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Chapter 5

The Process of Devaluation

In the last chapter I dealt with the protective, discriminatory aspects of the Israeli exchange-rate system; in this chapter, I will analyze the macroeconomic aspects of changes in the foreign-exchange rate. I begin with a brief recapitulation of the main changes in the foreign-exchange rate during the period under review. This will be followed by an examination of the nature of the demand policies associated with each episode of devaluation. In connection with this, the relationship of the devaluation to local prices will be discussed and the extent to which nominal devaluations have also been "real" in the sense of changing the ratio of prices of tradables to local prices. Finally, the effectiveness of devaluation, in its impact on exports and imports, will be analyzed.

i. MAIN EPISODES OF DEVALUATION

Changes in the exchange rate, which have been mentioned often in earlier chapters, will be surveyed here in chronological order. It will be recalled, from the discussion of the last chapter, that for large aggregates the major part of the effective rate has always been the formal component. Likewise, major changes in effective rates have taken place through changes in the formal rate.

When the state of Israel was established, the Israeli pound (introduced in August 1948) was on a par with the pound sterling. A broken cross-rate system, however, was in existence, inherited from the last few years of the British mandatory regime: while the rate of exchange between the dollar and the pound sterling implied a cross rate of about IL 0.250 to the dollar (some-

what above $4 per pound), the direct rate of exchange between the Israeli pound and the dollar (and the implied rates with a few other hard currencies) was about IL 0.333 to the dollar ($3 per pound). With the British devaluation of September 1949, the Israeli pound remained on a par with sterling, and the rate of exchange with the dollar was made equal to that of sterling—IL 0.357 per dollar ($2.80 per pound). Thus, the changes in September 1949 left the rate of exchange of the Israeli pound against some currencies (mainly sterling) unchanged, but against some other currencies (primarily the U.S. dollar) the pound was devalued by about 7 per cent.

The next formal change in the rate of exchange took place in 1952. On February 14, 1952, the New Economic Policy was announced, the most important component of which was a progressive and rapid increase of the foreign-exchange rate, which was started on that same date. A multiple formal exchange-rate system was introduced: the rate of IL 0.357 per dollar (referred to from then on as rate A) was maintained as the official rate, but was made applicable to only a small category of transactions. Most transactions were to be conducted at two higher rates, one (rate B) twice the lower rate (i.e., IL 0.714 per dollar) and the other (rate C) IL 1.000 per dollar. Throughout 1952, transactions were gradually shifted from lower to higher rates (i.e., from rate A to rate B, and from the latter to rate C), until in early 1953 the large majority of transactions were conducted at rate C. In April 1953 a still higher rate, IL 1.800 per dollar, was added. The rate was formally established by adding IL 0.800 per dollar to rate C as a premium for exports and a levy on imports. Again, transactions were progressively and rapidly shifted to this higher rate until, by the end of 1953, this rate applied to most transactions. In December 1953 the two lowest rates, A and B, were formally abolished; rate C, IL 1.000 per dollar, was declared the new official rate, although by that time only a minority of transactions were conducted at this rate. In August 1954 rate C was also abolished, and only the higher rate of IL 1.800 per dollar remained, although it was not formally established as the official rate until July 1955.[1] From then on, a single-rate system again prevailed, with the next formal devaluation coming only in 1962.[2] By and large, the process of devaluation was complete within about two and a half years—from early 1952 to mid-1954. To recapitulate, during that period the formal rate was raised from IL 0.357 per dollar to IL 1.800 per dollar, a devaluation of just over 400 per cent; that is, the rate increased fivefold.

In February 1962 came the next episode of formal devaluation: the rate of exchange was raised from IL 1.80 to IL 3.00 per dollar,[3] an increase of two-thirds. As was mentioned in Chapter 3, much of the change introduced by this devaluation resulted in a unification of the effective-rate system—the lowering of the degree of dispersion introduced into the system by its non-formal components—rather than an increase in the aggregate level of the ex-

change rate. The net devaluation amounted to about 37 per cent in imports, and a mere 13 per cent in exports, compared with the gross (formal) devaluation of 67 per cent. To the extent that a net devaluation did take place, it was apparently motivated not so much, if at all, by any current pressure on the balance of payments, as by anticipations of adverse developments in the future. A large fraction of the country's capital imports was expected to disappear soon, since reparations payments from Germany were to be completed in 1963, and personal restitution payments were also expected to decline (an assumption that has proved to be wrong); at the same time, the economy's excess demand for imports (over exports) was expected to increase with the economy's growth. The devaluation was thus considered a preventive measure, in contrast to the devaluation of 1952–54, which was made under urgent and severe pressure. This difference in motivation may at least partly explain the difference in the policies accompanying the two episodes (see section 2, below).

