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CENTER DISCUSSION PAPER NO. 72

CURRENCY DEVALUATION IN DEVELOPING COUNTRIES:

A CROSS-SECTIONAL ASSESSMENT*

Richard N. Cooper

July, 1969

Note: Center Discussion Papers are preliminary materials circulated to stimulate discussion and critical comment. References in publications to Discussion Papers should be cleared with the author to protect the tentative character of these papers.

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Introduction

By wide agreement, many less developed countries have "over-valued" currencies. Yet most countries are reluctant to devalue their currencies even when the signs of over-valuation are unmistakable. A variety of objections are raised to devaluation, but most of them reduce to three basic ones: 1) devaluation will not in fact improve the devaluing country's payments position; 2) devaluation might work if given a chance, but it will unleash forces in the economy that will eventually undercut its benefits and those of other economic policies; and 3) even if devaluation works it will be politically disastrous to those officials who are responsible for undertaking it.

Despite these sources of resistance, currency devaluation has frequently taken place under the pressure of circumstances. These devaluations provide an opportunity to evaluate, at least crudely, the consequences of devaluation and to assess the extent to which the foregoing fears are justified.

† This study generalizes from the experience of 24 devaluations, involving 19 different countries. It includes most of the currency devaluations during the period 1959-1966. Those devaluations during this period that are excluded involve countries in unusual circumstances, such as Laos and Vietnam, Venezuela was also excluded because it is a country with a large trade surplus, and therefore untypical of less developed countries. Canada, on the other hand, was included in the study because of its large trade deficit and regular importation of capital, making it similar in that respect to many less developed countries. Iceland and Spain, like many less developed countries, both had multiple currency practices. A few cases of devaluation in the mid-fifties were also included, to enlarge the sample. Availability of data also influenced the selection.

The intent of the study was to examine discrete changes in exchange rates -- a "once-for-all" change in exchange rate from one level to another, such as is called for under the present international rules governing international payments. This consideration ruled out those cases, such as Chile and Uruguay, where the effective exchange rate has depreciated almost continuously over long periods of time. It might also seem to rule out Argentina and Brazil, where hardly a year has gone by without some change in the effective exchange rate. But these two countries did each have one devaluation that was so far-reaching in character and extensive in amount that they seemed to warrant inclusion here. Canada and Peru had floating exchange rates; but in each case the rate depreciated from one relatively well-defined level to another in the course of a year, so it was thought worthwhile to include them.

The study is subject to three important limitations. First, economic data for less developed countries, while steadily improving, are still very incomplete for many countries and are often of poor quality. Second, the data are inevitably after the fact, and they reflect many economic changes other than the devaluation under examination. Much analytical work is required to convert the actual observations into "other things being equal" observations. Only a few crude adjustments to take account of other factors are made here, partly because of inadequacies in the data that would be required to undertake sophisticated adjustments, partly because of the conceptual difficulties involved in such adjustments. Finally, the 24 cases of devaluation were not studied in any depth. Those well versed in the construction of the statistics from these countries may cringe at the use to which they are put

here; time was not available to explore their construction in the detail required for sophisticated judgments concerning how they can and how they cannot be used legitimately. This study is therefore merely a start on a more thorough cross-sectional investigation of currency devaluations. It is a preliminary report and a tentative agenda for further work, and it is hoped that the generalizations made here will stimulate such work, of which surprisingly little has been undertaken to date (see the bibliography attached).

What follows will be divided into six sections, the first is concerned with the nature of devaluation. It is followed by sections on the effects of devaluation on the balance of payments, on the terms of trade, on the level of economic activity, on prices and wages, and on the political fate of the governments immediately responsible.

I. Nominal vs. Effective Devaluation

Under the rules of the International Monetary Fund, to which all countries considered here belong, each member country must declare a fixed "par value" for its currency, in terms of gold or the U.S. dollar, which is to be applicable to all current transactions with foreigners. A currency devaluation involves a specified reduction in the gold or dollar value of the devaluing country's currency.

Most currency devaluations are not this straightforward. For a variety of reasons, many less developed countries do not apply a single, well-defined exchange rate to all current account transactions with foreigners. Rather, they have a system of multiple rates, the rates used for a particular transaction depending on the type of transaction and even sometimes on the foreign

country involved in the transaction. Moreover, a country with a technically unified exchange rate may use import tariffs, export taxes or subsidies, and direct controls to achieve much the same effects as with multiple rates. Many exchange rate adjustments therefore are piecemeal, with the government engaging in salami tactics to achieve an effect thought to be too dangerous to be taken all at once.¹ The cases considered here do involve a major adjustment, however, and therefore exclude some of the more devious exchange adjustments that are nevertheless cumulatively significant.

Where the de facto exchange system has become highly complicated, usually under the pressure of accumulating balance-of-payments difficulties, devaluation is often used as an occasion for tidying the system up as well as for changing the par value of the currency. Thus currency devaluations take a wide variety of forms, and they cannot be handled satisfactorily in any simple, catchall fashion. However, it is possible to distinguish between two broad types of policy change accompanying devaluation: exchange reform and import liberalization.

Exchange reform involves the elimination or virtual elimination of multiple exchange rates and the movement to a unitary rate or something close to it, whether fixed or flexible. The qualification "virtual" is introduced to allow for those cases in which the country retains a separate, less favorable rate for traditional exports of primary products, substituting for an export tax with the purpose either of preventing a deterioration in the country's terms of trade or, more often, of capturing the windfall profits or rents accruing to producers of traditional products whose supply is thought to be inelastic in the short run.

Import liberalization involves the reduction of quantitative restrictions on the flow of imports: enlargement or elimination of import quotas, relaxation of licensing requirements, and often the reduction or elimination of advance deposits and other impediments to imports. Import liberalization shades from a little to a lot. Both exchange reform and import liberalization can be spread over many months or even years, and this practice has been especially common for import liberalization. In addition, whether or not exchange reform or import liberalization occur, devaluation may be accompanied by a stabilization program, involving restrictive monetary and fiscal action designed to reduce the rate of inflation and help bring external payments directly into balance.

In ten of the 24 cases considered here devaluation was associated with extensive exchange reform and in ten cases it was accompanied by moderate to substantial liberalization of imports; both moves complicate the task of assessing the effects of devaluation. Where a change in par value of a currency was accompanied by a unification of multiple exchange rates or by changes in import tariffs and export subsidies or taxes, the change in the effective exchanges rates -- the amount of local currency that purchasers must actually pay for a dollar's worth of imports and the amount of local currency that an exporter actually receives for a dollar's worth of exports -- might be substantially less than the nominal change in the exchange rate and may differ between exports and imports.

Table 1 lists the devaluations examined in this study, the month of the devaluation, the nominal devaluation, and the effective devaluation as it affected merchandise exports and imports, calculated in a manner described in

Appendix A. Where the formal change in par value took place well after a major exchange reform, the "nominal" change in exchange rate and the indicated date apply to the principal import rate rather than to the par value. In many instances the entries in the table (including some of the dates) should be regarded as approximations rather than exact figures. The effective devaluations, in particular, often cover a period extending some months before or after the month of the nominal devaluation. Moreover, the figures in Table 1 may overstate the effective devaluation for several reasons. Where one of the incentives to export is an entitlement to import "linked" to export performance, devaluation of the rate applicable to imports, by reducing the profits on importing, will also reduce the incentive to export. Second, tariffs on items important in the cost of living may be temporarily reduced to limit politically sensitive price increases, and such reductions may not be fully reflected in the figures here. Finally, the effective devaluations exclude the effects of removing import quotas.

Several features of the results in Table 1 stand out. First, effective devaluation was usually less than the nominal devaluation, and often substantially less. The reverse, however, is apparent in a few cases. Second, more often than not effective devaluation for imports was larger than that for exports. This fact arises from two causes. a) Countries that are heavy exporters of foodstuffs and raw materials often imposed an export tax or a less favorable exchange rate on such products when the currency was devalued. b) Countries have increasingly resorted to subsidies for their non-traditional exports when it becomes clear that the exchange rate is so over-valued as to discourage such exports. The subsidies are removed on realignment of the

Table 1
Nominal and Effective Currency Devaluation

Country	Time of Devaluation (percent change in dollars per unit of local currency)	<u>Nominal</u> <u>Devaluation</u> ^a	<u>Effective Devaluation</u>	
			Exports	Imports
Argentina	Jan. 1959	66	63	61
Brazil	Sep. 1964	66 ^b	65 ^b	61 ^b
Canada	June 1961-May 1962	5	5	10 ^c
Colombia	Nov. 1962	26	13	23
Colombia	Sep. 1965	33	6	25
Costa Rica	Sep. 1961	15	14	6
Ecuador	July 1961	17	10	16
Greece	Apr. 1953	50	31	41
Iceland	Feb. 1960	57	54	41
Iceland	Aug. 1961	12	12 ^d	11 ^d
India	June 1966	37	n.a.	27 ^c
Israel	Feb. 1962	40	12 ^c	26 ^c
Korea	Feb. 1960	25	29	34
Korea	Feb. 1961	50	35	36
Korea	May 1964	49	44	50
Mexico	Apr. 1954	31	28	31
Morocco	Oct. 1959	17	17	12 ^c
Pakistan	July 1955	30	28	28
Peru	Jan. 1958-Apr. 1959	31	31	31
Philippines	Jan. 1962	40	14	16
Philippines	Nov. 1965	10	10	0
Spain	July 1959	30	24 ^d	26 ^d
Tunisia	Sep. 1964	20	20	17
Turkey	Aug. 1958	56	39 ^d	

a Parity or principal import rate

b During calendar year 1964

c Includes known changes in import duties and export subsidies

d Effective devaluation calculated for goods and services; the remainder for merchandise only

exchange rate, often to be re-introduced at a later date. Import tariffs, on the other hand, are more often regarded as permanent rather than temporary features of the landscape, and while some special import surcharges are removed at the time of devaluation, the basic tariff level typically remains.

II. Devaluation and the Balance of Payments

Devaluation is normally undertaken to improve the balance of payments, and a devaluation may therefore be judged successful to the extent that it has led to an improvement in the balance of payments. The principal effects will normally be on trade flows: by increasing the profitability of export sales relative to local sales, devaluation should stimulate exports; and by making imports more expensive relative to local goods and services, devaluation should discourage imports. The balance on goods and services should improve. But a devaluation may have no observed effect on trade yet still be judged highly successful if it permits numerous controls and subsidies, required at the old exchange rate to prevent a far worse balance than that actually observed to be eliminated. Moreover, a successful devaluation might actually worsen the balance on goods and services if, in addition to permitting elimination of undesirable balance-of-payments controls, it induced a larger net inflow of capital from abroad. Such an increased net inflow might result from an inflow of private foreign investment to take advantage of the improved competitive position of the country, or, lately, from increased inflows of foreign aid for which devaluation and exchange reform were preconditions.

