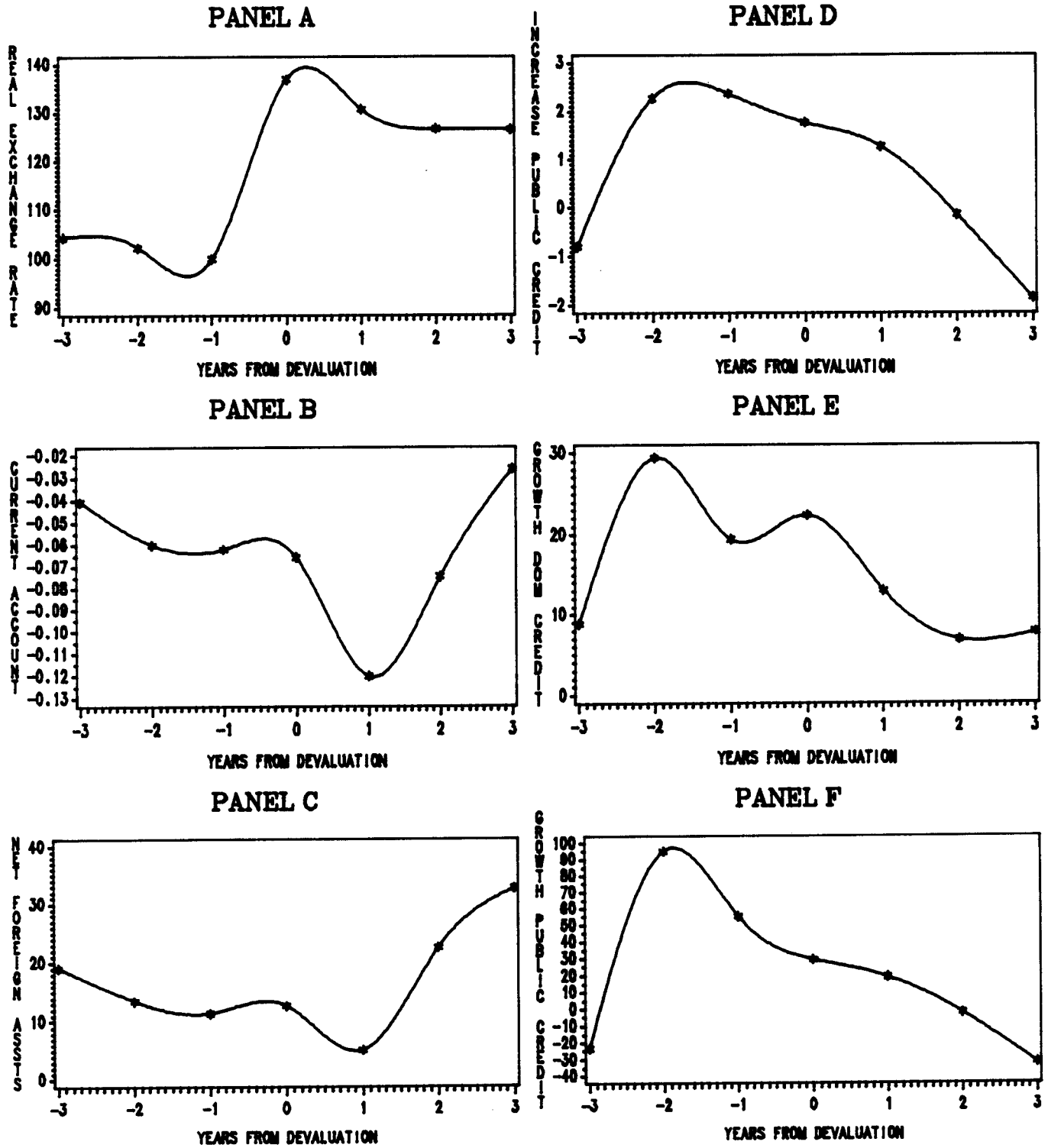
Figures 7.1 through 7.8 provide a vivid illustration on the performance of four broadly defined successful devaluations -- Colombia 1967, Ecuador 1970, Kenya 1981 and Philippines 1970 -- and four unsuccessful ones -- Bolivia 1979, Jamaica 1978, Mexico 1976 and Nicaragua 1979. Each of these figures contains 6 panels that trace the behavior of 6 key variables during the 7 years surrounding the devaluations. While panels A through C deal with endogenous variables related to the external sector, panels D through F refer to macroeconomic policy variables. The exact variables depicted in