Following the 1962 devaluation, the formal rate was maintained for close to six years, until November 1967, when the Israeli pound was devalued in the same proportion as the devaluation of the pound sterling: the rate of exchange was raised from IL 3.00 to IL 3.50 per dollar. This was, then, a devaluation of close to 17 per cent against the dollar (and most other currencies), but the previous rate was maintained against the pound sterling (and the few other currencies which followed it). The next and last formal devaluation, at this writing, came in August 1971, following by a few days the Nixon announcement of severance of the formal connection between the dollar and gold. The rate was raised then from IL 3.50 to IL 4.20 per dollar, an increase of 20 per cent. Since the dollar itself was devalued against most other currencies, during the few months which culminated in the Smithsonian Agreement of December 1971, this meant a somewhat higher devaluation of the Israeli pound against major currencies other than the dollar.[4]

As has been pointed out in the last chapter, the main quantitative importance of the nonformal component of the effective exchange rate in its aggregate effect was apparent during the long period of close to eight years, from 1954 to February 1962, during which the formal rate remained constant. During those years, the effective rates, particularly in exports, increased gradually through changes in the nonformal component. Likewise, it should be recalled, the net devaluation in February 1962 was substantially smaller than the gross devaluation—again, particularly in exports—owing to the reduction in the informal components of the rate of exchange (export subsidies and import duties) which accompanied the formal devaluation. To some extent, a similar process can be observed between the devaluation of 1962 and that of 1967, and again between the latter and the devaluation of 1971. Since 1954, thus, the process of net devaluation was more gradual (and also, as a trend,

TABLE 5-1

Formal and Effective Exchange Rates, 1949–71

(annual averages)

	Israeli Pounds per Dollar							
	Formal Rate		Effective Rate		Annual Percentage Increase of:			
Year	Exports (1)	Imports (2)	Exports (3)	Imports (4)	Col. 1	Col. 2	Col. 3	Col. 4
1949	0.34		0.35	0.39				
1950	0.36		0.39	0.40	5.0		9.4	4.1
1951	0.36		0.41	0.40	0		5.7	−1.7
1952	0.70	0.69	0.81	0.81	96.6	94.4	98.3	103.8
1953	1.16	0.83	1.28	1.17	65.7	19.6	58.1	45.0
1954	1.66	1.51	1.73	1.80	43.0	81.4	35.3	52.4
1955	1.80		1.83	2.21	8.2	19.5	5.8	22.9
1956	1.80		2.05	2.26	0		12.1	2.3
1957	1.80		2.21	2.33	0		7.8	9.2
1958	1.80		2.37	2.35	0		7.2	0.7
1959	1.80		2.49	2.50	0		5.0	6.5
1960	1.80		2.58	2.57	0		3.6	2.5
1961	1.80		2.66	2.60	0		3.1	1.4
1962	3.00[a]		3.02	3.47	67.0		13.0[b]	37.1[b]
1963	3.00		3.04	3.49	0		0.7	0.6
1964	3.00		3.06	3.47	0		0.7	−0.6
1965	3.00		3.08	3.55	0		0.7	2.3
1966	3.00		3.27	3.59	0		6.1	1.1
1967	3.00[c]		3.57	3.68	0		9.1	2.5
1968	3.50		4.04	4.13	16.7		13.1	11.6
1969	3.50		4.05	4.22	0		0.2	2.2
1970	3.50		4.49	4.42	0		10.7	4.8
1971	3.75[d]		5.04	5.09	12.9		12.2	15.2

SOURCE: See Table 4-9.

a. Effective in February; until then, the rate was IL 1.80 per dollar.

b. Since the sources for the effective rate in columns 3 and 4 change after 1962, the rates of change are based on the 1962 data from the earlier source: IL 3.00 per dollar for exports and IL 3.57 per dollar for imports.

c. Effective through November 19, after which the rate became IL 3.50 per dollar.

d. The rate was IL 3.50 per dollar until August 21; it has been IL 4.20 per dollar since then.

somewhat more substantial) than the process of gross (formal) devaluation. The formal and the effective rates for the whole period 1949–71 are presented as annual averages in Table 5-1.

