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Adjustment Policies and Economic Growth in Developing Countries – Is Devaluation Contractionary?

By

Peter Nunnenkamp and **Rainer Schweickert**

I. The Failure of Economic Adjustment Programs

The principal objectives of economic adjustment programs, frequently supported by the International Monetary Fund, are to restore a viable balance-of-payments situation, to contain inflation, to remove distortions in relative prices, and thereby to enhance the overall growth prospects of Third World economies. However, recent reviews on the macroeconomic effects of IMF adjustment programs point to an only limited success in these respects. Khan [1988, p. I] summarizes the experiences of 67 developing countries with IMF programs during 1973–1986 as follows: "In the short run programs have led to an improvement in the current account, the balance of payments, and inflation, but this was accompanied by a decline in the growth rate. In the longer run the positive effects of progams on the external balance and inflation are strengthened, and the adverse growth effects reduced". The notion of *growth-oriented* adjustment appears to be an euphemism if the program costs in terms of low growth rates are basically "in line with the predictions of the theoretical models that underlie the design of Fund programs" [ibid., p. 26; for the model applied, see IMF, 1987].

It is thus not surprising that IMF adjustment programs have been increasingly attacked for doing little in improving the economic malaise of many developing countries, or even worsening their situation [e.g. Killick, 1984; Taylor, 1981]. However, it remains open to question which of the principal elements of IMF programs – domestic

credit restraint, public deficit reduction, and devaluation[1] – is to be blamed for the failure of growth-oriented adjustment. Most notably, it has to be clarified whether not only restrictive monetary and fiscal policies are growth reducing in the short run, but that devaluation is contractionary as well. Actually, exchange-rate policies are most controversially discussed in the literature. Since the publication of the influential paper by Krugman and Taylor [1978], the traditionally dominant view has been increasingly challenged, i.e., that the substitution effects engendered by a real devaluation are sufficiently strong to assure an expansionary net effect on output and employment.

The ongoing debate is based on a bewildering array of theoretical frameworks (for a recent overview, see Lizondo and Montiel [1988]). Interestingly enough, the theoretical debate has induced only few empirical studies on the growth effects of real devaluation in developing countries (for a notable exception, see Edwards [1985a]). Empirical research is all the more so required as many models leading to "'queer cases' from the view point of traditional theory" are characterized by "odd assumptions about 'substitutability' in production or consumption" [Lal, 1989, p. 291].[2]

This paper is intended to narrow the gap in empirical analysis. The remainder is organized as follows. Section II summarizes the state of empirical research on the role of exchange-rate policies in economic adjustment. Section III provides the framework for testing the economic-growth effects of real devaluation, and presents empirical results for the 1982–1987 period. Some policy conclusions are drawn in Section IV.

II. The Poor State of Empirical Research

Economic adjustment programs for developing countries generally focus on reducing domestic absorption through restrictive monetary and fiscal policies, as well as on expenditure switching (i.e.,

[1] Besides monetary, fiscal and exchange-rate policies, IMF programs frequently call for producer price increases, trade liberalization, and the removal of distortions in factor markets. The latter measures are not considered in the following since their economic rationale and growth-enhancing effects in the longer run are hardly to be disputed.

[2] Cline [1983] provides a compendium of strange assumptions and the evidence against them. Especially in Keynesian models relative prices play little role due to the typical assumption of little if any substitution in production and consumption. By contrast, changes in real exchange rates are ruled out in some monetarist models that take the law of one price as given and assume perfect substitution between tradables and nontradables.

increased production of tradables) through a devaluation of the domestic currency. According to traditional theory, a nominal devaluation results in higher output if there is unutilized capacity and the law of one price does not hold. However, the traditional view that devaluation-induced expenditure switching provides an important stimulus to economic growth has come under serious attack. Various theoretical arguments are advanced that point to contractionary demand and supply effects of devaluations [Lizondo and Montiel, 1988; Nunnenkamp and Schweickert, 1990]. Hence, the impact of a devaluation on real output remains ambiguous on analytical grounds.

In spite of the lively theoretical discussion on the growth effects of devaluation, the empirical evidence is still extremely sketchy. Moreover, most of the empirical investigations suffer from serious shortcomings. Many studies address the topic simply by portraying the economic-growth performance of developing countries after devaluations took place [see, e.g., Cooper, 1971; Krueger, 1978; Edwards, 1985b]. This "before-and-after" approach is subject to serious drawbacks so that the devaluation-induced growth effects cannot be assessed adequately. Most importantly, other factors that influence the growth performance are not controlled for. A decline in GDP growth may be due to external factors (e.g. worldwide recession or deteriorating terms of trade) or restrictive fiscal and monetary policies, rather than to devaluation [Balassa, 1987, pp. 209ff.]. Moreover, lower growth rates in the period when a devaluation takes place need not be the result of devaluation, but may indicate that devaluations are undertaken when output is below the trend.[3]

Other studies try to avoid these shortcomings by constructing simulation models [see, e.g., Gylfason and Risager, 1984; Gylfason and Radetzki, 1985; Branson, 1986; Taylor and Rosensweig, 1984]. Similar to the "before-and-after" approach, the results are mixed. This is not surprising since the outcome of the simulation models critically depends on the imputed parameter values. For example, a built-in bias towards contractionary devaluation may be simply due to "inadequate allowance for increases in exports and decreases in imports following a devaluation" [Balassa, 1987, p. 210], e.g. by assuming very low price elasticities for exports and low elasticities of substitution between labour and imported inputs.