FIGURE 7.2
COLOMBIA 1967



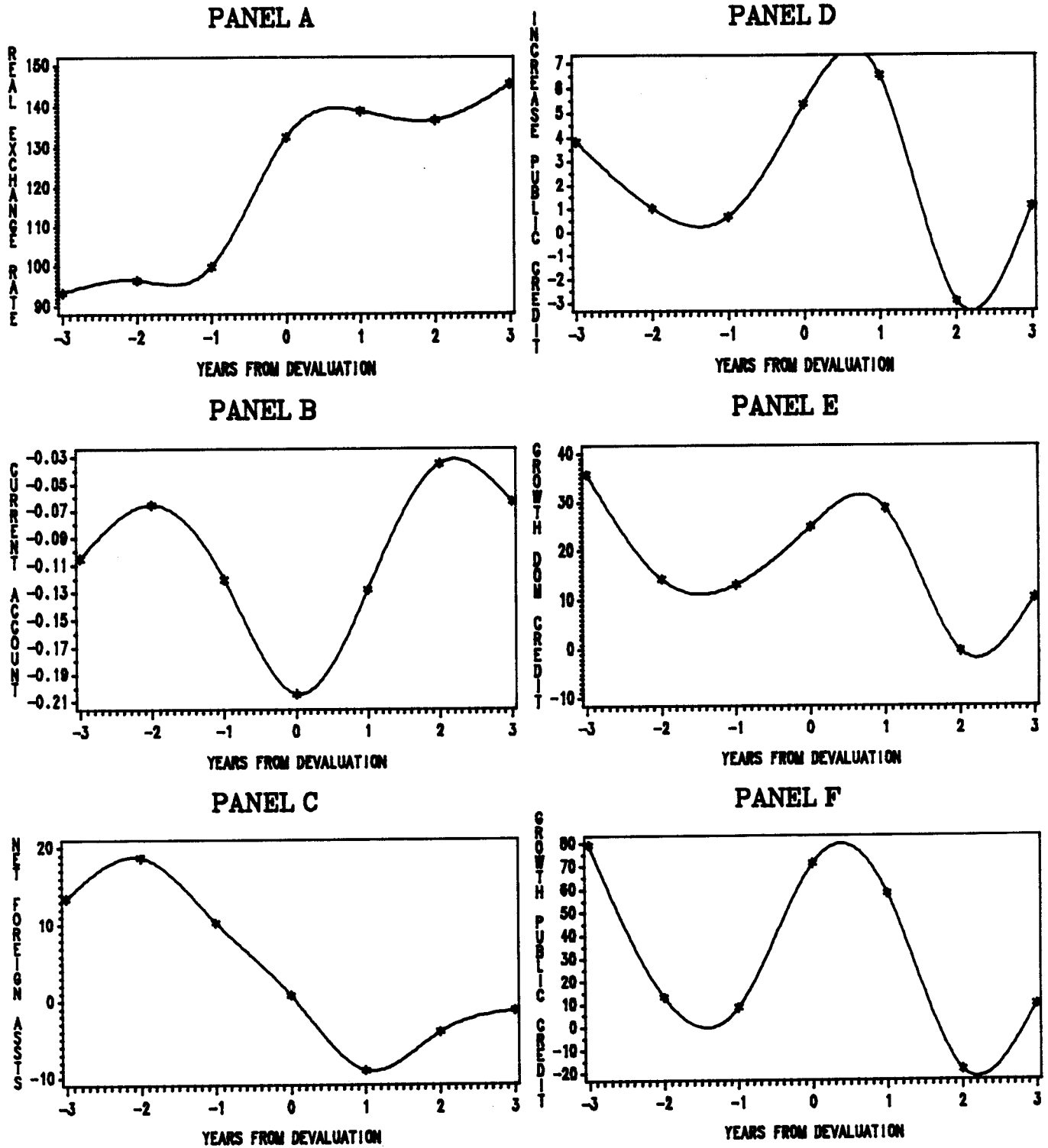
SOURCE: CONSTRUCTED FROM RAW DATA OBTAINED FROM THE I.F.S.