ii. DEMAND POLICIES ACCOMPANYING DEVALUATION

Under conditions of full employment—or at least when unemployment is structural, and the national product is at its short-term ceiling—the impact of devaluation on exports and imports and on the import surplus is dependent on the degree of restrictiveness or expansiveness of the demand policy which accompanies the devaluation. By and large, conditions of full employment have indeed prevailed in the Israeli economy. To examine the likelihood of success of the devaluation process in Israel, the demand policy accompanying it must therefore be investigated. I shall focus on a few main variables of monetary policy, primarily on the money supply,[5] and on the public sector's excess demand for goods and services as an indicator of the direction of fiscal policy.[6] Attention will be paid mostly to the two episodes of substantial formal devaluation: the progressive devaluation of 1952–54 and the devaluation of February 1962. The rest of the process of devaluation will be mostly ignored, for two reasons. First, in Israel, no substantial devaluation has ever been performed over a short period through changes in the nonformal component of the rate. Thus, the examination of demand policy would be fruitful only for periods of formal devaluation. Second, the two later episodes of formal devaluation are less interesting than the earlier ones. The devaluation of November 1967 was not only minor (close to 17 per cent for the formal rate, and only some 12–13 per cent for the effective rates for exports and imports), but it was undertaken while the economy was still in recession (and following the impact of substantial budgetary expansion due to the Six-Day War). Therefore, it was both atypical of the Israeli economy and difficult to analyze. The latest devaluation episode, that of August 1971, is probably still too recent to analyze. Besides, it was again of much smaller proportions than the devaluations of 1952–54 or even that of 1962: it amounted to an increase of only some 12–14 per cent in the effective rates.

Table 5-2 contains data for the major monetary-fiscal variables during 1949–56, that is, the devaluation years 1952–54 as well as a few years preceding and following them. In column 3, the increase in the government's combined domestic and external debt stands as a proxy for the government's excess demand for goods and services, of which no direct estimate is available.[7] Column 4, which shows this magnitude as a percentage of the GNP, is probably a better indication of the expansive or restrictive impact of the gov-

TABLE 5-2

Major Monetary-Fiscal Variables, 1949–56

Year[a]	Increase in Government Debt (IL millions)			Column 3	Increase During the Year (per cent)	
	Internal Debt (1)	External Debt (2)	Total of (1) + (2) (3)	as Percentage of GNP (4)	Money Supply (5)	Credit to Public (6)
1949	50.1	19.2	69.3	20[b]	39.1	37.8
1950	65.4	22.6	88.0	19.2	35.4	42.3
1951	33.0	43.1	76.1	10.9	27.2	28.9
1952	8.8	62.1	70.8	6.8	6.5	23.5
1953	19.6	128.5	148.1	11.3	24.5	38.0
1954	44.8	234.1	278.9	16.2	20.1	13.1
1955	49.5	224.9	274.4	12.9	20.4	10.8
1956	154.7	220.5	375.2	14.7	23.2	18.7

SOURCE:

Col. 1—From *Statistical Abstract of Israel*, 1961, pp. 424–425 (excluding compulsory loan).

Col. 2—From *Statistical Abstract of Israel*, 1953–54, pp. 188–189, and ibid., 1956–57, p. 213, including, among others, unilateral receipts from the U.S. government and from German reparations.

Col. 4—GNP data (current prices) from Nadav Halevi and Ruth Klinov-Malul, *The Economic Development of Israel* (New York: Praeger, 1968), App. Table 1.

Cols. 5 and 6—From Don Patinkin, *The Israel Economy: The First Decade* (Jerusalem: Falk Project for Economic Research, 1959; in English), App. B, pp. 142–143.

a. Data on government debt (columns 1, 2, and 3) are for fiscal years (April to March); GNP (denominator for column 4) and monetary data (columns 5 and 6) are for calendar years.

b. Rough approximation.

ernment's excess demand in a fast-growing economy such as Israel's—particularly at that time. It appears from column 4 that excess demand declined by about half from 1949 and 1950 to 1951, from a level of some 20 per cent to about 11 per cent of the national product. In 1952, it declined considerably further—to less than 7 per cent. In 1953, it increased to the level of 1951; but it was lower than in 1954–56, when it increased further to close to 15 per cent. It may be inferred, then, that fiscal policy turned contractionary in 1951, proceeded more intensively in that direction in 1952, and continued to be somewhat contractionary in 1953, compared to policy subsequently or before 1951. Since the fiscal data are for budgetary years, which run from April to March, April 1951 would appear to be the turning point toward a restrictive policy. In the absence of quarterly fiscal data, the actual turning point cannot be established, just as the turn upward toward expansion cannot be

dated precisely. But in rough terms, it may be said that fiscal policy became restrictive about half or three-quarters of a year before the start of the devaluation process (in February 1952), and remained so for about three years, turning upward by about mid-1954, a year before the end of the period of progressive devaluation.