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[3] This selectivity bias may also lead to a spurious positive correlation between devaluation and higher economic growth in the subsequent periods provided that growth would have recovered anyway [Connolly, 1983].

Principally, it appears to be more promising to subject a reduced form equation on the growth impact of devaluation to regression analysis. Only few studies have followed this avenue, of which Edwards [1985a; 1989] and Khan [1988] stand out. By definition this approach does not allow to establish whether there are different, i.e., contractionary *and* expansionary effects of devaluation working through various channels; the coefficient of the exchange-rate variable only captures the *net* growth impact of devaluation. But this approach does not require arbitrary assumptions on crucially important parameter values. Moreover, it is easily possible to control for the growth impact of external factors, such as changes in the terms of trade, and of internal policy measures other than currency realignments.

In their pooled time-series cross-country analyses for 1965–1980 (Edwards)[4] and 1973–1986 (Khan) both authors account for policy variables other than exchange-rate policies as well as for external terms-of-trade shocks.[5] Different results are achieved for the exchange-rate variable. It turns out to be completely insignificant for the fairly large sample analysed by Khan. By contrast, the coefficient of the contemporaneous real exchange rate is significantly negative in Edwards' analysis of twelve developing economies, while the coefficient of the real exchange-rate term with a one-period lag is significantly positive.[6] Edwards [1985a, p. 12] concludes: "These results provide statistical support to the view that in the short run devaluations have a contractionary effect on aggregate output. ... Also, these findings indicate that this short-term contractionary effect is later reversed, with after one year the devaluation having an expansionary influence on output. Moreover, according to these results the contemporaneous and lagged effects of the (real) devaluation cancel themselves".[7]

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[4] Recently, Edwards has extended the period to 1965–1984 [Edwards, 1989, pp. 324ff.]. In the following, we refer to the earlier results if not otherwise indicated.

[5] Strictly speaking, the real exchange rate is not a policy variable. However, nominal devaluations of developing countries are likely to result in real devaluations in the short run.

[6] In contrast to our approach to be presented in Section III.1, an increase in the exchange-rate term represents a real devaluation in the definition of Edwards.

[7] For the extended period of 1965–1984, the coefficients of the lagged exchange-rate variable remain insignificant, suggesting that the short-run negative effect of devaluation on real GDP is not reverted as time passes [Edwards, 1989, pp. 327ff.].

Notwithstanding the considerable progress in terms of adequate methodology, the analyses by Edwards and Khan may be challenged on several grounds:

- Problems of multicollinearity are not discussed in either of the two studies, although they may lead to seriously biased coefficient values.[8]
- The negative correlation between changes in the exchange rate and real output in the year of the devaluation may result from a selectivity bias if devaluations are undertaken in periods of low growth.[9]
- The growth effects of devaluation can be expected to differ between various groups of developing countries. The large sample of 67 countries considered by Khan consists of an extremely heterogeneous set of developing economies. A different growth impact of devaluation between various country groups, e.g. agricultural exporters and exporters of manufactures, may cancel out and result in the insignificant coefficient of the exchange-rate variable.[10] By contrast, the results presented by Edwards are likely to be biased, since the group of twelve countries mainly consists of fairly advanced economies with a diversified manufactured export structure.
- The findings for the 1960s and 1970s cannot necessarily be transferred to the 1980s. The rationing of external finance especially for highly indebted countries presumably has altered the impact of exchange-rate changes on real economic activity to a significant extent.

All in all, the above discussion highlights the need to improve the current state of empirical research on the growth impact of devaluation. In the following, a reduced form equation is estimated. To avoid seriously biased results, conceptual improvements are presented in the

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[8] In Khan's analysis, the specific elements of IMF adjustment programs and the program dummy enter the regressions simultaneously. Consequently, the dummy variable may capture the devaluation impact and thus render the coefficient of the exchange-rate variable insignificant. Edwards' results may be distorted due to the simultaneous inclusion of current and lagged values for the same variables (money surprises, terms of trade, and exchange rates) which may be highly correlated. A high partial correlation is also likely between the terms-of-trade variable and the exchange-rate variable which is defined as the relative price of tradables to non-tradables.

[9] The distortions which may arise from the selectivity bias are reduced in Khan's analysis by introducing a lagged growth variable on the right-hand side of the equation.

[10] Such structural divergencies cannot be adequately controlled for by introducing country-specific (shift) dummies which only allow for inter-country differences in the dependent growth variable.

subsequent section. Most notably, it is hypothesized that the direction, the degree and the lag structure of the growth impact of devaluation are not the same for different developing country groups, but depend on various structural characteristics of Third World economies.