Table 2 records the balance of payments before and after devaluation. The first column indicates the balance of goods and services in the year preceding devaluation. Since few less developed countries compile balance-of-payments data on a quarterly or even semi-annual basis, the "preceding year" is the calendar year preceding the year of devaluation when the devaluation took place before May of that year; otherwise it is the year of devaluation, except for Korea (1964) and India. Those two countries compile semi-annual data, and the record here runs from July through June for those two cases.² The change recorded is between the preceding year and the year immediately following it. The monetary balance recorded for the two successive years in the last two columns represents the change in net international reserves, defined to include short-term official borrowing abroad and transactions with the International Monetary Fund as well as changes in gross reserves. All entries are measured in terms of dollars, the foreign currency, as is appropriate in assessing a country's balance of payments position; but in a few cases these had to be computed from data reported in local currency.

In fifteen cases the balance on goods and services improved in the year following devaluation. The balance remains negative in most of these cases; that is not surprising, nor does it indicate that devaluation failed to correct the balance-of-payments position. These countries are all normal importers of capital (although in the year preceding devaluation four countries in fact had current account surpluses, all for rather special reasons), and can be expected to run deficits on goods and services. The point of devaluation is to reduce this deficit to the point at which it can be readily financed by capital imports, not to eliminate it.

Table 2

Balance of Payments
(\$ million)

Country	Time of Devaluation	<u>Balance on</u> <u>Goods and Services</u>		<u>Change in</u> <u>Capital^a</u>	<u>Monetary Balance</u>	
		Previous Year	Change	<u>Inflow</u>	Preceding Year	Following Year
Argentina	Jan., 1959	-256	270	63	-214	119
Brazil	, 1964	39	159	221	78	458
Canada	1961-1962	-859	117	-283	293	127
Colombia	Nov., 1962	-176	30	-14	-44	-29
Colombia	Sept., 1965	-24	-253	157	57	-39
Costa Rica	Sept., 1961	-20	-2	20	-11	7
Ecuador	July, 1961	-28	18	8	-14	12
Greece	Apr., 1953	-136	60	-23	19	56
Iceland	Feb., 1960	-13	2	12	-9	6
Iceland	Aug., 1961	5	3	5	12	20
India	June, 1966	-1313	-35	54	-29	-10
Israel	Feb., 1962	-450	-33	122	75	164
Korea	Feb., 1960	-228	-34	31	4	1
Korea	Feb., 1961	-262	64	-18	1	47
Korea	May, 1964	-320	112	-149	7	-30
Mexico	Apr., 1954	-122	98	-106	-32	-40
Morocco	Oct., 1959	129	-94	119	40	65
Pakistan	July, 1955	-21	-21	32	7	18
Peru	1958	-117	78	-47	-13	18
Philippines	Jan., 1962	-161	99	27	-90	36
Philippines	Nov., 1965	38	46	-60	-15	-29
Spain	July, 1959	-109	404	-5	66	465
Tunisia	Sept., 1964	-124	-56	68	-15	-3
Turkey	Aug., 1958	-86	-31	-44	73	-2

^aIncluding errors and omissions and unilateral transfers

Note: Columns (2) + (3) = (5) - (4), except for rounding errors

Source: International Financial Statistics and Pakistan Economic Journal,
(March 1957)

In sixteen cases there was an improvement in the net reserve position (monetary balance is positive) in the year following devaluation, and in seventeen cases the monetary balance showed an improvement over the year preceding devaluation. Twelve of these latter cases also involved an improvement in the balance on goods and services. Put another way, in six of the nine cases in which the current account worsened, this was more than compensated for by an increase in net capital inflows. In summary, then, 21 of the 24 cases showed either an improvement in the current balance or an improvement in the monetary balance, or both. Only Colombia (1965), Korea (1960), and Turkey experienced a worsening in both the current and the monetary balances. The Korean position showed substantial improvement after a second devaluation the following year, however, while Colombia experienced an export boom (excluding coffee) in 1965, our year of devaluation, following a devaluation applicable to non-traditional exports in late 1964. Turkey's exports performed very well following devaluation (see Table 4 below), but an extensive liberalization program led to a sharp increase in imports.

On the face of it, this evidence seems to scotch the view that, in general, devaluation will not work. Positions did improve following devaluation. On the other hand, the improvements are not so overwhelming as to allay concern for any particular country, for in three or seven or nine cases, depending on the criterion used, devaluation did not "work" in the following year. The proportion is substantial enough to give any Minister of Finance pause.

Before turning to a more analytical interpretation of the effects of devaluation, one further bit of ex post evidence may be mentioned. The broad coverage of Table 2 is confined (in most cases) to calendar years. For merchandise trade alone the time period of observation can be geared more accurately to the time of devaluation. Other things being equal, a devaluation should reduce the volume and foreign-currency value of imports, and should increase the volume of exports. Whether it increases or reduces the foreign-currency value of exports depends upon domestic supply conditions and world demand conditions regarding the devaluing country's exports combined with fairly elastic supply will lead to a reduction in the value of exports; otherwise the value should increase.

Table 3 sets out trade performance over the four quarters preceding devaluation and over the four quarters following the quarter preceding devaluation. The entries are percentage changes in the volume of exports and imports, or in the dollar value when volume indexes were not available. It can be seen there that in 14 cases imports actually did fall following devaluation, and in several other cases they rose negligibly; exports rose in all but five cases. These developments accord with theoretical expectations for an economy that is not growing and offer further evidence that devaluation had a corrective influence, although in several cases speculation on the prospect of devaluation may also have influenced the results in the indicated directions.

This kind of post hoc ergo propter hoc analysis involves serious risk of misinterpretation, however, for trade flows were clearly influenced by

Table 3

Percentage Changes in Volume of Merchandise Trade Four Quarters

Before and After Devaluation

Country	Time of Devaluation	Terminal Quarter	Exports		Imports	
			Before	After	Before	After
Argentina	Jan. 1959	IV	25	-15	2	-2
Brazil	Sept. 1964	II	-9	41	-7 ^a	-20 ^a
Canada	1961-1962	I	6	6	9	-6
Colombia	Nov. 1962	III	11	0	-39	16
Colombia	Sept. 1965	II	0	1	-14	23
Costa Rica	Sept. 1961	II	21	8	0	-4
Ecuador	July 1961	II	-17	17	1 ^a	-26 ^a
Greece	Apr. 1953	I	-13	0	-23	-1
Iceland	Feb. 1960	IV	-2	13	19	-8
Iceland	Aug. 1961	II	-5 ^a	40 ^a	-17	43
India	June 1966	II	-3	-5	-6	-1
Israel	Feb. 1962	IV	9	24	24	-2
Korea	Feb. 1960	IV	-30 ^a	187 ^a	70 ^c	-7 ^c
Korea	Feb. 1961	IV	187 ^a	1 ^a	-7 ^c	28 ^c
Korea	May 1964	I	24 ^a	38 ^a	-10 ^c	-7 ^c
Mexico	Apr. 1954	I	3	14	17 ^a	0 ^a
Morocco	Oct. 1959	III	n.a.	12	n.a.	30
Pakistan	July 1955	II	8	-31	n.a.	n.a.
Peru	1958 ^b		10	11	-15 ^a	-18 ^a
Philippines	Jan. 1962	IV	-8	28	16	-8
Philippines	Nov. 1965	III	-12	15	14	2
Spain	July 1959	II	-10 ^a	50 ^a	-4	-10
Tunisia	Sept. 1964	II	n.a.	n.a.	n.a.	n.a.
Turkey	Aug. 1958	II	-47 ^a	62 ^a	3 ^a	5 ^a

a Value (in foreign currency)

b Before: 1957 to 1958; after: 1958 to 1959

c Dollar value, excluding aid-financed imports

Source: International Financial Statistics

factors other than currency devaluation. In particular, it would be inappropriate to credit devaluation with increases in export earnings that merely reflect growth in world demand and that would have taken place without the devaluation. On the other hand, imports may be assumed to rise with domestic income (and with relaxation of import control policies), and it would be equally inappropriate to conclude that devaluation had failed on the basis of income-induced increases in imports or increases resulting from import liberalization.

Table 4 offers a crude attempt to allow for the effects on exports of the growth in world markets and for the effects on imports of changes in world prices (presumed beyond influence of the devaluing countries) and of changes in domestic demand. Computed exports indicate what each country's merchandise exports would have been in the calendar year following devaluation if it had maintained the same share of the world market (by 3-digit SITC commodity group) that it had in the year preceding devaluation.³ Computed imports are derived from imports in the calendar year preceding devaluation by applying an income elasticity of demand⁴ for imports to the actual growth in each country's real income in the year following devaluation and, where data permitted, by adjusting for changes in foreign prices of imports.