Data on the money supply, in column 5, show roughly similar movements. The expansion of the money supply, which was very substantial in 1949–50, subsided somewhat in 1951, and declined sharply in 1952. In this case, quarterly data (not shown) permit a more precise dating of events. A radical slowdown—almost a halt—of the expansion of the money supply, occurred abruptly in the third quarter of 1951. The near-freezing of the money supply lasted through 1952. In early 1953, the money supply started again to expand at a substantial rate—not quite as rapidly as before mid-1951, but at about the same rate as through the following years, 1954–56. Thus, the contraction in the rate of expansion of the money supply began about four or five months before the start of the process of devaluation, and lasted for about a year and a half.

Monetary change in this period was due primarily to two factors. One was the reduction in the government's borrowing from the banking system, which was associated with a reduction of the government's excess demand. This reduction may be seen in the data on the government's internal debt (column 1), the overwhelming component of which was debt to the banking system. This borrowing declined in 1951, was negligible in 1952, and remained low in 1953. An important step in this direction was taken in June 1952, on the occasion of a currency conversion: a 10 per cent tax was imposed on almost all money (cash and demand deposits) held by the public. The other important source of change was the development of bank credit to the public (total credit of the commercial banking system other than to the government). As may be seen from column 6, the rate of expansion of credit to the public declined from a level of about 40 per cent per year during 1949–50 to about 25 per cent during 1951–52 (the change in pace occurring, again, in about September 1952 and the reverse change in the spring of 1953). The amount of credit was supposedly controlled by reserve ratio requirements, which were extremely high (90 per cent at the margin, i.e., on deposits added after a given base date); but banks could lend "beyond the reserve requirements" [8] by governmental authorization, and credit was extended mostly by this means. The new expansion of credit that began in early 1953 was the main factor in the increase in the rate of expansion of the money supply at that time, whereas the accumulation of foreign-exchange reserves explains the expansion of money supply in 1954, when expansion of bank credit to the public as well as to the government was again modest.[9]

It appears then that for about a year and a half or two years, from the

summer or fall of 1951 to the spring or summer of 1953, fiscal and monetary policies were restrictive—even highly so, in comparison with preceding years. Such policies were, indeed, specifically included in the New Economic Policy declared in February 1952, along with the first step of the devaluation process undertaken then. As may be seen, the restrictive demand policy even preceded the devaluation by about half a year and was thus announced when it was already in force.[10] This restrictive policy lasted for about a year or a year and a half after the start of the devaluation process, and was reversed—although without its returning to the expansionary proportions it had assumed prior to mid-1951—before the final stages of the devaluation process were completed.

In Table 5-3, the monetary-fiscal variables are presented for the two years, 1960 and 1961, preceding the devaluation of February 1962, as well

TABLE 5-3

Major Monetary-Fiscal Variables, 1960–66

	Increase During Year (per cent)			Excess Demand of Public Sector	
Year	Money Supply (1)	Foreign Assets[a] (2)	Credit to Public (3)	IL Millions (4)	Percentage of GNP (5)
1960	21.3	63.7	21.9	193	4.4
1961	10.1	34.1	18.3	175	3.3
1962	29.7	138.8[b]	27.4[b]	430	6.8
1963	28.1	18.0[c]	19.7	381	5.1
1964	6.1	2.8	15.7	356	4.1
1965	11.2	14.3	12.5	452	4.4
1966	5.7	−4.0	23.7	688	6.0

SOURCE:

Cols. 1–3—From Bank of Israel, *Annual Report*, 1965, 1966, Table XV-1.

Col. 4—From ibid., 1963, 1965, 1966, Table VII-1.