III. The Impact of Real Exchange Rates on Economic Growth

1. The Test Format

The basic equation to be estimated below is of the form:

$$Y = a + bR + cEGDP + dUOG + eTOT + fDY. \quad (1)$$

The dependent variable Y represents annual real growth of GDP per capita, as published in UNCTAD [1988]. R denotes annual changes in the real effective exchange rate. The calculation is based on IMF data on nominal exchange rates (partner countries' currencies per unit of domestic currencies of sample countries) and consumer prices [IMF, b].[11] A negative R denotes a real devaluation. So, a positive sign of the coefficient b is to be expected if devaluation is contractionary.

The remaining variables are introduced to control for other economic policy measures (EGDP, UOG), the growth impact of external shocks (TOT), and pre-devaluation differences in economic growth (DY). The definition of these variables is as follows: EGDP represents the percentage share of government expenditure in GDP, as given in IMF [b]. If restrictive fiscal policies affect economic growth negatively in the short run, the coefficient c should be positive.[12] UOG indicates monetary surprise shocks. The unanticipated annual change in money supply is calculated in two steps (data are from IMF [b]): (*i*) The expected development of money supply is derived by assuming adaptive monetary expectations; using quarterly data for the 1977–1987 period, the regression run for each sample country relates current monetary growth of broad money (M2) to the values of this variable

[11] Trade weights refer to the shares in world trade and are calculated from IMF [a; b]; for the formula applied and its economic justification, see Fischer and Spinanger [1986, pp. 83 ff.].

[12] Alternatively, the fiscal balance relative to GDP (DGDP) is considered as an indicator of the stance of fiscal policies in the sample countries. These results are not reported here in detail. The coefficient values of the other variables are hardly affected by this modification. Moreover, replacing EGDP by DGDP gives rise to some multicollinearity problems.

lagged by one, two and three periods. (*ii*) The unanticipated change in money supply is then given by the difference between the actual and the predicted growth of monetary aggregates.[13] If unanticipated money expansion results in short-term positive growth effects, the coefficient *d* should have a positive sign.

In addition to the growth impact of policy adjustments, we account for the growth effects of factors that are beyond the control of the sample countries. TOT indicates terms-of-trade shocks.[14] The balance-of-payments impact in period t of changes in the terms of trade is given by the following formula:

$$TOT_t = \{[(p_t^M - p_{t-1}^M)\,MV_t] - [(p_t^X - p_{t-1}^X)\,XV_t]\}/(X_t + M_t), \tag{2}$$

where p^M and p^X denote import and export prices, respectively (proxied by unit value indices as published in UNCTAD [1988]); MV and XV represent imports and exports in constant prices;[15] and M and X are imports and exports in current prices [IMF, b]. Adverse terms-of-trade shocks are indicated by positive values of TOT. Hence, the coefficient *e* in (1) should be negative if adverse external shocks are growth reducing.

Finally, DY represents a lagged growth variable. It is calculated as the three-period moving average of the values of the dependent variable Y lagged by one, two and three periods.

Equation (1) is estimated for 48 developing countries for which the required data are available. Pooled time-series cross-country regressions are run for the 1982–1987 period by applying ordinary-least-square techniques. The focus is on the recent past since the role of exchange-rate policies has probably become more important since the international debt crisis erupted in 1982, especially for those countries to which foreign finance is no longer available.

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[13] In additional calculations, the fiscal balance relative to the base money with a one-period lag is included as explaining variable in the regressions on the expected development of monetary aggregates. However, we concentrate on UOG in the following. The modification does not change significantly the results presented in the subsequent section. But the number of observations would be considerably reduced because data for many sample countries are lacking if the fiscal-balance term were included.

[14] Alternatively, we calculate the sum of terms-of-trade shocks and interest-rate shocks (IR). The balance-of-payments impact of the latter is given by: $IR_t = [(i_t - i_{t-1})\,D_{t-1}]/(X_t + M_t)$, where i denotes the average interest rate on external debt (proxied by the percentage share of interest payments in the debt disbursed and outstanding in $t-1$), and D denotes external debt outstanding and disbursed. Again, the results are hardly affected by this modification so that the results are not reported due to space considerations.

[15] Current import and export values are deflated by the respective unit value indices.

Regressions are run for various sub-groups of the overall sample. This is because we expect the growth impact of devaluations to differ between developing countries which reveal different structural characteristics in terms of income level, predominant exports, openness to world markets, exchange-rate volatility, inflation, and foreign debt status.[16] Due to space considerations, only major results are presented in detail in the subsequent section (for additional results, see Nunnenkamp and Schweickert [1990]). The correlation coefficients for the explaining variables show that multicollinearity problems do not exist (Table 1).

In addition to (1) which uses current values of all explaining variables, pooled time-series cross-country calculations are performed where values of the explaining variables with a one- *or* two-period lag enter the regression.[17]

2. Empirical Results

The results for all 48 sample countries clearly point to the limitations of the reduced form equation that underlies the estimates (Table 2). Even by cross-country standards, the overall explanatory power is fairly low.[18] This may be partly attributed to the fairly heterogeneous set of countries included. Moreover, we do not aim at a complete specification of the growth equation because the focus is on short-term adjustment policies. An extended specification would have required, for example, to include the investment ratio and world-market performance as important determinants of economic growth in the longer run.