FIGURE 7.3 ECUADOR 1970



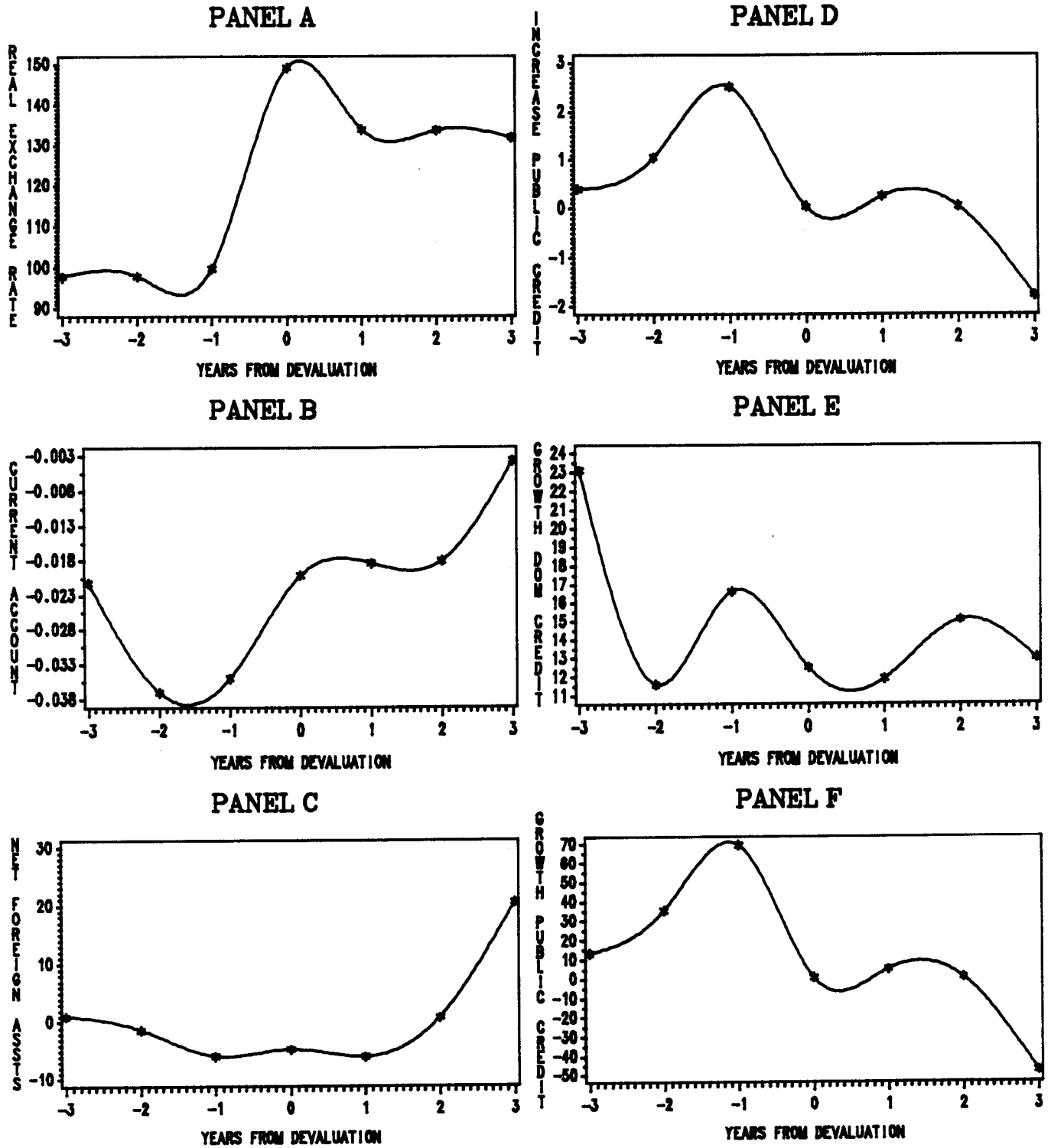
SOURCE: CONSTRUCTED FROM RAW DATA OBTAINED FROM THE I.F.S.