Col. 5—GNP data in current prices from Halevi and Klinov-Malul, *Economic Development of Israel.*

a. Underlying data valued in Israeli pounds.

b. These rates of change reflect, among other things, the increase in the value of foreign assets and foreign-exchange-rate-linked public credit resulting from the February 1962 devaluation. Excluding this effect, the rates of change for 1962 would be 76.4 per cent (column 2) and 16.2 per cent (column 3).

c. In part, this reflects the effect of an extensive prepayment of government external debts, financed by a special borrowing from the Bank of Israel of IL 148.7 million. Were this magnitude to be added to external assets, the increase in column 2 in 1963 would have been 29.8 per cent.

as the five years, 1962–66, following it. The impression gained from these data stands in striking contrast to that which has emerged from the analysis of the earlier devaluation episode: the devaluation of 1962 seems to have been accompanied by *expansive* (or increasingly expansive) demand policies, rather than by contractionary (or decreasingly expansive) policies. The annual rate of expansion of the money supply (column 1) approached 30 per cent during 1962 and 1963, the two years following the devaluation, far exceeding the rates of expansion in either the preceding or the following years; indeed, one has to go as far back as 1950–51 or as far forward as 1971–72 to find similar rates of increase of the money supply. The excess demand of the government for goods and services (column 4) as a percentage of GNP (column 5) was twice as high in 1962 as in 1961. In 1962 and 1963, this magnitude was considerably higher than in the two preceding or two following years. Judged by this measure, fiscal policy, too, became expansive in the period following devaluation.

As has been mentioned earlier, the basic difference between the two episodes of devaluation probably lies in the motivation for each. In 1952–54, the government felt the urgent need for contractionary demand policies both because foreign-exchange reserves were totally exhausted, and because inflation had led to the feeling of a complete breakdown of the system of management of the economy: it was obvious that a concerted effort was required to deal with these two problems. In 1962, no similar stresses were apparent: foreign-exchange reserves were high and still rising, and the rate of inflation in preceding years, although somewhat higher than in the late 1950s, was not felt to be a serious threat to the orderly running of the economy.

On that score, moreover, it is very likely that the expansionary fiscal policy in 1962–63 was at least partly due to the fear of price increases and to a misconception about the source of such increases and the manner of combating them. From the circumstantial evidence available for the period, it appears that the government saw the process of price increases as originating not from excess demand in the economy, but from cost increases. Budgetary policy was thus directed toward the goal of creating offsetting pressures from the cost side. This was done by lowering (or refraining from raising) taxes on various expenditures and by granting subsidies. These steps contributed, in turn, to the increase in the government's excess demand.

The expansionary monetary policy which followed the devaluation of 1962 may be explained primarily by the dominance of foreign assets in the determination of monetary developments, a dominance which was almost entirely absent in the first half of the 1950s. As may be seen from Table 5-3, columns 2 and 3, the rate of expansion of bank credit to the public was much more stable, over the years covered in the table, than the rate of expansion of the banking system's foreign assets, and the variation in the rate of expansion

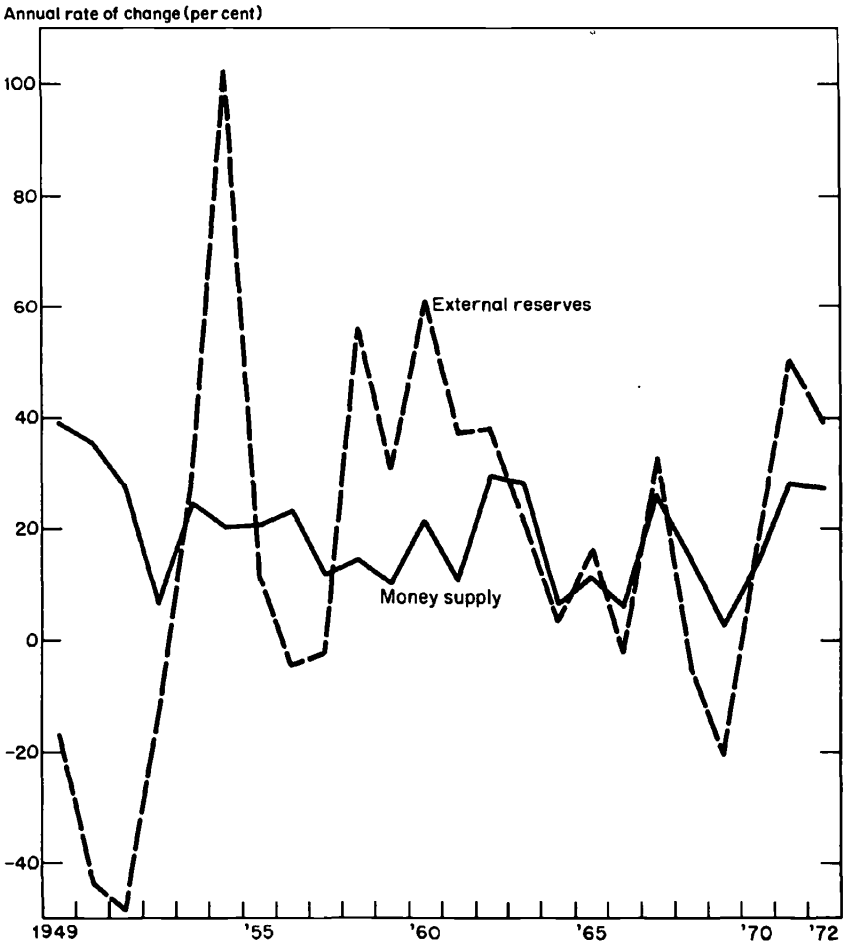
of the money supply seems to be closely related to fluctuations in the size of foreign assets.