Actual exports in the year following devaluation exceeded computed exports in 14 instances, and imports were lower than computed imports in 16 instances. On the assumption that national income did not decline in Costa Rica in the year following devaluation, the trade balance improved over what it would have been otherwise in 17 of the 24 cases, a somewhat better showing than that in Column 2 of Table 2.⁵

Table 4
 Merchandise Exports and Imports
 Year Before and After Devaluation
 Compared with Computed Values for Year Following
 (\$ million)

Country	Exports			Imports			Trade Balance	
	Before	Computed	After Actual	Before	Computed	After Actual	Computed	Actual
Argentina	994	1088	1009	1233	1078 ^a	933	10	76
Brazil	1430	1411	1595	1263	1304	1096	107	499
Canada	5811	6231	5926	6193	6741 ^a	6404	-510	-478
Colombia (1962)	423	494	446	540	559 ^a	506	-65	-60
Colombia (1965)	537	631	510	454	484 ^a	674	147	-164
Costa Rica	84	86	93	107	n.a.	113	n.a.	-20
Ecuador	127	125	143	94	100 ^a	85	25	58
Greece	119	131	132	346	398	296	-267	-164
Iceland (1960)	65	74	67	95	104 ^a	88	-30	-21
Iceland (1961)	71	83	84	75	84 ^a	89	-1	-5
India	1687	1862	1603	2955	3014	2740	-1152	-1137
Israel	245	258	279	592	643 ^a	628	-385	-349
Korea(1960)	19	22	31	304	313	344	-291	-313
Korea(1961)	31	30	41	344	362	316	-332	-275
Korea(1964)	87	96	119	515	556 ^a	396	-460	-277
Mexico	521	545	549	808	897	799	-352	-250
Morocco	329	369	354	326	334	413	35	-59
Pakistan	400	398	340	290	315	417	83	-77
Peru	281	278	312	334	347	294	-69	18
Philippines	530	551	562	677	720 ^a	654	-169	-92
Philippines (1962)	794	872	821	894	944 ^a	957	-72	-136
Spain (1965)	501	529	725	795	832 ^a	721	-303	4
Tunisia	127	125	120	244	252	245	-127	-125
Turkey	247	246	355	315	336	469	-90	-114

^aCorrected for change in import prices

This calculation makes no allowance for the stimulus to imports from import liberalization. Of the 24 devaluations, ten involved a moderate to extensive degree of import liberalization within the following twelve months. Curiously, however, in eight of the ten cases (Table 5) the volume of imports declined in the four quarters following devaluation. Import liberalization was delayed three to twelve months in Iceland (1960), Israel, Korea (1964), Spain, and Turkey, suggesting that the authorities waited to see how the devaluation was going before they dared to relax controls on imports. In Korea, for example, imports rose sharply after the import liberalization of early 1965. Except in Colombia, however, it appears that the immediate movement of imports was dominated by the devaluation or by depressions in economic activity rather than by relaxation of controls over imports.

Table 5

Instances of Import Liberalization

Liberalizing Country	Volume of Imports (percent change in four quarters following quarter preceding devaluation)	Change in Balance on Goods and Services (\$ million)
Argentina	-2	270
Colombia (1965)	23	-253
Greece	-1	60
Iceland (1960)	-8	2
India	-1	-35
Israel	-2	-33
Korea (1964)	-7	110
Philippines (1962)	-8	99
Spain	-10	404
Turkey	5	-31

Source: Tables 3 and 2

It should be emphasized here that devaluation cannot normally be expected to have its principal, let alone its sole effects in the following year. Expansion of exports and substitution for imports will often require new investment, or at a minimum reorganization of existing productive capacity (e.g. changing the pattern of land use). For manufactured goods, new exports may also require the development of foreign markets. All these adjustments take time. What we have focussed on here are therefore merely the impact effects of devaluation. These are the effects, however, that are usually of greatest interest and concern to those politically responsible for decisions to devalue.

III. Devaluation and the Terms of Trade

An argument sometimes advanced against currency devaluation is that it will turn the terms of trade against the devaluing country, thereby benefiting the rest of the world at its expense. A worsened terms of trade is not a necessary consequence of devaluation, however, and indeed for a country that is sufficiently small relative both to its foreign sources of supply and to its export markets, the terms of trade will be beyond its influence, hence unchanged by devaluation. All of the countries considered here are "small" in this sense relative to their sources of imports, but not necessarily to their export markets: Brazil's coffee prices may influence world coffee prices, Argentina's beef prices may influence world beef prices, and so on. Under these circumstances devaluation will generally worsen the devaluing country's terms of trade by lowering the (foreign currency) prices received for its exports, the extent of the worsening depending not only on the price

elasticity of foreign demand for the country's export products but also on the devaluing country's elasticity of supply of exports -- the higher the former and the lower the latter, the less likely will there be a deterioration in the terms of trade.⁶

Table 6 indicates the movement in foreign trade prices during the year following 17 devaluations. The terms of trade deteriorated in seven of these cases, and improved in nine. Many of the price movements, however, were unrelated to the devaluations; it can be assumed that changes in dollar import prices and increases in dollar export prices were due to other factors. Dollar export prices declined in seven instances, and these declines might have been brought about by the devaluations; but in only three cases -- Canada, India, and Spain -- did the decline in export prices exceed 2 percent, and in the latter two cases the decline was small relative to the devaluation. The general impression conveyed by these data is that the impact of devaluation on the terms of trade is negligible for most less developed countries. This result may, of course, have been achieved through actions designed to prevent a deterioration, such as the imposition of export taxes. Several countries here did impose taxes on their principal exports of primary products. But these taxes were imposed primarily to tax away the windfall profits that otherwise would have accrued to the producers, often landlords. This is obviously the case for countries (e.g. Costa Rica) so small in the world market that demand for their exports is highly elastic, where the terms of trade cannot deteriorate; in other cases domestic supply of traditional products (e.g. coffee, beef) is inelastic in the short run, so devaluation would tend to raise domestic prices for these products rather than lower foreign prices. Greece imposed export taxes on cotton, olive oil, and rice explicitly to hold down the cost of living.

Table 6

Change in Foreign Trade Prices and Terms of Trade
in Four Quarters Following Devaluation
(percentage in dollar prices)

Country	Export Prices	Import Prices	Terms of Trade
Argentina	11	-4	16
Brazil	4	3	1
Canada	-3	-1	-2
Colombia (1962)	-1	-5	4
Colombia (1965)	1	-4	5
Costa Rica	--	-2	2
Ecuador	-1	n.a.	n.a.
Greece	n.a.	n.a.	-2
Iceland (1960)	2	3 ^a	-1
Iceland (1961)	4 ^a	-6 ^a	10 ^a
India	-3	n.a.	n.a.
Israel	--	-2	2
Korea (1964)	6	5	1
Morocco	-1 ^a	-3 ^a	2 ^a
Philippines (1962)	4	5	-1
Philippines (1965)	-2	3	-5
Spain	-9	-8	-1

a Calendar year following devaluation

Source: International Financial Statistics

IV. Devaluation and Aggregate Demand

Economies have frequently been observed to pause following a currency devaluation, experiencing a slowdown in business activity and a rise in unemployment. These slumps at first glance are puzzling, since a successful devaluation is conventionally regarded as expansionary in its effects, as expenditure is switched from foreign to domestic goods, thereby stimulating domestic business activity. The observed slowdowns may of course be due to developments unrelated to the currency devaluation, such as unusually bad crops. This was an important factor depressing the Indian economy in 1966, and it may also have been a factor following the Colombian devaluation of late 1962. Or the slowdowns may be due to overly stringent monetary and fiscal policies that are undertaken along with devaluation, to assure that the trade balance will improve and to reduce the dangers of a wage-price spiral following devaluation.

The currency devaluation may itself have a direct impact on the level of aggregate demand, however, and that direct impact will not always be the expansionary one conventionally assumed. This is obviously so when the current account deficit worsens; in that case the public will be spending even more on imports than it receives for exports than before devaluation, and expenditure on domestic goods and services, other things being equal, will decline. A special case of this phenomenon may arise when devaluation is accompanied by import liberalization, with the result that imports absorb a larger amount of domestic purchasing power.

But devaluation may be deflationary -- in the relevant sense of reducing total expenditure on domestic goods and services -- even when it succeeds in reducing the current account deficit. Following devaluation, domestic spending on imports may increase sharply even though the volume of imports has fallen. This development will occur if the demand for imports is inelastic, in which case devaluation acts much like an excise tax on tobacco or liquor, increasing the price in terms of domestic currency, but not reducing the volume purchased proportionately. Increases in such excise taxes are of course deflationary even though they raise the prices of the products subject to tax. The price elasticities implied in Tables 1 and 4 above suggest that in the short run the demand for imports into less developed countries is quite insensitive to price changes, a fact that should not be surprising given the heavy concentration of raw materials, foodstuffs, and capital goods in their imports. For many less developed countries, those imports potentially competitive with domestic production (implying a relatively high degree of price substitution) have long ago been effectively excluded through tariffs and other policies of import substitution.

The deflationary impact of the increase in domestic currency prices of imports may of course be offset by an increase in incomes arising from sales of exports. But if imports substantially exceed exports even after devaluation, as they typically will for a capital-importing country, the excise-tax effect of devaluation on imports may more than offset increased spending from enlarged incomes in the export section.⁷ This deflationary impact presupposes that at least some of the capital inflow, which after devaluation commands larger amounts of domestic currency, is not immediately spent.

The government recipient of a program loan to finance imports, for instance, must sterilize the domestic currency proceeds arising from the sale of foreign exchange, e.g. by retiring public debt held by the central bank. In this respect the monetary and expenditure effects of a devaluation are similar to those of an increase in taxes not paralleled by an increase in government expenditures.

Even when devaluation is deflationary, incomes will not fall if the deflationary impact is more than offset by expansionary fiscal or monetary action. And where policies are endemically expansionary, the deflationary impact of devaluation will be a welcome antidote.⁸ But in framing policies to accompany devaluation the possibility that its direct effect may be deflationary should be given more cognizance than it often is, so as to avoid unnecessary deflation.

Table 7 indicates four magnitudes influencing aggregate demand in the year following devaluation: changes in the balance on goods and services (measured in domestic currency), in government expenditure on goods and services, in tax revenues, and in the money supply. These recorded changes are not entirely "exogenous" determinants of national output and income, since as already noted the level of imports will be influenced by the level of domestic spending as well as by devaluation and other factors, and of course changes in tax revenues will also be influenced by changes in incomes as well as by the new taxes and improved collection that often accompany devaluation. Nonetheless, they give a rough indication of the impact on aggregate demand of devaluation in comparison with that of other measures.