FIGURE 7.7 KENYA 1981



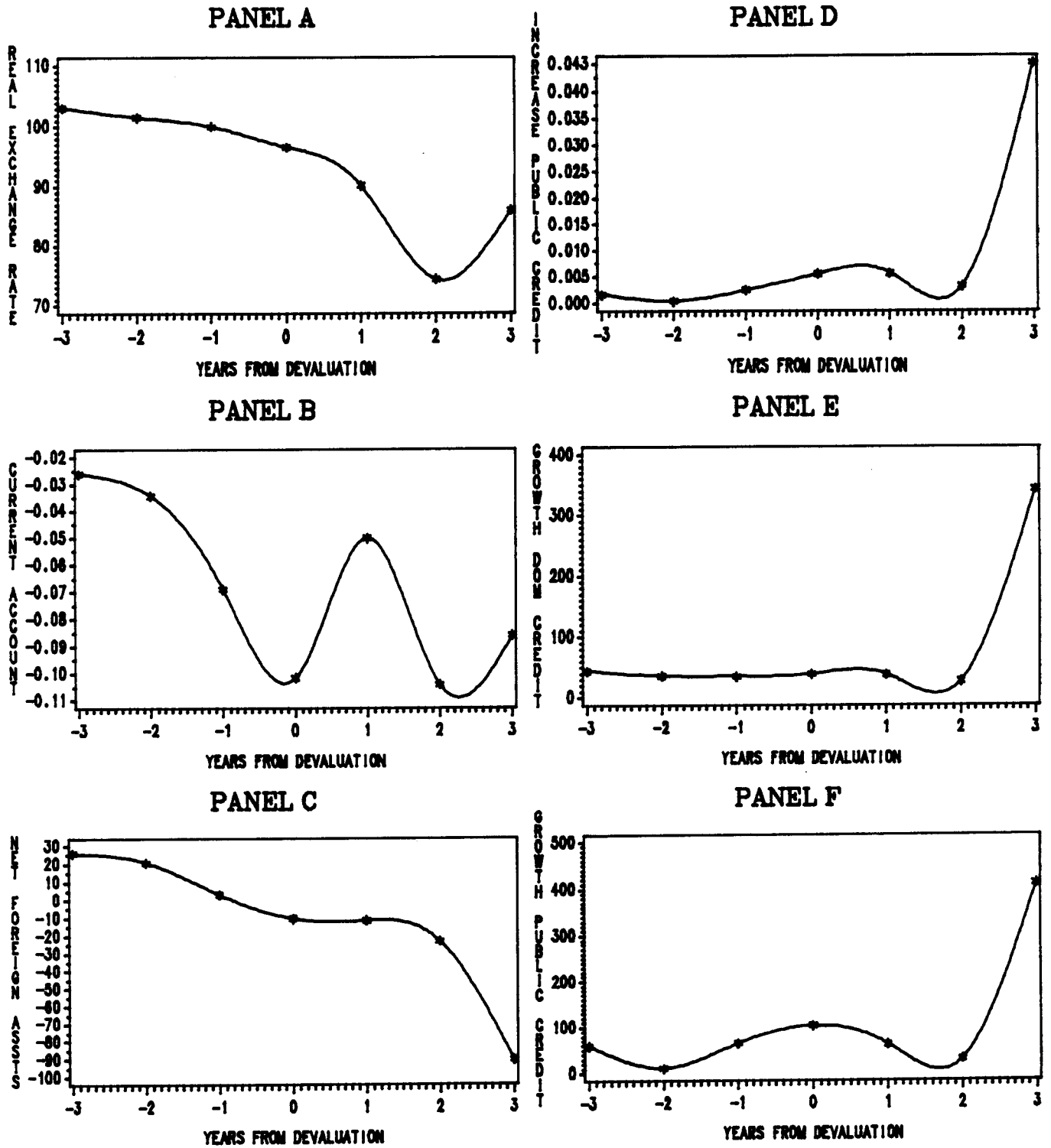
SOURCE: CONSTRUCTED FROM RAW DATA OBTAINED FROM THE I.F.S.

FIGURE 7.6
PHILIPPINES 1970



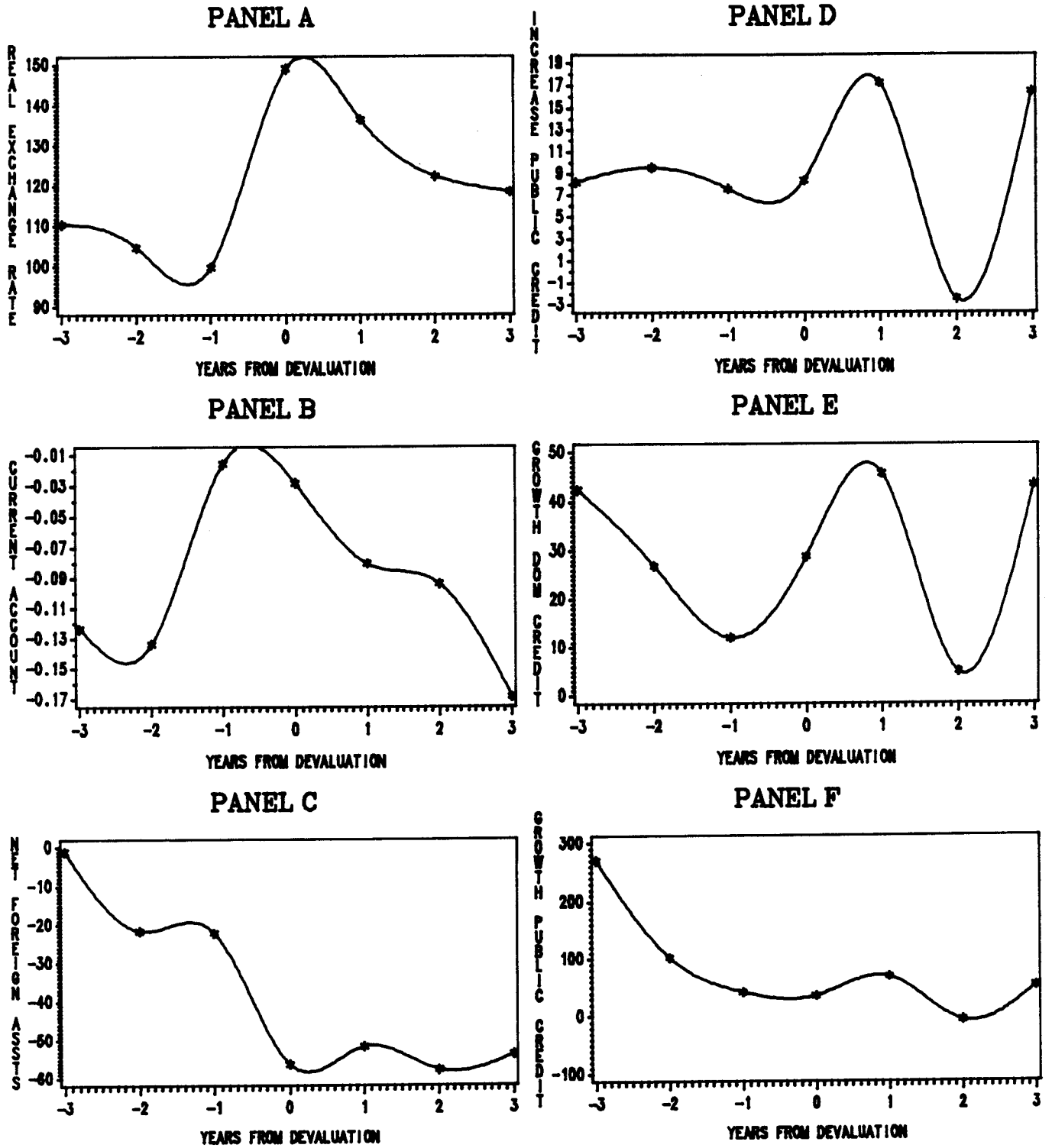
SOURCE: CONSTRUCTED FROM RAW DATA OBTAINED FROM THE I.F.S.