In Chart 5-1 the relationship just described may be observed over the whole period, 1949–72. No association between external reserves and the money supply may be traced before 1957. Indeed, reserves during the first half of the 1950s were so low that even large fluctuations in their rate of change would not have been very significant. Beginning in 1957 or 1958, however, the rates of change of the two move together: practically without exception, the rate of change of the money supply rises and falls with the rate of change of the country's external reserves (the latter being itself negative as well as positive).[11] In this sense, monetary policy in Israel appears to adhere closely to the classical gold-standard "rules of the game." This adherence may be explained by a number of factors. One would be an active compliance with the rationale of the rules, namely, a recognition that monetary policy should be expansive when the country's foreign assets grow, and contractionary when foreign assets fall. While such a recognition may have played a role once in a while, it has not presumably been the main factor in the explanation of the phenomenon at hand. More probably, the explanations lie in the technique and manner of conduct of monetary policy in Israel. The Bank of Israel has not usually attempted—either because it did not wish to do so or because it assumed it was not able—to change the rate of expansion of credit to the public enough to offset the effect of fluctuations in the country's external assets; to do so would sometimes have meant actually contracting the supply of this credit.[12] Rather, the policy of the Bank of Israel was most often aimed at achieving a roughly stable rate of expansion of bank credit, thus avoiding only the secondary effect of fluctuations of external assets through their impact on the liquid assets of the banking system. Of at least the same importance, however, has been the large measure of inflexibility in the conduct of monetary policy due to the techniques used. Open-market operations, or their equivalent, are only a recent phenomenon in Israel; and even now, in the early 1970s, they are still conducted on a modest scale. From the late 1950s to the late 1960s (and to a large extent also in the 1970s), the major instrument of monetary policy was minimum reserve requirements. Due to the complexity of the decision-making machinery, moreover, this instrument was not used very frequently: the frequency could be stated in years, or half-years, rather than in weeks. As a result, any discretionary change by the Bank of Israel was time-consuming and involved a long lag. Automatic factors, chiefly fluctuations of foreign-exchange reserves, thus played a major role.

To all of these elements should be added the fact that most aspects of foreign-exchange policy are not handled by, or coordinated with, the monetary authority. The large accumulation of foreign-exchange reserves in 1962 resulted partly from the initiative of individuals (including firms and banks),

CHART 5-1

Money Supply and External Reserves, 1949–72



SOURCE:

External reserves—Table 2-2. Note that "foreign assets" in Table 5-3 refer to the Bank of Israel only, and are valued there in Israeli pounds.

Money supply—From Don Patinkin, *The Israel Economy: The First Decade* (Jerusalem: Falk Project for Economic Research, 1959; in English); Bank of Israel, *Annual Report*, various years.

many of whom had anticipated the devaluation and delayed capital transfers to the country until afterward. But at the same time, the Treasury was actively engaged in encouraging, securing, promoting, and guaranteeing a variety of forms of short- and medium-term capital transfers to Israel, disregarding completely the impact of such transfers on monetary developments and on demand in the economy.