Table 7

Increases in Economic Aggregates from Year Preceding Devaluation
(billions of national currency units)

Country	Balance on Goods and Services	Government Expenditure	Net Tax Revenues	Government Deficit	Money Supply ^a
Argentina	10.3	35.2	n.a.	n.a.	51.3
Brazil	.68	.73	1.87	-1.14	3.22
Canada	.09	.59	.93	-.34	.62
Colombia (1962)	-.98	.95	.95	--	1.17
Colombia (1965)	-1.56	1.63	2.08	-.45	1.39
Costa Rica	-.035	.034	.074	-.040	.081
Ecuador	.21	.29	.22	.07	.05
Greece	-.11	.46	1.70	-1.25	2.43
Iceland (1960)	-.09	.36	.42	-.06	.03
Iceland (1961)	.10	.31	.41	-.10	.36
India	-.17	3.32	2.41	.91	3.12
Israel	-.52	.27	.20	.07	.31
Korea (1960)	-6.0	4.0	2.2	1.8	.2
Korea (1961)	-4.2	7.9	1.7	6.2	10.1
Korea (1964)	-0.3	15.4	13.1	2.3	14.1
Mexico	.46	1.36	1.16	.20	1.31
Morocco	-.15	.16	n.a.	n.a.	.58
Pakistan	-.38	.20	-.24	.43	.70
Peru	2.2	1.1	1.3	-0.2	1.14
Philippines (1962)	.07	.27	.26	.01	.29
Philippines (1965)	.81	.19	.20	-.01	.18
Spain	22.7	6.0	12.5	-6.5	1.2
Tunisia	-.025	.015	.018	-.003	.001
Turkey	-1.12	1.35	.95	.40	.61

^aTwelve months starting with month preceding devaluation

Source: U.N. Yearbook of National Accounts Statistics; and International Financial Statistics

The balance on goods and services when reckoned in domestic currency actually worsened following devaluation in 14 instances, indicating deflationary pressure on the economy.⁹ The worsening of the balance exceeded increases in government expenditure in six instances, thus offsetting additional expansionary pressures from that source; and in thirteen instances the change in the balance plus the change in the government deficit indicate more deflationary policies than in the year preceding devaluation.

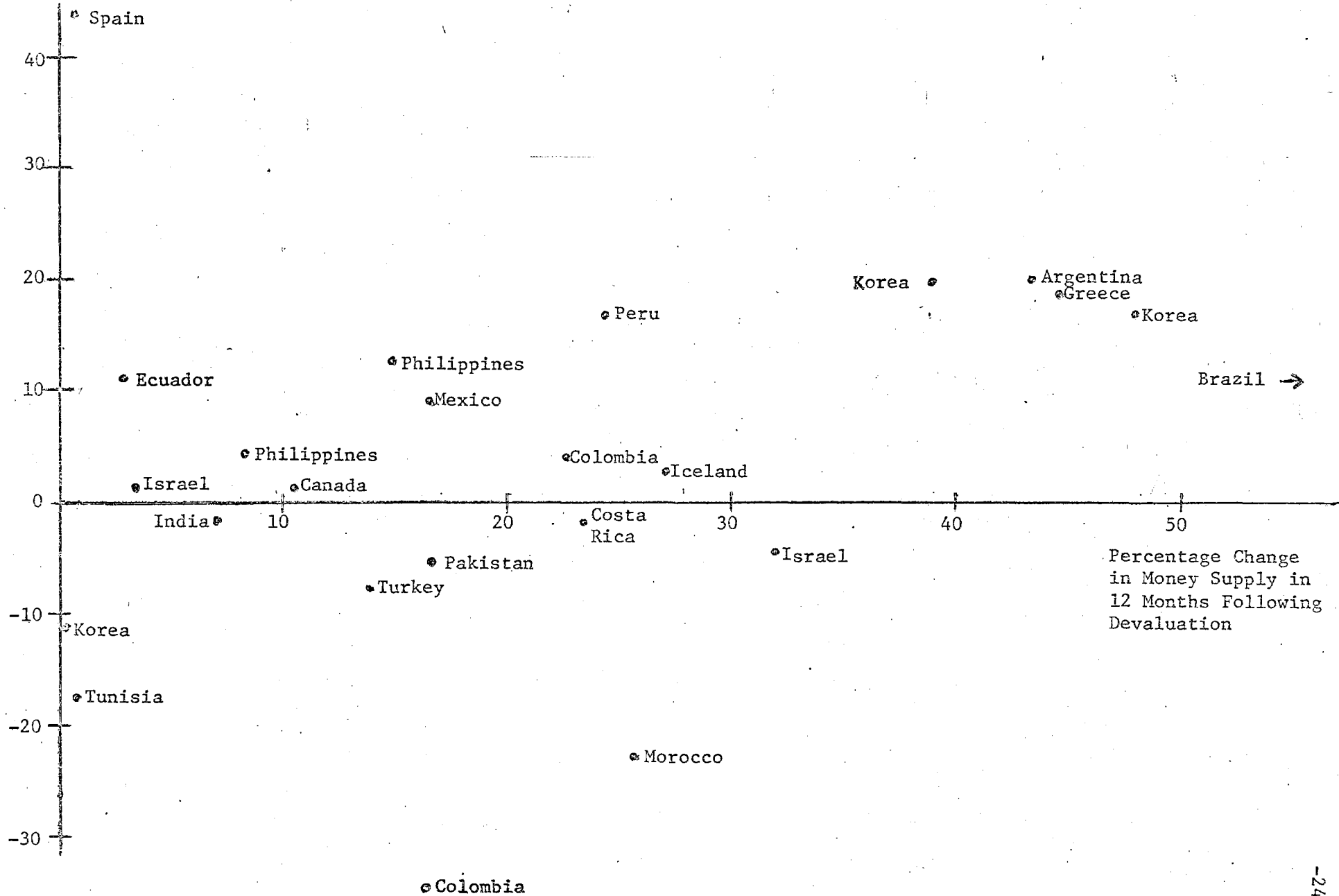
The money supply was not allowed to fall in any of these countries in the twelve months following devaluation, although the rise in Korea (1960), Spain, and Tunisia was negligible. Given the emphasis sometimes placed on the need to maintain a tight control over credit to make a devaluation work, it is noteworthy that for these devaluations the relationship between the percentage increase in the money supply, as a rough proxy for credit conditions, and the percentage improvement in the balance on goods and services is a very loose one indeed, and if anything shows a positive correlation (chart 1).

Devaluation can exert a deflationary impact on the economy in two other ways. When currency devaluation redistributes income from those segments of the population with high propensities to spend on domestic goods and services, those with low propensities to spend domestically, e.g. from wages to profits or rents, domestic demand will tend to fall. The low spending group may have a higher propensity to save or it may have a higher propensity to spend on imported goods. In the latter case devaluation-induced redistribution may actually worsen the trade balance as well as causing deflation.

Chart 1

Relationship Between Change in Money Supply
and Improvement in Current Balance
Following a Devaluation

Improvement in
Balance on Goods
and Services as
a Percentage
of Initial Imports
of Goods and Services



Deflationary redistributions seem to have been important in the declines in economic activity following devaluation in Argentina in 1959 and in Finland in 1957.¹⁰ It is unclear how general this phenomenon is. Typically real wages do fall following devaluation, and some profits -- those in the export and import-competing industries -- certainly rise. Whether this redistribution typically leads to less spending, however, is more doubtful; investment may be stimulated by the higher profits. Deflationary redistribution is perhaps most likely when the principal exports are primary products, when the elasticity of supply of those products is low in the short run, and when investment for increased output is not stimulated by higher profits or rents. As already noted, however, currency devaluation in these circumstances is often accompanied by the imposition of new taxes on the exports of primary products, thereby transferring to the government what would otherwise become higher profits or rents. These taxes are of course deflationary themselves, except to the extent that the government quickly converts new revenues into higher expenditures.

The third source of devaluation-induced deflationary pressure arises from the presence of large private external debt, denominated in foreign currency. Devaluation will increase both the outstanding debt and the debt-servicing burden in terms of domestic currency. The former development may throw some firms and individuals into technical bankruptcy, and the latter will reduce their net earnings. On both counts private investment will be reduced, and indeed if bankruptcy is sufficiently widespread a serious investment slump could develop. This factor is said to have been important in Argentina

following the devaluation in 1962, when many firms that had borrowed liberally and at high interest rates abroad for working capital as well as for capital equipment found themselves with sharply increased obligations after the peso was devalued from 83 to 130 per U.S. dollar.¹¹

Where external debt is significant, its presence may inhibit the economic authorities from devaluing both for fear of generating bankruptcy and disrupting business and for fear of increasing the real value of the external debt, the latter concern presupposing a deterioration in the terms of trade.

V. Devaluation and the Wage-Price Spiral

An oft-expressed fear concerning currency devaluation is that it will generate round after round of price and wage increases that will nullify the price advantages the devaluation is designed to give the country's products in domestic and foreign markets. The increase in import prices, it is said, will drive up the cost of living and this will stimulate demands for higher wages, which in turn will raise domestic money costs and hence the cost of living, and so on, in a vicious cycle, ultimately undercutting the gains from devaluation. Furthermore, imported goods may represent important inputs into production for export, and devaluation in this case will directly raise the production costs of exports.

The problem is more complex than this, and the outcome depends in an important way on the dynamics of response by wage-earners and businessmen (including farmers) to higher costs and prices. The conditions required for a complete negation of the price effects of devaluation are quite extreme.

Devaluation does of course raise domestic prices of imports and export products -- that is the mechanism whereby it improves the trade balance -- and wages may well respond to the resulting increase in the cost of living¹², thereby weakening the effects of devaluation. But nullification of these effects requires both that wage-earners recoupe entirely their standard of living through higher wages and that the real value of other income -- profits, rents, and taxes -- is also maintained.¹³ This is simply another way of saying that in order for an improvement to take place in the balance on goods and services, the real expenditure of some segment of the population -- wage-earners, businessmen, landlords, or government -- must fall, and such a decline will ordinarily be achieved only if there is a decline in the real income of some groups.¹⁴

Partial reversal does not exhaust the range of possible outcomes. On the one hand, devaluation may in fact result in very little change -- or even a reduction -- in prices if it is used to replace already existing import controls, subsidies to exports, and other devices to improve the country's payments position. Where imports have previously been restricted by quotas or exchange licensing, devaluation will simply reduce importers' profit margins, acting like a tax on unearned profits generated by the artificial scarcity. Under these circumstances there will be little or no increase in prices, depending on the exact relationship of the devaluation to the scarcity markups already being charged to the consuming public. If devaluation is accompanied by relaxation or removal of the quotas it will increase the degree of competition in the economy, and this in turn may actually lead to a reduction in prices, including prices of domestic goods

with (previously controlled) import content.¹⁵ Furthermore, if monopolistic conditions prevail in the export industries, devaluation may serve to stimulate output without leading to much increase in prices, by increasing the elasticity of demand facing the exporters.¹⁶

On the other hand, devaluation may also trigger the release of legal or conventional restraints on other prices, as when devaluation is taken as the excuse for raising urban bus fares. Especially under circumstances of suppressed inflationary demand, there are likely to be many prices that do not reflect what the market will bear, for fear of public opprobrium or legal sanctions or even just out of ignorance or inertia or implied contracts on the part of the sellers of goods and services. Devaluation may provide the occasion for a general reassessment of pricing practices and recontracting, thus stimulating price increases that could have taken place earlier (and are likely to take place sooner or later), but did not. In this case, domestic costs could rise by more than the amount of the devaluation.