Not surprisingly, the lagged growth variable (DY) is positively correlated with current economic growth. The negative sign of the external-shock variable (TOT) was also to be expected, though it is significant only in the one-period lag variant. Fiscal policies, as reflected in changes of the share of government expenditure in GDP

[16] Details of the classification of sample countries are available from the authors upon request; see also Nunnenkamp and Schweickert [1990, Appendix Table 1].

[17] Current and lagged values of the explaining variables do not enter the regressions simultaneously because this gives rise to multicollinearity problems. The lagged equations are given in the subsequent tables only if at least one of the policy variables is significant at the 10 per cent level or better.

[18] This contrasts sharply with the extremely high R^2s achieved by Edwards which are consistently close to unity [1985a; 1989]. Probably, the latter result is simply due to the inclusion of country-specific trend variables. These are highly significant because the period underlying the estimates is fairly long (1965–1980 and 1965–1984, respectively).

Table 1 – *Pooled Time-Series Cross-Country Regressions: Summary Statistics*[a]

	All 48 developing countries	13 low income countries	22 countries with lower-middle income	9 countries with upper-middle income	9 exporters of manufactures	11 agricultural exporters	6 countries with diversified export base
	Mean 1982–1987 (standard deviation in parentheses)						
Y	0.4	0.3	−0.1	0.7	3.2	−0.8	0.3
	(4.7)	(3.8)	(4.7)	(4.6)	(3.4)	(3.9)	(4.2)
R	−4.5	−7.7	−3.0	−4.5	−4.0	−2.4	−1.8
	(28.9)	(48.1)	(15.9)	(18.8)	(8.1)	(17.6)	(11.3)
EGDP	24.8	21.8	26.1	23.2	26.3	23.5	22.3
	(11.4)	(8.1)	(12.0)	(10.4)	(22.9)	(8.7)	(10.6)
TOT	1.1	0.4	0.5	1.9	−0.5	−0.1	−0.0
	(6.2)	(5.2)	(4.9)	(7.2)	(3.5)	(4.3)	(4.1)
UOG	1.0	−1.2	1.1	4.3	1.3	0.4	0.7
	(22.1)	(12.1)	(12.3)	(44.3)	(11.0)	(14.8)	(10.9)
DY	0.1	0.2	0.4	−0.2	2.6	−1.3	0.8
	(4.2)	(3.4)	(4.1)	(3.6)	(2.4)	(3.4)	(2.6)
	Partial correlation coefficients between the explaining variables						
R/EGDP	0.11	0.12	0.16	0.13	−0.20	0.01	−0.10
R/TOT	−0.02	0.07	−0.09	−0.13	0.23	0.04	−0.22
R/UOG	0.05	0.03	−0.13	0.24	−0.19	−0.24	0.20
R/DY	0.09	0.27	0.00	0.02	0.10	−0.17	0.41
EGDP/TOT	0.22	0.11	0.17	0.08	0.06	0.28	0.26
EGDP/UOG	−0.07	−0.06	−0.03	−0.11	0.47	−0.09	−0.09
EGDP/DY	−0.01	0.07	0.29	0.04	−0.51	0.24	0.37
TOT/UOG	−0.10	−0.12	−0.00	−0.20	−0.03	−0.06	0.17
TOT/DY	−0.06	0.06	0.16	−0.27	−0.09	0.13	0.10
UOG/DY	−0.12	0.05	−0.22	−0.27	−0.35	−0.23	0.15

[a] For the definition of variables and data sources, see the text. None of the correlation coefficients is significant at the 5 per cent level of confidence.

(EGDP), remain completely insignificant; while unanticipated money creation (UOG) shows a small expansionary effect on economic growth in the current period. Most notably, the hypothesis of contractionary devaluation is unambiguously rejected. The significantly negative coefficients of R point to expansionary, though not very strong effects of devaluations in the period when they were undertaken and in the two subsequent periods.

The latter result supports our supposition that the contractionary effects of contemporaneous devaluation found by Edwards [1985a;

Table 2 – *Pooled Time-Series Cross-Country Regression Results for 48 Developing Countries*[a], *1982–1987*

Lag	Const.	R	EGDP	TOT	UOG	DY	R^2 ($\bar{R}^2$)	F[b]
0	−0.22	−0.020*	0.020	−0.04	0.02*	0.38***	0.13	6.53
	(−0.31)	(−1.92)	(0.74)	(−0.73)	(1.71)	(5.34)	(0.11)	(218)
1	0.30	−0.018*	0.004	−0.08*	0.00	0.30***	0.10	5.89
	(0.46)	(−1.96)	(0.17)	(−1.78)	(0.20)	(4.59)	(0.09)	(252)
2	0.15	−0.022**	−0.002	−0.00	0.01	0.31***	0.09	5.46
	(0.24)	(−2.18)	(−0.09)	(−0.07)	(0.71)	(4.50)	(0.08)	(266)

[a] For the definition of variables, data sources, and calculation procedures, see the text. t-values are in parentheses. *** denotes significance at the 1 per cent level of confidence; ** that at the 5 per cent level; * that at the 10 per cent level (two-tailed t-test). – [b] Degrees of freedom are in parentheses.