In light of the association discussed here, it is interesting to digress, for a moment, from the analysis of the devaluation of 1962 and to turn to the recession which followed it by a few years. This recession, the only one in Israel since 1953, started at about the fall of 1965 and reached its lowest point at the end of 1966, the upturn apparently beginning in the first quarter of 1967. The recession is usually referred to—most of all by the policymakers themselves—as resulting from a deliberate policy initiated by the government partly in response to the "failure" of the 1962 devaluation: recognizing that expansionary demand policy was to blame for the absence of the expected improvement in the balance of payments after devaluation, so the argument goes, the government decided to revert to a contractionary policy. A glance at Table 5-3 and Chart 5-1 would not, however, support this contention. Excess demand of the government, as a proportion of GNP, appears to have been slightly higher in 1965 than in 1964, and considerably higher in 1966; thus, at least so far as this measure is concerned, the recession cannot be attributed to a change in fiscal policy. On the other hand, the rate of expansion of the money supply appears to have been substantially lower in 1964, 1965, and 1966 than in earlier years;[13] and this corresponds closely to the change during those years in foreign-exchange reserves, whose rate of increase declined radically. It is true that in 1964 and 1965 expansion of banking credit to the public also slowed down; but this cannot be attributed to the implementation of a discretionary policy by the Bank of Israel, since it took no contractionary measures in these years. The slowdown of credit expansion may thus be reasonably interpreted as an automatic response of the banking system to the decline in the rate of expansion of its liquid assets resulting from the slowdown in foreign-exchange accumulation. Only in 1966 did the Bank of Israel take discretionary measures (considerably reducing reserve ratio requirements and increasing the amount of its rediscounting), which succeeded in overcoming this secondary impact, leading to a substantial expansion of credit despite the decline of foreign-exchange reserves in that year. If this interpretation of the data is correct, the recession would appear to have been an automatic response of the economy to the slowdown—virtually, in fact, a complete cessation—in the accumulation of foreign assets, rather than the result of discretionary government policy. Even so, it might of course still be argued, perhaps correctly, that the government could have counteracted this automatic development by a more expansionary policy than it actually under-

took, or by a more rapid one, and that the failure to do so indicates that the contractionary development seemed desirable to the government.

Turning back to monetary developments following the devaluation of 1962, another important element, also related to foreign assets, should be pointed out. It will be recalled that, starting in 1957, recipients of personal restitution payments from Germany have been entitled to retain a portion of their receipts in two forms of foreign-exchange deposits—either deposits out of which foreign exchange may actually be withdrawn or deposits denominated in foreign exchange, the value of which in Israeli pounds is thus linked to the rate of exchange (see Chapter 4). At first, these accounts were of minor importance. But with time, as the size of restitution payments expanded and past accumulations of these deposits kept growing, foreign-exchange deposits assumed significant proportions. This may be seen in Table 5-4, in which these deposits are presented both in absolute values in terms of the Israeli pound (column 1) and in relation to the size of the money supply

TABLE 5-4

Foreign-Exchange Deposits of Local Residents, 1957–71

Year	End-of-Year Value (IL mill.) (1)	Ratio to Money Supply (per cent) (2)	Ratio to Annual GNP (per cent) (3)
1957	23	3.9	0.8
1958	38	5.8	1.1
1959	85	11.7	2.2
1960	174	19.8	4.0
1961	247	25.5	4.7
1962	547	43.5	8.7
1963	633	39.3	8.4
1964	780	45.7	8.9
1965	965	50.8	9.2
1966	1,124	56.0	9.8
1967	1,601	63.1	13.4
1968	1,924	66.4	13.7
1969	2,498	84.1	15.7
1970	3,000	88.7	16.3
1971	4,783	110.2	21.0

SOURCE:

Col. 1—Derived from balance sheets of Bank of Israel, in Bank of Israel *Bulletin*, various years.

Cols. 2 and 3—See Source note to Table 5-3 for columns 1 and 5. GNP data for 1967 and after from Bank of Israel, *Annual Report*, various years.

(column 2) and annual GNP (column 3). In the late 1950s, the foreign-exchange deposits were still of minor importance. But throughout the 1960s they grew very rapidly. By the end of 1971, they were larger than the money supply and equal to more than 20 percent of the national product in that year.

A formal devaluation automatically increases the local-currency value of the foreign-exchange deposits by the proportion of the devaluation. This has an expansionary effect in three interrelated ways. First, this part of the wealth of holders of foreign-exchange deposits increases by the given proportion,[14] thus leading presumably to increased consumption expenditures. Second, it is the liquid part of wealth that increases; those with no desire to raise the proportion of their liquid assets would shift their holdings to real assets, thus adding another expansionary factor. And third, since these expenditures entail the conversion of foreign-exchange deposits into local-currency deposits, they raise the liquidity of the banking system, thus increasing its capacity to expand credit to the public.[15] These factors would be strengthened when the devaluation had been long anticipated, and when no further devaluation was expected in the near future.