It should be noted that monetary and fiscal policies play a crucial role in determining the extent to which the relative price effects of devaluation are offset by increases in domestic costs. Without monetary expansion to "validate" increased money wages and prices, demand would fall and unemployment would result. The dynamics of response to devaluation thus can influence the ultimate impact of devaluation on the country's trade position. Ideally, devaluation will in the first instance raise local currency prices and hence profits in the export and import-competing industries.

This in turn will stimulate those industries to expand, both by hiring additional labor and by increasing investment in capacity (or, in the case of agricultural output, new planting). Labor will be bid away from the non-trade sectors of the economy, possibly with some increase in wages, which the trade sector can afford to pay out of its higher profits, and this will tend to pull up money wages throughout the economy -- but as a result of expansion of the foreign trade sector.

An alternative course of events is far less favorable. It arises if the foreign trade sector fails to expand output in response to devaluation, either because of misguided efforts to preserve the status quo or because the gestation period for new investment is longer than the increased profits from devaluation are expected to last. If then wage-earners respond to increases in the cost of living and to higher profits in the foreign trade sector by demanding, and getting, higher money wages, this will tend to pull up wages throughout the economy. But since profits in the non-trade sectors have not risen (on the contrary, the costs of their import requirements have risen), they can meet the enlarged wage demands only by charging higher prices for their output or by releasing workers. At this point the monetary authorities are confronted with a cruel dilemma: they can maintain tight monetary control, thereby inhibiting price increases but also inducing unemployment, or they can ease up on monetary conditions, thereby validating the increases in wages and domestic prices and undercutting the relative price effects of the devaluation. Thus the speed with which output and employment in the trade sector is increased as compared with the

speed with which workers demand and get higher money wages can be a critical factor in determining the extent to which a devaluation will succeed.

It is difficult to get good evidence on the influence of devaluation on prices and wages, partly because the relevant information on wages and prices is often non-existent or of poor quality, partly because movements in wages and prices are influenced by many other factors, such as harvest conditions and productivity growth in the manufacturing sector. Table 8 indicates price and wage movements, where data are available, for twelve months from the month preceding the month of devaluation. Price and wage movements beyond that time will of course continue to be influenced by the events set in motion by devaluation, but as time progresses other, unrelated, factors play an increasingly dominant role. Data are given for the domestic prices of imported goods, the general wholesale price index, the consumer price index, and wages in manufacturing, with data of the first and last type available for only about half the countries. For comparison, the first column shows the extent of devaluation as it should affect the local currency price of imported goods at the port of entry.¹⁷

The evidence in Table 8 clearly suggests that devaluation does lead to an increase in prices, and at least indirectly to an increase in wages, but that increases in the cost of living and in wages are far less than the devaluation -- with the notable exception of Colombia in 1962. In no case, however, did the consumer price index decline, and the wholesale price index declined only in Costa Rica. In six instances the consumer price index increased less in the twelve months following devaluation than it had

Table 8

Price and Wage Increases in the 12 Months
Following Devaluation
(percent)

Country	Time of Devaluation	Devaluation ^a	Import ^b Prices	Wholesale Prices	Consumer Prices	Manufacturing Wages
Argentina	Jan. 1959	156	180	115	103	62
Brazil	Sept. 1964	156	n.a.	53	67	49 ^c
Canada ^d	1961-1962	11	6	3	5	6
Colombia	Nov. 1962	30	33	32	41	37
Colombia	Sept. 1965	33	49	18	20	14
Costa Rica	Sept. 1961	6	3	-1	5	13 ^c
Ecuador	July 1961	19	n.a.	2	--	5
Greece	Apr. 1953	69	n.a.	28	22	n.a.
Iceland	Feb. 1960	69	n.a.	6	n.a.	n.a.
Iceland	Aug. 1961	12	n.a.	12	n.a.	n.a.
India	June 1966	37	41	15	13	n.a.
Israel	Feb. 1962	35	n.a.	n.a.	9	10
Korea	Feb. 1960	51	n.a.	15	14	16
Korea	Feb. 1961	56	14	10	--	8
Korea	May 1964	100	36	12	13	18
Mexico	Apr. 1954	45	n.a.	19	17	16
Morocco	Oct. 1959	14	15	16	6	5 ^c
Pakistan	July 1955	39	n.a.	n.a.	4	4 ^c
Peru ^e	1958	45	n.a.	61	26	11 ^c
Philippines	Jan. 1962	19	9	9	6	9
Philippines	Nov. 1965	--	n.a.	4	9	8
Spain	July 1959	35	3	1	1	n.a.
Tunisia	Sept. 1964	20	21	17	11	n.a.
Turkey	Aug. 1958	64	27	25	32	21 ^c

a $k/(1-k)$, where k is the effective devaluation for imports shown in Table 1.

b In local currency

c Calendar year

d May 1961 to May 1963

e Dec. 1957 to Dec. 1959

Sources: International Financial Statistics, U.N. Monthly Bulletin of Statistics, and I.L.O., Year Book of Labour Statistics

in the twelve months preceding devaluation, and that relationship also occurred in six instances with wholesale prices, including five cases -- Brazil, Ecuador, India, and Korea in 1961 and 1964--common to both groups.

Import liberalization helped to hold down price increases in a number of countries, most notably in Korea (1964), the Philippines and Spain. But even in the absence of import liberalization, price increases would be moderated to the extent that the higher cost of foreign exchange was absorbed by declines in importers' margins, as they might be if artificial scarcities (e.g. through import quotas or foreign exchange licensing) had already led to high local prices for imports. A comparison of the first two columns of Table 8 shows that import prices did generally rise less than the amount of effective devaluation, suggesting a sharp drop in importers' margins and reflecting import liberalization where it occurred. But the data on import prices are too fragmentary and the data in both columns are of such uncertain quality that no strong case can be made. It is noteworthy, however, that in eleven instances the wholesale price index rose more sharply than the consumer price index, despite a normal expectation for the opposite to occur because of the wage component in consumer prices. This may be due in part to the greater importance of imports in the wholesale price index, but it may also suggest that scarcity markups were trimmed following devaluation. (Where consumer prices rose much more than wholesale prices, as in Colombia (1962), it suggests that devaluation may have triggered other price increases, not directly related to increased costs of imported goods.)

The hypothesis that markups on imports were sharply reduced following devaluation is further supported by the month-to-month pattern of import prices following devaluation. In the months immediately following devaluation, import prices in local currency rise sharply as importers attempt to pass the full increase in the cost of foreign exchange on to their customers. A peak is reached after two or three months, however, and prices of imported goods fall subsequently for several months, as importers find that the market will not support the higher prices -- they had already been extracting scarcity prices before the devaluation, and this limited the extent to which buyers would pay more after devaluation without a sharp drop in supplies. Unfortunately few countries compile data on the local currency prices of imports, but this time pattern could be observed, among those that do, in Colombia (1965), India, Morocco, Spain, and after the South Vietnamese devaluation of 1966.

Data on wages are sparse and of low quality. Where such data do exist, they indicate an increase in the year following devaluation by rather more than in the preceding. But in nine out of eighteen cases wage increases rose by less than the increase in consumer prices, despite a normal expectation, in a growing economy, for wage increases to exceed increases in the cost of living. Moreover, the wage figures available are for manufacturing, and these probably increased rather more rapidly than labor incomes generally, since manufacturing labor is usually better organized and it is working in a sector (unlike the service sector) that should benefit from devaluation.

On only two occasions did wage increases approach (and exceed) the degree of devaluation. Thus it appears that wage increases do not generally undercut the relative price effects of devaluation, and often real wages actually fall.

Prices, like the level of economic activity, are influenced by factors other than devaluation. On the classical view, price level increases are largely determined by changes in the money supply. To hold the price level unchanged following a devaluation would require a fall in prices of non-trade goods and services, and to bring that about would in most countries require an unacceptable degree of monetary deflation. Where agricultural output is a significant portion of total output, as it typically is in less developed countries, variations in farm production will also have an important influence on prices. Again the price level could be held steady in times of poor harvest by sufficiently stringent monetary deflation, but again such deflation is likely to be politically unacceptable.

The combined effects of devaluation, changes in the money supply (\dot{M}), and variations in food production (\dot{F}) on wholesale (\dot{W}) and consumer (\dot{C}) prices are indicated in the following cross-sectional regressions, which implicitly assume the same economic structure (e.g. ratio of trade to non-trade sector) for all the 21 and 19 countries included in the two regressions. The variables are all percentage changes, and standard errors of

$$\dot{W} = 2.83 + 0.32 \left(\frac{k}{1-k}\right) + 0.38 \dot{M} - 0.70 \dot{F} \quad R^2 = .59$$

(.14) (.33) (.39)

$$\dot{C} = -0.41 + .42 \left(\frac{k}{1-k}\right) + 0.24 \dot{M} - 0.71 \dot{F} \quad R^2 = .78$$

(.10) (.25) (.28)

the estimated coefficients are in parentheses. The regressions show that on average wholesale prices rise by less than a third of the devaluation, with a somewhat greater impact on consumer prices; that increases in the money supply increase prices, but (in a period following devaluation) not by a corresponding amount;¹⁸ and that changes in food production have a substantial impact on both wholesale and consumer prices. In all, over three quarters of the variation in consumer prices and nearly three-fifths of the variation in whole prices could be "explained" by these three variables, although of course this type of evidence is only suggestive, not definitive.

A number of countries hold down the impact of devaluation on consumer prices, and hence presumably also on wages, by subsidizing major items in the cost of living or by imposing price controls. India in 1966 and Korea in its various devaluations maintained price controls, while Colombia in 1965 continued to allow imports of major consumer items to enter at the pre-devaluation exchange rate for some months following devaluation. When multiple exchange rates are in effect, the latter practice is common. Typically, however, price controls are relaxed and special exchange rates

are reduced or removed within a year following devaluation, so these devices are only partially reflected, if at all, in the observed price changes recorded in Table 8.