1989] cannot be generalized. Edwards' sample is heavily biased towards fairly advanced developing countries with a diversified and manufactured export base, while low income exporters of raw materials are hardly taken into account. Hence, we differentiate the overall sample of 48 countries with regard to predominant exports and the level of economic development in the next step. In this way, we provide a more rigorous test of the hypothesis that contractionary effects of devaluation, if any, are restricted to specific country groups.

The classification of different income groups is based on World Bank data on per-capita income. The regression results support our proposition that the degree and lag structure of exchange-rate effects on economic growth differs between various country groups (Table 3). The mean of annual devaluations in the 1982–1987 period was highest for low income countries, with the standard deviation of R being exceptionally high (Table 1). Uncertainty created by volatile exchange rates may explain why the negative coefficient of R is relatively small.[19] But in contrast to countries with higher income, the expansionary effects of devaluation materialized in the same period when devaluations were undertaken.[20] Also for the more advanced

[19] In a cross-country analysis for 42 developing countries, high fluctuations in the real effective exchange rate turned out as an important detriment to economic growth in 1982–1987. The standard deviation of the residuals calculated from trend estimates of R for 1978–1987 exhibited a highly significant negative growth impact [Nunnenkamp and Schweickert, 1990].

[20] For low income countries, the coefficient of R remains completely insignificant in the lagged equations. The same applies to the other policy variables.

Table 3 – *Regression Results for Developing Countries of Different Income Level*[a], *1982–1987*

Lag	Const.	R	EGDP	TOT	UOG	DY	R^2 ($\bar{R}^2$)	F[b]
				13 low income countries				
0	0.51	−0.033***	−0.027	−0.02	−0.02	0.56***	0.32	5.25
	(0.41)	(−3.60)	(−0.51)	(−0.27)	(−0.70)	(4.36)	(0.26)	(57)
				22 countries with lower-middle income				
0	−2.10*	0.015	0.077*	−0.22**	0.05	0.37***	0.20	4.61
	(−1.90)	(0.53)	(1.96)	(−2.45)	(1.34)	(3.22)	(0.16)	(92)
1	−1.59	−0.035	0.067*	−0.24***	0.02	0.22**	0.18	4.89
	(−1.66)	(−1.47)	(1.94)	(−3.24)	(0.71)	(2.19)	(0.15)	(108)
2	−1.36	−0.096***	0.048	0.01	0.00	0.22**	0.16	4.33
	(−1.41)	(−3.38)	(1.39)	(0.13)	(0.10)	(2.12)	(0.12)	(115)
				9 countries with upper-middle income				
0	2.02	0.024	−0.051	0.01	0.02	0.49**	0.16	1.43
	(1.15)	(0.63)	(−0.76)	(0.08)	(0.90)	(2.29)	(0.05)	(38)
1	1.79	−0.075**	−0.060	−0.02	0.01	0.42**	0.19	2.20
	(1.19)	(−2.20)	(−1.03)	(−0.28)	(0.61)	(2.31)	(0.11)	(46)
2	2.09	−0.074**	−0.084	−0.06	0.02	0.31	0.19	2.29
	(1.30)	(−2.12)	(−1.33)	(−0.64)	(1.05)	(1.61)	(0.11)	(48)

[a] Classification based on World Bank data on per-capita income [World Bank, 1989, Appendix Table 1]. For the definition of variables, data sources, and calculation procedures, see the text. t-values are in parentheses. *** denotes significance at the 1 per cent level of confidence; ** that at the 5 per cent level; and * that at the 10 per cent level (two-tailed t-test). – [b] Degrees of freedom are in parentheses.

developing countries, there is no evidence pointing to contractionary devaluation; the positive coefficients of the contemporaneous exchange-rate variable are insignificant. But the expansionary effects were somewhat delayed, especially in the lower-middle income group.

In all three income groups, current growth was strongly influenced by the growth performance in the preceding periods. The effects of external shocks as well as monetary and fiscal policies were negligible, except for the lower-middle income group. It is interesting to note that the latter countries experienced the steepest reduction in economic growth in 1982–1987 (Table 1). At the same time, the average degree of devaluation was relatively small, and the share of government expenditure in GDP exceptionally high. So, this country group faced relatively strong fiscal adjustment needs. Not surprisingly, fiscal adjustment had short-term costs in terms of lower economic growth. According to the results of Table 3 it would be grossly misleading to blame exchange-rate policies for this temporary decline in growth (to which also adverse terms-of-trade shocks contributed significantly).