FIGURE 7.1
BOLIVIA 1979



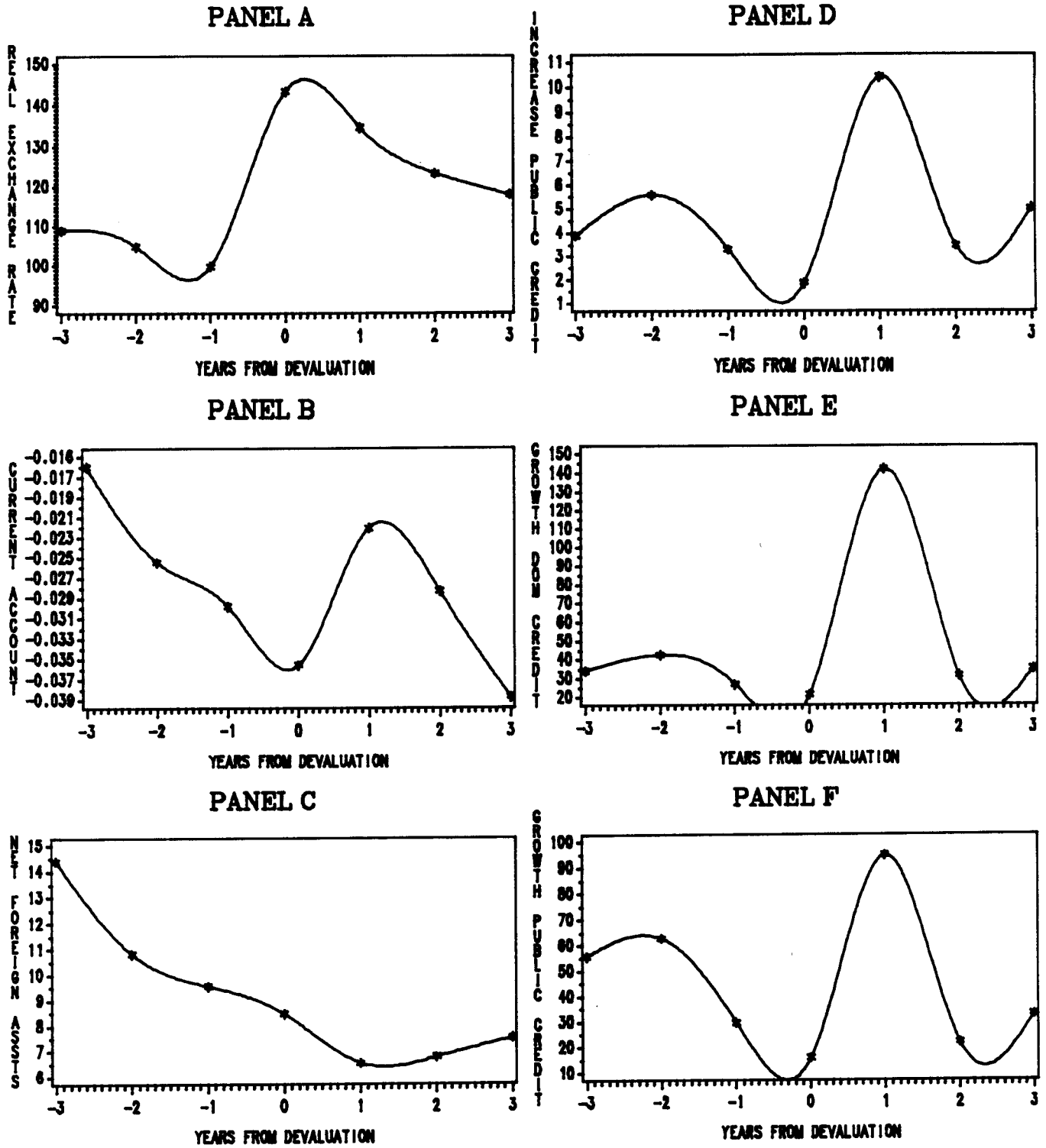
SOURCE: CONSTRUCTED FROM RAW DATA OBTAINED FROM THE I.F.S.