To sum up, the worst fears concerning wage-price spiraling as a result of devaluation are unfounded. Only Colombia (1962) and possibly Costa Rica represent exceptions, and in the former case a serious decline in food production greatly aggravated the increase in the cost of living. Indeed, harvest fluctuations generally seem to play an important role in determining the cost of living, and devaluations are less likely to be negated by wage increases if they are undertaken in years of good harvest. Finally, real wages fell following devaluation in a majority of the cases considered here--and real wages were undoubtedly reduced from what they otherwise would have been in most of the other cases--a development that is required in the short run if devaluation is to lead to the necessary reallocation of resources to the export and import-competing industries. This does not always imply a long-run reduction in real wages, for where the foreign trade industries are relatively labor intensive, real wages will ultimately be increased by devaluation.

VI. Political Effects of Devaluation

Even if devaluation works, policy makers may shy away from it on political grounds. National prestige and local pride are frequently factors inhibiting resort to currency devaluation, but an even more important deterrent is the expectation that it will spell political suicide for those responsible for the decision.

A simple test of the political consequences of devaluation is whether the government -- in particular the prime minister or president -- remained in power during the following twelve months. There are obvious weaknesses with this test. First, a government may have fallen just before devaluation, as a result of economic mismanagement or for other reasons, leaving its successor the opportunity to blame the necessity for devaluation on the fallen government. Or a government may have delayed the devaluation to a time which it thought politically safe. Finally and most important, devaluation is often a necessary consequence of economic mismanagement, and it is really the mismanagement, rather than the devaluation, that is and should be the target of political criticism. Thus even when devaluation is in fact the most appropriate remedy, it may be confused with the disease, either by the public or in evaluating the response of the public.

Seven out of the 24 governments involved in this study fell in the year following devaluation. In five of these seven cases the political change appears to have been unrelated to the devaluation. The King of Morocco removed his prime minister because of the latter's liberal and modernizing inclinations. General Park's 1961 coup in Korea involved a much broader range of issues than devaluation, although mismanagement of the economy may have contributed to the general dissatisfaction. Costa Rica and Colombia (1965) both experienced orderly changes of government, predictable on past experience even without the devaluations¹⁹, although economic issues were important in both cases. In the Philippines (1965) President Macapagal was voted out despite his attempt to woo the business community through devaluation of the export rate three days before the election.

In both Peru and Ecuador, however, economic mismanagement leading to the necessity of currency played a substantial role in the change of government.²⁰ Economic policy played a substantial role in the loss of parliamentary strength of the Conservative Party in Canada in 1962, but the government held on for more than a year. The Congress Party in India also lost ground in 1966 over its economic policies. In Israel the devaluation and associated policies led to a hotly debated motion of no confidence, but the government survived it. And in Turkey the coup of 1960 followed strong and widespread dissatisfaction with economic policy, but that change fell outside the arbitrary limit of twelve months set here.

It might be thought that the tactics used in devaluing a currency will influence the chance of political survival, and in particular that resort to piecemeal devaluation may be less of a threat to those in power than a sharp, once-for-all change in rate. The nature of this study precludes a careful examination of this possibility, for the observations under consideration all involved fairly substantial changes relative to the periods immediately preceding and following. It is perhaps worth noting, however, that in four of the seven cases in which the government fell a formal, de jure change in parity was involved. Two other cases involved de facto changes in a major rate with no change in parity. And Peru had a depreciating flexible exchange rate.

Governments of course change even without devaluations, and some standard of comparison is needed to determine whether seven out of twenty-four - twenty-nine percent - is a large or a small number of government

changes within a twelve month period. To provide such a comparison, a random sample was chosen from the period 1950-1965 of countries that did not devalue within a calendar year. In this sample, 14 percent of the governments were changed. It thus appears that currency devaluation, or at least the conditions leading to the necessity for devaluation, roughly doubles the likelihood of loss of power by the government undertaking the devaluation. This chance still remains less than one in three, however, even including changes in government in which devaluation does not seem to have been an issue.

As might be expected, finance ministers fared rather worse than governments: fourteen failed to stay in their jobs during the twelve months following devaluation. Seven of these of course went with their governments, but an additional seven -- in Argentina, Colombia (1962), India, Korea (twice), Pakistan, and the Philippines -- were ousted or left even when the governments stayed. Again, sometimes the change was not related specifically to devaluation. In March 1963 the entire Colombian cabinet resigned on a political issue, for instance, and Korean ministries were in constant flux throughout this period. A randomly selected control group suggests that ^{seven} out of forty finance ministers in non-industrial countries -- eighteen percent -- may be expected to change in a twelve-month period even without devaluation. Thus devaluation seems to increase substantially the possibility that the finance minister of the devaluing country will lose his job -- the percentages of the finance ministers that were changed in our two samples, one with devaluation and the other without, differ by a factor of three.

VII. Conclusions and Recommendations

Any conclusions drawn from this examination of two dozen currency devaluations must be highly tentative, for the reasons given earlier. The data are poor. Each country is unique in its economic structure and in its response to sharp changes, such as devaluation brings about, in its domestic price structure and in its monetary relations with the rest of the world. Wage costs and prices, aggregate demand, and trade flows are all subject to a wide range of influences other than currency devaluation.

Precisely because of these weaknesses, however, generalizations from one or two devaluations are especially hazardous. There is some safety in numbers. Inspection of two dozen cases filters out some of the unique elements that exist in each instance, and provides some assurance against gross error arising from poor data. However, it also requires that the level of explanation and interpretation must be more general and less precise than would be permitted by case studies in depth.

With these qualifications, the following generalizations can be made:

First, currency devaluation seems to be successful, in the sense of improving the balance on goods and services. To be sure, the price elasticities implied by the degree of improvement are quite low, but they are high enough for success. Some of the apparent exceptions to this generalization can be explained by other (possibly related) factors, such as a sharp increase in the inflow of capital following devaluation. Additional foreign aid would permit more generous import licensing, even in

the absence of a general import liberalization program; and additional direct investment might raise imports directly. In a few cases, however, devaluation simply failed to have its intended effects. The one-year period used to measure performance of course offers far too little time for the full effects of devaluation, which may require investment in new capacity, to work themselves out. This fact gives greater weight to the high proportion of "successes" in the year following. The first year following devaluation is however, the period of greatest concern to those responsible for making the decision.

Second, quite apart from monetary and fiscal policies, devaluation itself often initially tends to depress economic activity in the devaluing country, contrary to what has normally been expected. This effect may arise from devaluation-induced shifts in the distribution of income from low to high savers; or it may arise from the large drain on domestic purchasing power created by a rise in the local-currency prices of imports, in circumstances in which imports exceed exports and the price elasticity of demand for imports is rather low -- both conditions typically found in less developed countries.

Third, devaluations, even large devaluations, do not seem to worsen the devaluing country's terms of trade. Most of the countries considered here apparently account for too small a portion of the world market for devaluation-induced changes in the terms of trade to be a serious consideration.

Fourth, currency devaluation does stimulate increases in local prices of goods and services closely linked with foreign trade; these include export products and local production in competition with imports, as well as imports. It is also accompanied by larger than normal wage increases. But rarely is the increase in wages and other local costs great enough to nullify the effects of devaluation, at least within the following twelve months. Unrelated events, such as bad harvests, can reduce considerably even the long run benefits from devaluation by contributing to an inordinate rise in the cost of living and hence in wages. This seems to have been a key factor in the instances in which the effects of devaluation were substantially weakened by increases in local costs.

Finally, a decision to devalue does not typically spell political demise for governments that undertake it, but devaluation does seem to be associated with a somewhat higher likelihood of a fall in the government. The chance that a finance minister will lose his job is substantially higher.

No clear-cut recommendations emerge from the study, except that considerable attention should be paid to the economic environment before a decision to devalue is made. The short-run effects of devaluation can be greatly complicated and the long-run effects substantially weakened if it is accompanied by a poor harvest, if it is accompanied by a sudden release of prices that have been hitherto controlled by law or convention, or if it is immediately followed by a major wage settlement. In all of these cases, increases in wages and other costs are made more likely and will reduce the relative price shifts that the devaluation is designed to bring

about. A delay in wage response to devaluation is likely to mean a lower overall increase in money wages (but not necessarily in real wages) in the long run.

The price and wage effects of devaluation may be mitigated if import controls are relaxed simultaneously. Historically there has often been a delay of several months or more before import liberalization is undertaken, and by then some of the damage may have been done. Early import liberalization will serve both to moderate increases in local prices and, by absorbing more local purchasing power through expenditure on imports, it will also exert some deflationary pressure on the economy.

Finally, however, where analysis suggests that devaluation reinforced by liberalization is likely to exert a strong deflationary impact on the economy, it might be accompanied by relatively early offsetting monetary expansion. Early expansion will help to avoid unnecessary unemployment and excess capacity and it should thereby forestall the inevitable political demands for economic expansion later. Delayed expansionary policy may come into play just as the devaluation itself is also providing some domestic expansion, and together they may exert undesirable upward pressure on local wages and prices well after the devaluation. On the other hand, such "fine tuning" may not be possible given our still quite imperfect understanding of the dynamics of response to devaluation or other major policy changes.

Appendix A

Calculation of Effective Devaluation

As noted in the text, the change in a currency's par value does not necessarily imply a corresponding change in the cost to importers of foreign exchange and the local proceeds to exporters arising from their foreign currency sales. Multiple rates may be changed by differing amounts, tariffs may be changed as part of a policy package, certain imports may be subsidized for a period following devaluation, or pre-devaluation export subsidies may be reduced or removed. The effective devaluation for a particular commodity should take into account all of these factors.¹ Unfortunately such calculations would be tedious in their detail for countries with complicated changes in their exchange rates, even if the requisite data were readily available, which they are not. The figures for Greece and Israel, however, reflect such calculation by Eliades and Riemer, respectively.²

A simple and expedient, though imperfect, shortcut was adopted here. Where countries record the value of their foreign trade both in foreign and in local currency, an implicit weighted average exchange rate for a given period can be derived from the two sets of figures, where the weights are the value of exports or imports subject to the various exchange rates.

The changes in effective rates recorded in Table 1 were derived from these average implicit rates on exports and imports, calculated for the month preceding the month of devaluation and for the month following the month of devaluation. This procedure should not introduce a downward bias because of devaluation-induced changes in the composition of trade, since these periods are too close to the devaluation for trade composition to be much affected by it. But of course the procedure is subject to error where the composition of trade subject to different rates has changed sharply for other reasons. Moreover, this procedure does not in all cases incorporate changes in import duties, for the local currency value of imports may be recorded exclusive of duties. The figure for Canada is adjusted to make allowance for its import surcharges. In a few cases--Brazil, the Philippines (1962), and Spain -- the change in multiple rates extended over a period longer than one month, and a correspondingly longer interval has been included here.