The differences between specific country groups become even more pronounced if the sample economies are classified according to their predominant exports. Table 4 reveals that not only the degree and the lag structure of exchange-rate effects on economic growth differed in the 1980s, but also their direction.[21] The most remarkable differences are to be observed if exporters of manufactures and agricultural exporters are compared.[22] Most notably, the results presented by Edwards in his earlier paper [1985a] are confirmed for the group of exporters of manufactures in Table 4. This was to be expected since Edwards' sample consists mainly of developing countries for which manufactured exports figured prominently. The contractionary effects of devaluation indicated by the contemporaneous exchange-rate variable are matched by similarly strong expansionary effects in the subsequent period.

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[21] This also applies to the growth effects of monetary and fiscal policies. Money surprises (UOG) had a significant impact in countries whose exports were concentrated on manufactures, while fiscal policies (EGDP) remain completely insignificant. For agricultural exporters money surprises were negligible on average, as indicated by the extremely low mean of UOG in Table 1, while EGDP had a strong impact on economic growth. Both UOG and EGDP show the expected positive – and highly significant – coefficient values for countries with a diversified export base.

[22] For countries with a diversified export base exchange-rate policies were of minor importance. According to Table 1, the average degree of devaluation in 1982–1987 was considerably smaller than in the other country groups.

Table 4 – *Regression Results for Groups of Developing Countries with a Different Export Base*[a], *1982–1987*

Lag	Const.	R	EGDP	TOT	UOG	DY	R^2 ($\bar{R}^2$)	F[b]
				9 exporters of manufactures				
0	2.29**	0.148***	−0.021	−0.24*	0.11**	0.72***	0.48	6.96
	(2.29)	(2.77)	(−0.96)	(−1.98)	(2.68)	(3.67)	(0.42)	(37)
1	0.79	−0.128**	−0.015	0.08	0.10**	0.89***	0.44	6.56
	(0.83)	(−2.66)	(−0.71)	(0.70)	(2.66)	(4.60)	(0.37)	(42)
2	1.47	−0.012	−0.006	0.03	0.01	0.63***	0.19	2.13
	(1.36)	(−0.24)	(−0.27)	(0.32)	(0.16)	(2.88)	(0.10)	(45)
				11 agricultural exporters				
0	−5.21***	−0.066**	0.177***	−0.22*	−0.01	−0.07	0.24	3.09
	(−3.38)	(−2.25)	(2.96)	(−1.87)	(−0.16)	(−0.42)	(0.16)	(49)
1	−3.24**	−0.019	0.124**	−0.30***	−0.00	−0.00	0.22	3.25
	(−2.48)	(−0.75)	(2.37)	(−3.19)	(−0.05)	(−0.01)	(0.15)	(57)
2	−3.58**	−0.037	0.139**	−0.12	0.00	−0.02	0.14	1.84
	(−2.53)	(−1.11)	(2.44)	(−1.32)	(0.05)	(−0.15)	(0.06)	(57)
				6 countries with diversified export base				
0	−4.75**	0.036	0.239***	−0.15	0.17**	−0.45	0.40	2.90
	(−2.75)	(0.49)	(3.15)	(−0.83)	(2.56)	(−1.36)	(0.26)	(22)

[a] Classified according to IMF information on predominant exports [IMF, 1989, pp. 118 ff.]. For the definition of variables, data sources, and calculation procedures, see the text. t-values are in parentheses. *** denotes significance at the 1 per cent level of confidence; ** that at the 5 per cent level; and * that at the 10 per cent level (two-tailed t-test). – [b] Degrees of freedom are in parentheses.

Arguably the degree of capacity utilization is relatively high in countries with a favourable performance in exporting manufactured goods. Hence, expansionary effects of real devaluation on the production of import substitutes and exportables are delayed and the contractionary effect of rising import prices dominates the growth performance in the short run. Furthermore, international price linkages may be relatively strong for manufactured goods. Consequently, devaluation results in price effects in the first place, while positive supply effects are reduced. Notwithstanding delayed and reduced output effects in the tradables sector, however, real devaluation is shown to be neutral in the medium run.[23]

The regression runs for agricultural exporters show a considerably different pattern of coefficient values.[24] Contractionary effects of devaluation are not to be observed; devaluation was rather growth enhancing in the short run. This indicates that the widespread export pessimism of agricultural exporters is not justified.[25] Adjustment costs in terms of lower growth are mainly to be attributed to temporary recessionary effects of restrictive fiscal policies.

Devaluation cannot be blamed for the poor growth performance of developing countries with foreign debt problems either.[26] In none of our estimations the exchange-rate variable turns out to be positive. Actually, expansionary effects of devaluation were stronger in developing countries that encountered debt problems in the 1980s than in countries without reschedulings. But especially for the 14 most heavily

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[23] Edwards [1985a] reached the same conclusion by analysing the t-statistic of estimated parameter values. But he included contemporaneous and lagged values of the real exchange rate in one regression. As argued above, multicollinearity between these variables is to be expected. Consequently, the t-test cannot be relied upon in testing the significance of the exchange-rate parameters.