FIGURE 7.4 JAMAICA 1978



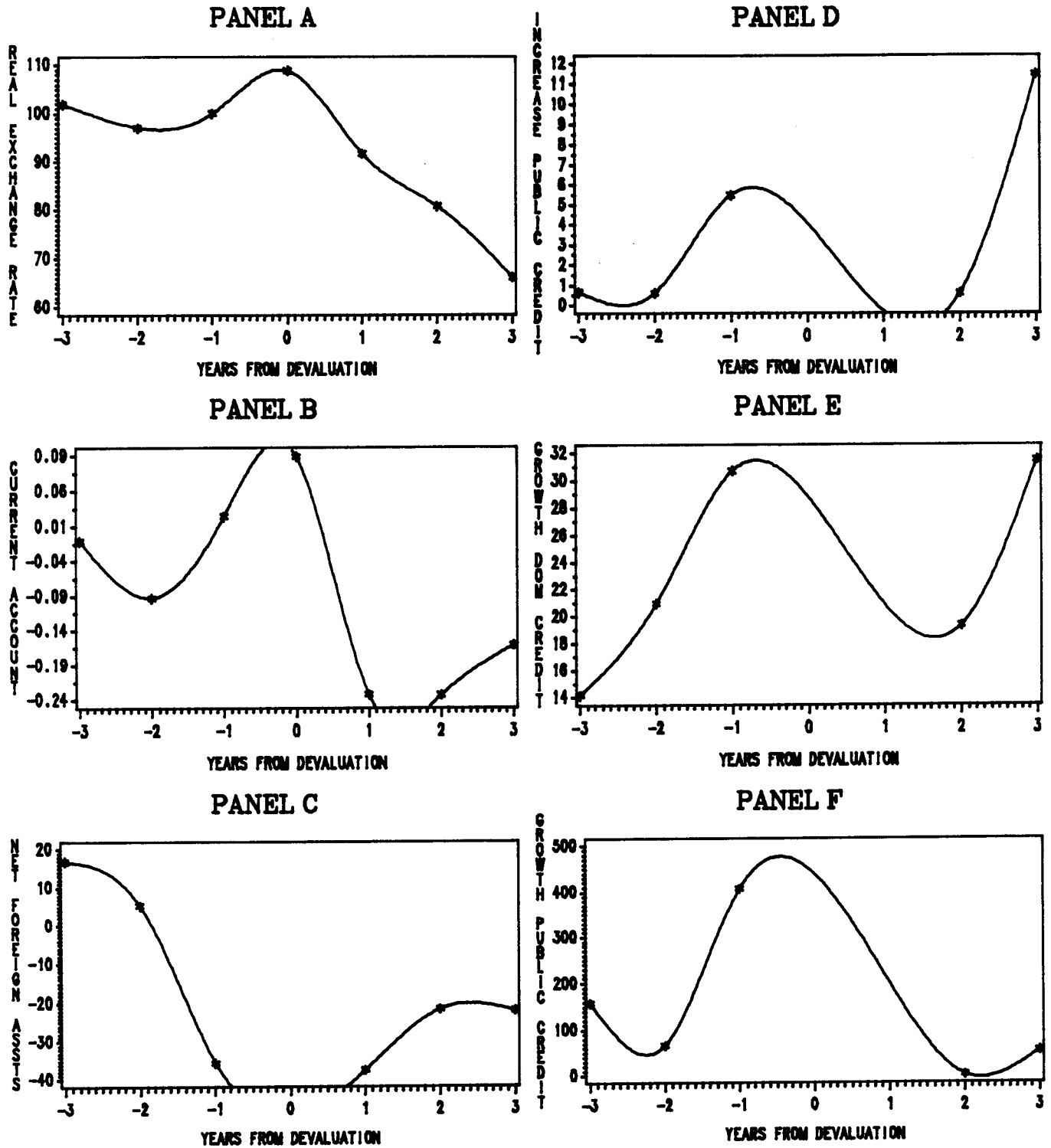
SOURCE: CONSTRUCTED FROM RAW DATA OBTAINED FROM THE I.F.S.

FIGURE 7.8 MEXICO 1976



SOURCE: CONSTRUCTED FROM RAW DATA OBTAINED FROM THE I.F.S.