Where monthly trade data were not available in both foreign and domestic currency, or where one series is artificially derived from the other by use of the exchange parity, balance-of-payments data (in foreign currency) and national accounts data (in local currency) were used instead. This has the twofold disadvantage as compared with the former procedure that balance-of-payments and national accounts data are typically available only on an annual basis, and the definition of "goods and services" in the two accounts is not always identical. Further errors are thus introduced. Also, for Turkey this technique permitted a calculation only for net exports.

Finally, India and Morocco lack either foreign-currency balance-of-payments data or exports in the GNP accounts, so even this technique could not be used, but known reductions in import surcharges are deducted from the nominal devaluation.

Appendix B

Devaluation and Aggregate Demand

Devaluation is normally aimed at improving a country's balance-of-payments position and especially its balance on goods and services. In assessing its success it is therefore appropriate to focus on the country's earnings and payments in terms of foreign currency. But the impact of devaluation on total demand within the devaluing country depends on the resulting increase in receipts for exports and payments for imports in terms of domestic currency, since that is the unit in which incomes are earned expenditures made.

For a country with a unified exchange rate the relationship between a given balance on goods and services in foreign currency and in domestic currency is $B = rD$, where B is the balance in foreign currency, D is the balance in domestic currency, and r is the exchange rate indicating the foreign currency price of a unit of domestic currency. The change in the foreign-currency balance following currency devaluation is then:

$$(1) \quad \Delta B = (r+\Delta r)\Delta D + \Delta rD = r(1-k)\Delta D - kB$$

Here Δ indicates a change in the variable it precedes, and $k = -\Delta r/r$, the proportionate change in exchange rate (taken to be positive for devaluation).

A devaluation is assumed to be successful if, other things being equal, the balance in terms of foreign currency improves (ΔB is positive). Relationship (1) shows that when the devaluing country has an initial deficit on goods and services ($B < 0$), a successful devaluation will reduce total demand ($\Delta D < 0$) rather than increase it, as is usually assumed, if improvement in the balance in foreign currency falls short of the initial deficit times the proportionate devaluation (i.e., $\Delta B < -kB$). Even when the improvement is greater than this, the stimulus to aggregate demand will be substantially less than the improvement in the foreign-currency balance converted into domestic currency. This is because residents after devaluation must pay more in local currency for a dollar's worth of imports, thereby enlarging the absorption of local purchasing power by the import surplus.

These conditions can be reformulated in terms of price elasticities, measuring the responsiveness of demand and supply of exports and imports to changes in relative prices.¹ On the assumption that the devaluing country is too small to influence the dollar prices of its imports and that the local currency supply price of its exports is unchanged by devaluation, the following table indicates the range of import demand elasticities for which a small successful devaluation will be deflationary, for various values of export demand elasticities and the ratio of exports to imports.

1. See my "Devaluation and Aggregate Demand," Yale Economic Growth Center Discussion Paper No. 55, June 1968, mimeo.

Table B-1

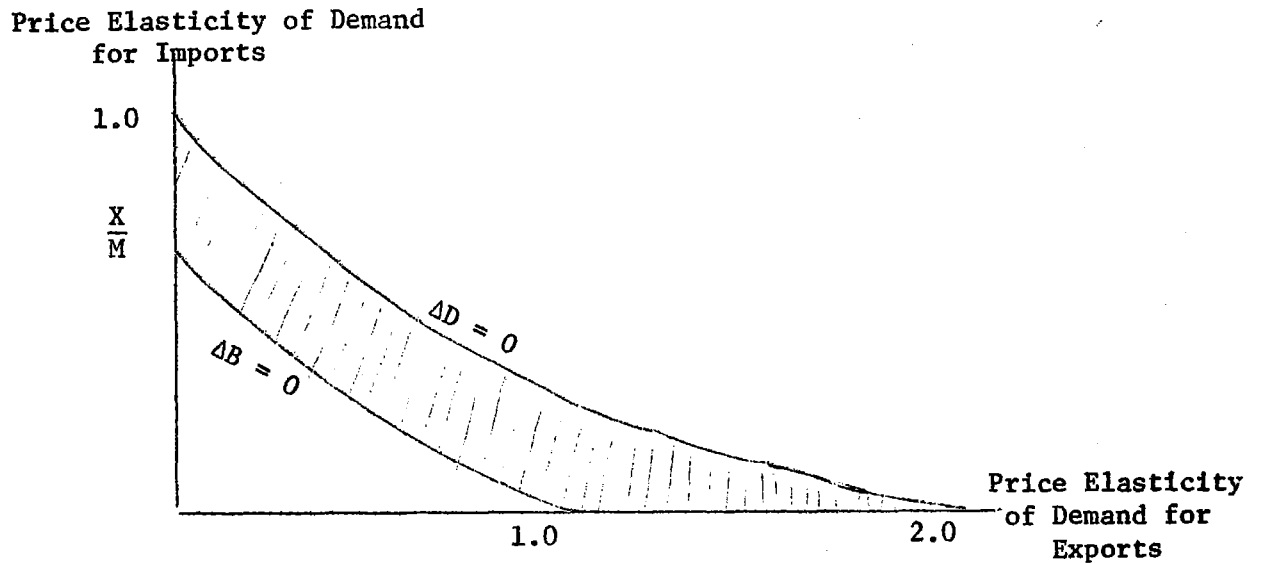
Range of Import Demand Elasticity for which Successful Devaluation will be Deflationary

Initial Trade Ratio	Elasticity of Demand for Exports		
	0.5	1.0	1.5
.9	.45 - .55	0 - .1	--
.8	.40 - .60	0 - .2	--
.7	.35 - .65	0 - .3	--
.6	.30 - .70	0 - .4	0 - .10
.5	.25 - .75	0 - .5	0 - .25

Note: Table computed for perfectly elastic supply of exports and imports.

If exports face increasing costs the range of elasticities will be lower than those indicated. The middle area in Chart 1 shows the demand elasticity region in which successful devaluation will be deflationary, drawn on the assumption that the foreign currency prices of imports are uninfluenced by devaluation and that the elasticity of supply of exports is two. On these assumptions, any combination of demand elasticities in the shaded area will lead to an improvement in the balance on goods and services in foreign currency but to a deterioration of the balance in domestic currency, hence to deflationary pressures.

Chart 1



Many less developed countries are likely to satisfy the conditions under which devaluation will have a negative effect on aggregate demand, at least in the period immediately following devaluation. As capital-short countries, most of them have continuing deficits on goods and services, matched by long-term capital inflows. As countries which have pursued policies of import substitution, most of them have shifted the composition of their imports from finished products to raw materials, intermediate products, and capital goods, thereby lowering the price elasticity of demand for imports. Import controls reinforce this reduction in price

sensitivity. Finally, most of the less developed countries experience supply constraints in the short run, so the volume of exports cannot be increased substantially until some time has elapsed. In the short run, the demand elasticity for exports is also likely to be small. Thus a deflationary impact is likely, although it may be merely a short-run phenomenon.

Where devaluation is accompanied by trade liberalization, its success should be measured by the improvement over the current balance that would have prevailed with liberalization in absence of the devaluation. By enlarging the "pre-devaluation" deficit, trade liberalization therefore increases the likelihood that devaluation will be deflationary.

Whether devaluation is in fact deflationary depends also on the nature and treatment of the long-term capital inflows. If capital inflows are fixed in terms of local currency (as some private inflows might be), devaluation will reduce foreign currency receipts on capital account and a "successful" devaluation must improve the balance on goods and services by more than enough to cover this reduction. Such an improvement is more likely to add to aggregate domestic demand. It will necessarily do so if such capital inflows exactly cover the initial trade deficit. This can be seen by modifying relationship (1) to include capital inflows K .

$$(2) \quad \Delta(B+K) = r(1-k)\Delta D - kB - kK$$

If $K = -B$ initially, the last two expressions on the right cancel, and a successful devaluation requires $\Delta D > 0$. But such a devaluation would be undertaken only to build net reserves; continuing capital inflows do not usually cover the current deficit of a devaluing country.

If the capital inflow is fixed in terms of foreign currency, as is likely to be true for foreign aid receipts, then the earlier analysis holds, except to the extent that the larger domestic currency proceeds from the foreign aid stimulate correspondingly larger domestic expenditures. Thus the budgetary treatment of foreign aid counterpart funds and the closeness of the link between budgetary receipts and government expenditures are important considerations in assessing the impact of devaluation on domestic demand.

For multiple exchange rates and differential changes in rates, the simplicity on relationship (1) gives way to more complex relationships, but no new principles are introduced. If the devaluation affecting imports exceeds that for exports, devaluation is more likely to be deflationary, whereas the reverse is true if the devaluation for exports is greater than that applicable to imports.

This analysis assumes that the monetary authorities neutralize the domestic monetary effects of any balance-of-payments deficit, but that they do not offset the domestic monetary effects of the enlarged domestic currency absorption (e.g. by a government receiving foreign assistance) resulting from devaluation.

Appendix C

Price-Wage Spiraling

Devaluation will typically have secondary repercussions on other costs, thereby weakening--but rarely reversing--the effects of the devaluation on international cost competitiveness. Devaluation may thus stimulate some cost inflation, but the process will normally be self-limiting.

To see this, suppose that the direct and indirect importance of imports, import-competing goods, and exports in the cost-of-living index is m . A proportionate devaluation by k (measured in terms of dollars per unit of local currency) will, therefore, increase the cost-of-living index by $(\frac{k}{1-k})m$, on the assumption that world prices for the devaluing country's imports and exports are unaffected by the devaluation. (If world prices of the country's exports fall, or if the devaluation induces a drop in m , the increase in the cost of living will be correspondingly lower.)

Suppose further that "workers" respond to an increase in the cost-of-living by demanding a wage increase in proportion p and suppose that wages account, directly and indirectly, for a fraction w of total domestic costs. Then domestic costs will be increased by an amount $(\frac{k}{1-k})mpw$. But this will in turn raise the cost-of-living further, by an amount $(\frac{k}{1-k})mpw(1-m)$. The induced rise in cost-of-living will in turn set off another round of wage increases, and so on, ad infinitum. The ultimate increase in the cost-of-living (P) will be:

$$P = m\left(\frac{k}{1-k}\right) [1 + pw(1-m) + p^2w^2(1-m)^2 + \dots] = \left(\frac{k}{1-k}\right) \frac{m}{1-pw(1-m)}$$

This is an infinite series, but it does not result in an infinite increase in the cost-of-living so long as $pw(1 - m)$ is less than unity. If workers attempt to restore all of the loss in real income resulting from devaluation, $p = 1$, and if "workers" include not only wage-earners but also salaried persons, businessmen, rentiers, and government enterprises, w may cover the whole of domestic costs ($w = 1$). In this extremely unfavorable case, the only restraint on induced price increases is, ironically, the "import" content (including import-competing goods and exports) of the cost-of-living, for which by assumption domestic prices are unchanged after the devaluation to a new fixed exchange rate, since they are determined in the world market.