[24] The results presented in Table 4 are based on data for 11 out of the 14 agricultural exporters included in our sample. Argentina, Ghana and Nicaragua are excluded in order to reduce the extremely high volatility in real exchange rates observed for the group of 14 countries. However, the major results remain largely unaffected by this modification. Not surprisingly, the absolute size of the coefficient of R declines for the extended sample (-0.027), as the contractionary effects of high exchange-rate volatility are captured by R. But the negative coefficient of R is still highly significant.

[25] On the role of exchange-rate policies for the recovery of the agricultural sector in developing countries, see e.g. Bond [1983]; Gulhati et al. [1986]; and Chhibber [1988].

[26] The detailed regression results for developing countries with and without debt problems, with different degrees of exchange-rate fluctuations, inflation rates, and openness towards world markets are not presented here; the following discussion refers to Nunnenkamp and Schweickert [1990, Tables 5–7].

indebted countries these effects materialized with considerable delay only. From the negative coefficient of the lagged growth variable (DY) it may be concluded that devaluations were undertaken in this group when economic growth was below the trend. With only one exception, short-term fiscal and monetary policies had no significant impact on economic growth of the problem debtors. This indicates that short-term adjustment measures are of little help to restore economic growth in these countries, unless such measures are an integrated part of comprehensive and consistent structural reform packages.

A major aim of such structural reform packages must be to reduce uncertainty of producers and investors, and thereby strengthen the supply responsiveness to changes in relative prices. Uncertainty is for example created by high exchange-rate volatility and high inflation. The relevance of structural differences in these respects in determining the growth impact of devaluation is confirmed by the regression results. High exchange-rate fluctuations reduced the growth-enhancing effects of devaluation considerably. Notwithstanding extremely volatile real exchange rates, a weak expansionary effect of devaluations is to be observed in the period when they were undertaken. However, the coefficients of R remain completely insignificant in the growth equations with a one- or two-period lag for the 15 countries with high exchange-rate fluctuations. By contrast, countries with less volatile exchange-rate policies benefited from a by far more pronounced rise in economic growth in the two periods following a devaluation. A similar picture emerges when the sample countries are classified according to the average degree of inflation in 1982–1987. The coefficient of R is insignificant in five out of six equations run for two country groups with annual inflation rates of 8–30 per cent and more than 30 per cent, respectively.[27] On the other hand, a fairly strong expansionary impact of devaluation is estimated for countries with inflation rates of less than 8 per cent; the coefficient of R amounts to −0.133 (significant at the 5 per cent level) in the growth equation with a one-period lag.

The revision of external trade policies would be another important element of structural reform packages in problem-ridden developing

[27] The exception is the significantly negative coefficient of R for the 12 countries with high inflation in the growth equation with a two-period lag. But the coefficient value remains fairly small in absolute terms (−0.024).

countries.[28] Openness towards world markets may improve the chances that changes in relative prices are transmitted into supply responses. Consequently, the growth effects of devaluation are expected to depend on the overall development approach of the countries in question. This was indeed the case to some extent. Though somewhat delayed, the effects of devaluation on economic growth were relatively strong for moderately open developing countries. The growth impact of exchange-rate policies was small and limited to the current period in closed economies. However, negative growth effects – as hypothesized by the extensive literature on contractionary devaluation – did not materialize in either of the country groups considered.

IV. Summary and Conclusions

Various channels have been identified in the literature through which devaluations may cause contractionary effects on economic growth in developing countries. The bewildering array of theoretical frameworks on contractionary devaluation has increasingly challenged the view that the devaluation-induced substitution effects on both the demand and supply side are sufficiently strong to assure an expansionary net effect on aggregate production and employment. The theoretical debate has added to the widespread export pessimism of Third World economies and to their reluctance to use exchange-rate policies as an expenditure switching device in economic adjustment programs. This pessimism has also been fed by empirical studies that found devaluations to be associated with lower growth and pointed to the failure of IMF adjustment progams in restoring economic growth.

In this paper, however, it is argued that the pessimism about the growth effects of real devaluation is not justified. Many arguments in the ongoing theoretical debate on contractionary devaluation are based on questionable assumptions. In some models, growth-enhancing substitution effects of a devaluation are simply assumed away. The empirical evidence is still extremely sketchy. Especially the "before-and-after" approach applied in many studies suffers from serious shortcomings. Typically, not the growth impact of devaluation per se

[28] It is no longer to be disputed that a world-market oriented development approach is better suited to improve the growth performance of Third World economies than persistent and comprehensive import substitution policies. For the substantial body of research on this issue, see e.g. Krueger [1978]; Donges and Müller-Ohlsen [1978]; Tyler [1981]; and Balassa [1984].

is assessed, but rather the combined effects of external factors and of adjustment packages which also include restrictive macroeconomic policies.

To overcome major conceptual weaknesses in previous empirical research, we have subjected a reduced form equation on the growth impact of devaluation to regression analysis. First, this approach does not require arbitrary assumptions on crucially important parameter values. Second, it is possible to control for external factors and internal policy measures other than currency realignments. Third, the pooled time-series cross-country analysis for 1982–1987 allows to differentiate between various country groups, and thereby to test the hypothesis that the growth impact of real devaluation depends on structural characteristics of the economies considered.