FIGURE 7.9 NICARAGUA 1979



SOURCE: CONSTRUCTED FROM RAW DATA OBTAINED FROM THE I.F.S.

each panel are:

- Panel A: Real exchange rate index; in each case this index has a value of 100 the year before the crisis.
- Panel B: Ratio of current account to GNP.
- Panel C: Ratio of net foreign assets of the monetary system to money.
- Panel D: Increase in domestic credit to public sector as percentage of GNP. (In some cases this index has been multiplied by 100.)
- Panel E: Rate of growth of domestic credit.
- Panel F: Rate of growth of domestic credit to public sector.

Broadly speaking, the four examples of success are characterized by:

- (1) the RER index remained substantially above its predevaluation value;
- (2) the current account and/or net foreign assets ratios exhibited substantial positive responses following the devaluation, although in some cases such as Ecuador 1970 the current account ratio shows a pronounced J-curve behavior;
- (3) There is a reduction in the rate of growth of the different macroeconomic indicators. The four unsuccessful episodes look very different, Bolivia and Nicaragua providing the most extreme contrasts with the successful cases, because these countries show an almost continuous decline in their real exchange rates. In all four unsuccessful cases the right hand side panels clearly capture the fact that macro, and in particular fiscal, policies either continued to be inconsistent, or became even more inconsistent after the devaluation.

Footnotes

¹See the essays collected in Williamson (1983).

²A mistake sometimes made is to think of the RER as an instrument and of the balance of payments as a target. Instruments are exogenous variables that policymakers can manipulate. Of course, the RER is an endogenous variable. The correct way to think about this is to consider the RER as an intermediate target, which turns out to be an excellent indicator of the degree of effectiveness of the policy.

³These regressions included data on all stepwise devaluations except Bolivia 1979. Due to lack of data those equations where the fiscal deficit ratio was included were restricted to 18 episodes.

⁴The Appendix 6C to Chapter 6 provides a much more detailed analysis of the evolution of these policies.

⁵See Edwards (1984 and 1988) for a more detailed discussion on the role of credibility in trade liberalization reforms.

⁶If instead of the ratio of net foreign assets the stock of official international reserves is used, a somewhat different picture emerges. The reason for this is that in growing countries there is a natural tendency to hold more reserves as output and trade grow. On the demand for real international reserves in the developing countries and on the relation between reserves holdings and devaluation crises see Edwards (1983). Eaton and Gersovitz (1980) develop a model of a Central Bank where increases in foreign indebtedness can be used to accumulate more international reserves.

⁷Data on estimated capital flight not reported here due to space considerations show that in a large number of the devaluations that took place during the 1982 debt crisis capital flight continued during the period

immediately following the crisis. (These data are available from the author upon request.)

⁸Some of the critics of IMF policies have argued that the balance of payments improvement experienced after Fund sponsored programs that include a devaluation are due to the inflow of capital and not to an improvement of the current account. For this reason, it is particularly important to inquire how the current account has indeed reacted to devaluations.

⁹The following instruments were used: lagged growth; contemporaneous, lagged, and twice lagged log GCGDP; lagged, twice lagged, and three times lagged real exchange rates; nominal devaluation; lagged and twice lagged capital inflows; lagged and twice lagged real output; DEH; EXCRE, lagged and twice lagged EXCRE; contemporaneous, lagged, twice lagged money surprises. $\log \text{TOT}$, $\log \text{TOT}_{t-1}$, $\log \text{TOT}_{t-2}$, $\log \text{TOT}_{t-3}$; contemporaneous and lagged rate of growth of domestic credit; lagged and twice lagged parallel market premia; country dummies; time; contemporaneous, lagged and twice lagged domestic credit surprises.

¹⁰As with any attempt to classify individual observations in successful and unsuccessful groups, there is a certain degree of arbitrariness involved. However, by using these three variables we are focusing on the most immediate targets of devaluations and adjustment programs. In Chapter 8 we look in detail at the reaction of other variables including output, real wages and income distribution.