The working out of this ultimate increase in the cost-of-living will of course take considerable time, and it will not occur before other disturbances--good or bad harvests, changes in world prices, etc.--intervene.

The ultimate increase in costs (C) of tradable goods resulting from the devaluation will be:

$$C = \left(\frac{k}{1 - k}\right) \left[n + \frac{mpw_x}{1 - pw(1-m)} \right],$$

where n is the direct and indirect import content in exports and import-competing goods and w_x is the direct and indirect share of wages in their total (not merely domestic) costs. In general, n will not be the same as m . For simplicity, exports and import-competing goods have been lumped together.

It can be easily shown that so long as p is no greater than unity, C can never exceed the amount of the devaluation, $\frac{k}{1-k}$. But if $p = w = 1$ and $w_x = 1 - n$, the original price relationships between tradable and non-traded goods will be restored, and the devaluation will be thwarted. Put another way, to improve the trade balance, devaluation must cut the real income expenditure of some group, be it workers, capitalists, or government.

Under some circumstances p may exceed unity. This would be the case where some wage or profit increases were overdue but were restrained by law, custom, fear of public opprobrium, or for other reasons. Devaluation may then remove the restraint or provide a publicly acceptable occasion for ignoring it, even though the rise in import prices is not directly involved. Where this is the case, devaluation might actually weaken the devaluing country's relative cost position.

In all cases discussed here, substantial and generalized "wage" increases cannot be sustained without the tacit cooperation of the monetary authorities; they must supply additions to the money supply to support higher price and wage levels. But wage increases may take place initially without this tacit cooperation, thereby confronting the monetary authorities with a painful choice between supporting the wage and price increases to maintain employment levels or preserving monetary restraint with the consequence of higher unemployment.

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FOOTNOTES

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¹For a discussion of the "disequilibrium system" used by many less developed countries, see C. P. Kindleberger, "Liberal Policies vs. Controls in the Foreign Trade of Developing Countries," AID Discussion Paper No. 14, 1967, published in Theberge, J.D. (ed.), Economics of Trade and Development, Wiley & Sons, 1968.

²In Canada and Peru the exchange rate floated downward steadily for about a year, ending respectively in May 1962 and April 1959. In these two cases the "previous year" is assumed to be 1961 and 1958, respectively.

³Specifically, $X_j^* = \sum_i X_{ij} R_i$, where R_i represents the ratio of total imports of 3-digit commodity group i into the OECD countries in the year following devaluation to those of the preceding year, X_{ij} is the value of exports of i by devaluing country j in the year preceding devaluation, and X_j^* is the computed level of exports for j . This formulation automatically allows for any change in world prices for the export products of the devaluing countries.

⁴Income elasticities of demand for imports were taken from Hollis Chenery and Alan Strout, "Foreign Assistance and Economic Development," American Economic Review, LVI (September 1966), page 712, column b. For Canada, Iceland, and Spain they were computed from import-income relationships in the 1950's.

⁵Although it is pushing these data farther than they can bear, not least because of the differential changes in rates where multiple exchange rates were involved, it is possible to compute the price elasticities implied by the difference between computed and actual exports and imports by using the effective devaluations shown in Table 1 (without making allowance, however, for the effects on demand of domestic price increases). Where devaluation "worked" (assuring the right signs) these elasticities range from .02 to 1.54 on the export side, and from .08 to .94 on the import side. Significantly, they are all quite low, as would be expected in the period immediately following devaluation.

⁶For a country that cannot influence the foreign currency prices of its imports, the devaluation-induced deterioration in terms of trade will be $kh_x / (h_x + e_x)$, where k is the proportional devaluation applicable to exports, h_x is the price elasticity of domestic supply of exports, and e_x is the price elasticity of foreign demand for exports. The terms of trade will remain unchanged if h_x is zero or e_x is infinite; at the other extreme,

Footnote 6 continued:

the terms of trade will worsen by the full amount of the devaluation, k , if e_x is zero or h_x is infinite. This formulation neglects the impact on the terms of trade of devaluation-induced changes in the level of total demand, an impact which is likely to be negligible for the cases considered here.

⁷A more formal analysis of the conditions under which devaluation will be deflationary is given in Appendix B.

⁸In at least one case, South Vietnam in 1966, currency devaluation was undertaken specifically because of its expected deflationary impact, not to improve the balance of payments.

⁹A comparison of column 1 of Table 7 with column 2 of Table 2 indicates that in five of these 14 cases--Colombia (1962), Greece, Iceland (1960), and Korea (1961 and 1964)--the balance improved when measured in foreign currency, illustrating the intermediate case, discussed in Appendix B, where devaluation may improve the payments position yet still be deflationary.

¹⁰See Carlos F. Diaz-Alejandro, Exchange Rate Devaluation in a Semi-Industrialized Country, Cambridge: The M.I.T. Press, 1965; and Andreas S. Gerakis, "Recession in the Initial Phase of a Stabilization Program: The Experience of Finland," IMF Staff Papers, XI (November 1964), pp. 434-45.

¹¹Roberto Alemann, "Economic Development of Argentina," in Committee for Economic Development, Economic Development Issues, Latin America, New York, 1967, page 51.

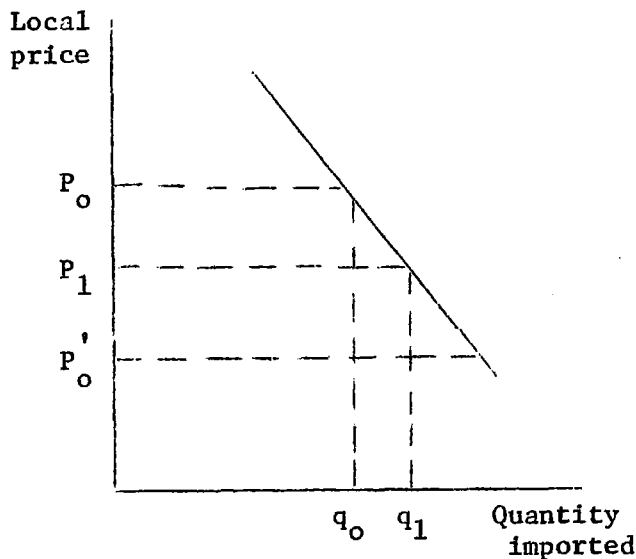
¹²The discussion usually focusses on increases in the local prices of imports. But the local prices of exports will also ordinarily increase, and where exports are staple consumption items, as with beef in Argentina or rice in Southeast Asia, this factor may have a greater effect on the cost of living than the rise in import prices.

¹³A more formal analysis of this proposition is given in Appendix C.

¹⁴Technically, spending could fall even with the maintenance of real incomes if national hoarding were to rise, an unlikely event except as a result of certain devaluation-induced redistributions of income, discussed in Section IV.

Total real income need not fall either if there are unemployed resources and output is responsive to devaluation. Even in this case, however, the real incomes of some employed factors may be expected to fall.

15. In partial equilibrium terms, these two points can be illustrated in the following diagram, showing the demand schedule for an imported product in the devaluing country. The initial exchange rate would lead to a domestic price P'_0 if the imports were unrestrained, but quotas limit imports to q_0 , permitting the importers to charge a domestic price P_0 . A devaluation by less than $1 - \frac{P'_0}{P_0}$ will raise the cost of foreign exchange to importers, e.g. to P_1 but with local competition it will result in no change in prices charged in local markets. Quotas hold the quantity of imports at q_0 . A devaluation by more than this amount will raise local prices above P_0 , but not by an amount proportional to the devaluation, and will reduce imports. If along with devaluation import quotas are also removed, and if the devaluation is less than $1 - \frac{P'_0}{P_0}$, local prices will fall to a point like P_1 , and imports will increase to q_1 . If the import is an intermediate product, this will lower the prices of competitively priced finished goods.



¹⁶This last development is said to have been important in Colombia in both 1962 and 1965. See John Sheahan and Sara Clark, "The Response of Colombian Exports to Variations in Effective Exchange Rates," Research Memorandum No. 11, Williams College, June 1967, mimeo.

¹⁷This percentage is related to that in Table 1 by the formula $k/(1-k)$, where k is the effective devaluation for imports. The difference arises because the figures in Table 1 reckon each exchange rate in terms of dollars per unit of local currency, whereas its reciprocal is relevant for indicating the increase in local currency prices of imports, dollar prices remaining unchanged.

¹⁸Regressions of prices on changes in the money supply alone resulted in a coefficient close to unity, but with very little of the cross-sectional variation explained.

It should be noted that the standard errors on the estimated coefficients for \dot{M} in both equations and for \dot{F} in the wholesale price equation are rather high, indicating low reliability in the relationship with these two variables. The constant terms are of no consequence.

¹⁹In Colombia the presidency alternates between the two leading parties every four years under a 1957 agreement; in Costa Rica quadrennial elections have always led to a change in government since the Second World War.

²⁰In Peru, the president is chief executive for a term of six years. However, he also appoints a prime minister to preside over the cabinet, which is responsible to the Congress, and President Prado appointed Pedro Beltran as prime minister and minister of finance in July 1961, charging him with straightening out the economic situation.

Appendix A

¹This notion of effective devaluation differs from another one sometimes used, viz., the nominal devaluation corrected for increases in domestic prices. While correction for increases in domestic prices is important in assessing the incentive effects created by devaluation, especially in countries with rapid price increases, such price increases are treated separately here.

²Evangelos Ap. Eliades, "Stabilization of the Greek Economy and the 1953 Devaluation of the Drachma," IMF Staff Papers, IV, (September 1954), pp. 51-52; and Schlome Riemer, "The Devaluation of the Israel Pound," Kyklos, XV (1962), Fasc. 3, pp. 657-670.

Appendix B

¹See my "Devaluation and Aggregate Demand," Yale Economic Growth Center Discussion Paper No. 55, June 1968, mimeo.