The hypothesis of contractionary devaluation is rejected in the pooled regressions run for the overall sample of 48 countries. The group-specific estimates support the proposition that the direction, the degree and the lag structure of the growth effects of devaluation depend on structural characteristics of the economies:

- Contractionary effects of devaluation are only observed for exporters of manufactures in the period when devaluations took place. This negative growth impact was matched by similarly strong expansionary effects in the subsequent period.
- Devaluation was growth enhancing in the short run for agricultural exporters. This indicates that the widespread pessimism about agricultural supply responsiveness to changes in relative prices is not justified.
- Devaluation cannot be blamed for the poor growth performance of developing countries with foreign debt problems either. But especially for the most heavily indebted countries the expansionary effects of devaluation were delayed.

Therefore, the decline in economic growth experienced by many developing countries in the 1980s cannot be attributed to real devaluation. It was rather due to restrictive monetary and fiscal policies, and in some instances also to adverse world market developments. Especially fiscal adjustment had short-term costs in terms of lower economic growth in several country groups, as was to be expected. Developing countries would thus be ill-advised to stick to overvalued domestic currencies. The adjustment costs are likely to increase unless the revision of fiscal and monetary policies is complemented by real devaluation.

However, the estimates indicate as well that short-term adjustment measures are not sufficient to restore economic growth in today's problem-ridden developing countries. The expansionary effects of real devaluation remain weak for countries with high inflation and extremely volatile exchange-rate policies. Hence, structural reform packages should aim at reducing uncertainty of producers and investors about the course of monetary and exchange-rate policies. This would help to strengthen the supply responsiveness to changes in relative prices. Similarly, openness towards world markets is likely to improve the prospects that devaluation-induced changes in relative prices are transmitted into supply responses. A critical review of external trade policies should thus be a major element of structural reform programs. Especially for many developing countries with severe foreign debt problems it is crucially important to overcome persistent and comprehensive import substitution policies, and thereby improve the chances for expansionary devaluation.

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Zusammenfassung: Anpassungspolitik und wirtschaftliches Wachstum in Entwicklungsländern: Wirken Abwertungen kontraktiv? – Der Auffassung, daß abwertungsbedingte Substitutionseffekte ausreichend stark sind, um eine Ausweitung der Produktion zu gewährleisten, wird vielfach entgegengetreten. Eine verwirrende Vielzahl theoretischer Modelle verweist auf kontraktive Auswirkungen einer realen Abwertung. Empirische Analysen von Wechselkurseffekten auf das gesamtwirtschaftliche Wachstum fehlen jedoch weitgehend. Die vorliegende gepoolte Länderquerschnittsuntersuchung für den Zeitraum 1982–1987 soll dazu beitragen, diese Lücke zu schließen. Die Ergebnisse der Regressionsschätzungen widersprechen dem weitverbreiteten Pessimismus über die Wachstumseffekte realer Abwertungen. Die Schätzungen für verschiedene Ländergruppen zeigen allerdings, daß die Richtung, das Ausmaß und die zeitliche Abfolge der Wirkungen von den charakteristischen Strukturmerkmalen der untersuchten Länder abhängen. Insbesondere die Exportstruktur erweist sich als wichtig.

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Résumé: Les politiques d'ajustement et la croissance économique dans les pays en voie de développement: Est-ce que la dévaluation empêche la croissance? – La série déconcertante des théories qui posent qu'une dévaluation empêche la croissance doute de plus en plus de l'opinion que les effets de substitution causés par une dévaluation sont suffisamment forts pour augmenter la production macroéconomique. Avec cette étude on a l'intention de diminuer le trou frappant concernant la recherche empirique sur des effets d'une dévaluation. Les résultats de cette analyse de regression faite à travers des pays pour la période de 1982 à 1987 s'opposent au pessimisme général en ce qui concerne la répercussion d'une dévaluation réelle sur la croissance économique des pays en voie de développement. Les estimations pour des groupes de pays spécifiques indiquent que la direction, le degré et la structure temporelle des effets de croissance dépendent des caractéristiques structurelles des économies, principalement des exportations prépondérantes.

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Resumen: Políticas de ajuste y crecimiento de países en desarrollo: ¿puede una devaluación ser contractiva? – El impresionante número de marcos teóricos que tratan la devaluación contractiva está cuestionando seriamente la noción de que los efectos substitutivos inducidos por la devaluación son suficientemente fuertes como para garantizar un impacto netamente expansivo sobre el producto. La intención de este trabajo es llenar el vacío que existe en el studio empírico de los efectos de una devaluación. Los resultados del análisis de regresión de una muestra de varios países para el período 1982–1987 refutan el pesimismo generalizado sobre el impacto de una devaluación del tipo de cambio real sobre el crecimiento. Sin embargo, las estimaciones para ciertos grupos de países indican que el signo, el nivel y la estructura temporal de los impactos sobre el crecimiento dependen de las características estructurales, ante todo de las exportaciones más importantes de las economías estudiadas.