APPENDIX

TABLE 7A-1

Evolution of Multilateral Real Exchange Rate Index

After Devaluation

<u>Country</u>	<u>Year</u>	<u>Year Prior Devaluation</u>	<u>Year of Devaluation</u>	<u>1 Year After</u>	<u>2 Years After</u>	<u>3 Years After</u>
Argentina	1970	100	96.1	90.6	112.1	97.4
Bolivia	1972	100	140.7	138.1	115.1	116.9
Bolivia	1979	100	100.5	95.2	69.4	93.1
Colombia	1962	100	108.2	91.0	87.4	(120.6)*
Colombia	1965	100	138.0	120.3	(129.8)*	(133.8)*
Costa Rica	1974	100	115.9	99.7	109.3	115.6
Cyprus	1967	100	104.2	98.5	99.1	101.7
Ecuador	1961	100	117.8	111.9	108.0	106.4
Ecuador	1970	100	131.1	130.1	129.7	130.9
Egypt	1962	100	130.8	131.2	126.5	112.8
Egypt	1979	100	181.9	167.1	144.7	118.8
Guyana	1967	100	101.4	108.9	111.5	113.6
India	1966	100	142.8	128.6	128.6	133.7
Indonesia	1978	100	141.7	136.2	138.0	127.1
Israel	1962	100	137.8	133.5	130.8	123.7
Israel	1967	100	149.6	133.2	134.6	127.1
Israel	1971	100	95.9	90.3	89.5	90.8
Jamaica	1967	100	101.2	107.4	102.6	100.8
Jamaica	1978	100	139.8	142.1	125.7	119.2
Malta	1967	100	102.7	109.4	111.9	113.4
Nicaragua	1979	100	95.2	86.4	71.4	58.5
Pakistan	1972	100	236.0	193.7	187.1	167.2
Peru	1967	100	120.6	109.1	115.6	111.5
Philippines	1962	100	180.2	170.8	160.7	163.1
Philippines	1970	100	143.1	134.7	147.1	150.3
Sri Lanka	1967	100	103.6	112.7	109.4	108.6
Trinidad	1967	100	102.4	106.6	109.9	110.0

Table 7A-1 (cont.)

<u>Country</u>	<u>Year</u>	<u>Year Prior Devaluation</u>	<u>1 Year of Devaluation</u>	<u>1 Year After</u>	<u>2 Years After</u>	<u>3 Years After</u>
Venezuela	1964	100	131.8	132.7	134.7	135.1
Yugoslavia	1965	100	291.5	273.1	258.2	245.0
Bolivia	1982	100	134.1	87.8	65.7	n. a.
Chile	1982	100	135.9	135.0	149.9	189.8
Colombia	1967	100	107.8	111.3	109.1	116.8
Ecuador	1982	100	104.8	106.3	111.0	103.8
Kenya	1981	100	114.8	104.3	112.4	107.0
Korea	1980	100	117.7	107.6	105.5	113.4
Mexico	1976	100	148.6	135.2	130.8	125.1
Mexico	1982	100	149.9	152.5	127.5	145.4
Pakistan	1982	100	116.8	112.9	115.1	127.8
Peru	1975	100	94.4	105.4	139.1	161.4

* Indicates that a new devaluation took place that year.

Source: See text.

TABLE 7A-2

Parallel Markets Real Exchange Rate Indexes

In Devaluing Developing Countries

<u>Country</u>	<u>Year</u>	<u>-3 Yrs.</u>	<u>1 Year Before</u>	<u>Year of Dev.</u>	<u>1 Year After</u>	<u>2 Years After</u>	<u>3 Years After</u>
Argentina	1970	117.1	100	112.9	196.5	163.7	98.6
Bolivia	1972	79.2	100	108.2	86.2	69.6	66.2
Bolivia	1979	103.0	100	103.2	100.2	96.4	218.4
Colombia	1962	63.6	100	88.5	59.9	70.9	98.9
Colombia	1965	124.8	100	139.4	122.4	113.5	109.0
Costa Rica	1974	112.2	100	99.6	88.6	94.2	86.2
Ecuador	1961	88.1	100	99.8	115.5	92.5	91.3
Ecuador	1970	92.3	100	122.3	115.9	117.4	104.7
Egypt	1962	118.5	100	98.2	102.0	94.8	76.3
Egypt	1979	112.9	100	97.6	89.0	103.2	126.8
India	1966	94.0	100	101.0	91.7	92.0	105.7
Indonesia	1978	126.5	100	136.4	136.4	136.3	133.8
Israel	1962	77.3	100	67.6	63.6	58.6	57.5
Israel	1967	108.9	100	109.9	120.4	134.5	131.4
Israel	1971	91.6	100	107.2	97.4	119.6	109.8
Nicaragua	1979	82.2	100	166.5	115.2	163.5	169.6
Pakistan	1972	80.6	100	109.2	76.0	75.2	67.7
Peru	1967	122.7	100	125.8	130.1	130.0	171.7
Philippines	1962	88.4	100	76.8	71.3	66.8	70.5
Philippines	1970	73.0	100	108.7	98.1	104.3	96.6
Sri Lanka	1967	88.6	100	94.7	80.0	81.2	104.2
Venezuela	1964	104.5	100	96.9	98.3	98.9	99.4
Colombia	1967	81.5	100	92.6	88.9	90.2	108.7
Korea	1980	98.2	100	102.3	94.9	111.2	111.9
Mexico	1976	113.8	100	172.6	135.4	128.8	124.9
Peru	1975	114.8	100	99.1	95.8	103.0	110.8

Source: Constructed from data obtained from various issues of Picks
Currency Yearbook and International Financial Statistics.