At the time of the February 1962 devaluation, this element was already of considerable importance. As may be gathered from the data in Table 5-4 for the end of 1961, the formal devaluation of some 67 per cent (from IL 1.80 to IL 3.00 per dollar) raised the size of the inventory of foreign-exchange deposits by a value equivalent to about 15 per cent of the money supply, or 3 per cent of the 1961 national product. It is probably not feasible to give a quantitative estimate of the direct impact of this increase on demand in the economy. However, an estimate is available of the probable effect of this element on conversion of foreign-currency deposits into local-currency deposits.[16] This conversion is assumed to be a function of the inventory of existing foreign-exchange deposits and of current receipts of restitution payments. When a multiple regression function was fitted using predevaluation data, the rate of conversion into local currency in 1962, the first year following the devaluation, was found to be only slightly higher than "normal." In 1963, on the other hand, it was substantially higher and became a major factor contributing to the expansion of the money supply. Apparently, the effect of devaluation on the rate of conversion was delayed, partly (as would seem from other indications) because at first some expectations of a further devaluation were entertained.

It should also be noted that when foreign-exchange reserves rise—as they did in 1962 and 1963—the formal devaluation increases the local-currency value of the addition to reserves. This is another expansionary monetary factor, contributing again to the automatic expansionary effect of the devaluation on monetary developments.

An understanding of the role of foreign assets and foreign-exchange-de-

nominated assets thus helps to explain the contrast between monetary policy and performance following the 1952–54 and 1962 devaluations. In the earlier episode, foreign assets had been nil before the devaluation, and remained so for the two years following it. At the time of the later devaluation, on the other hand, foreign-exchange-linked assets were substantial; and the country's external reserves kept growing rapidly after the devaluation. The automatic expansionary effect on the economy's liquidity was thus substantial in the devaluation of 1962. The growing importance of foreign and foreign-exchange-linked assets has been an added constraint on the use of monetary policy since the late 1950s. The knowledge that, owing to the strong automatic expansionary effect of these assets, a devaluation would require a more strongly contractionary fiscal and credit policy than otherwise has probably served as an additional source of resistance to the use of changes in the foreign-exchange rate as a policy instrument.

iii. THE FOREIGN-EXCHANGE RATE AND DOMESTIC PRICES

To affect decisions by economic units, changes in the foreign-exchange rate must be *relative* to the price level maintained in the local market: to reduce imports and raise exports, the foreign-exchange rate must rise more (or fall less) than prices of home products in sales to the local market. This, indeed, is the other side of the demand policy discussed in the preceding section. Under circumstances of full employment, local prices will tend to rise more after devaluation, the more expansive demand policy is. These prices are then more likely to rise by as much as (or even more than) the increase in the rate of exchange resulting from devaluation, thus tending to cancel the tendency toward an increase in the relative price of exports and imports versus prices in the home market.

One difficulty encountered in examining price changes following devaluations in Israel is that during at least part of the period of most intensive devaluation, 1952–54, available price indexes are only a poor guide to actual price changes. It will be recalled that controls, rationing, the use of the black market, and the level of black-market prices all reached their peaks at the time of the devaluation of 1952. Official price indexes, on the other hand—the only ones available—reflected only legal ceiling prices. These indexes show a combined increase of the consumer's price index of only about 10 per cent from the end of 1948 to the end of 1951, a figure which evidently bears only little resemblance to actual price increases in the domestic market (including its nonsanctioned sector). Some indication of what prices might have been in a free market may be obtained from monetary data. From the end of

1948 to the end of 1951, the money supply increased by about 140 per cent. Income and product data are available only from 1950 on. From 1950 to 1951, GNP in constant prices increased by about 25 per cent.[17] It is usually assumed that the national product increased at a slower rate in earlier years. Therefore, over the period from late 1948 to late 1951, GNP may have increased by about 70 to 75 per cent. Consequently, assuming equilibrium prices in 1948, a strict quantity theory applied to income data would thus have yielded a figure for the increase in the general price level over those three years of about 40 per cent, that is, roughly 30 per cent more than the 10 per cent shown in the cost-of-living index. With the devaluation of 1952, it will be recalled, a process of gradual liberalization and removal of controls and rationing was begun. In 1954, at the end of the period of progressive devaluation, the scope of the black market had greatly declined, and differences between its prices and the prices recorded in constructing the official indexes were not radical. Thus, the increases for 1952–54, and perhaps shortly after, shown by such price indexes (primarily the cost-of-living index, which served to measure consumption prices) are *overstatements* of actual price increases, since black-market prices rose much less than official prices and sometimes even declined. In other words, the recorded price increases of 1952–54 actually reflect also the unrecorded price rises (estimated, in the rough exercise above, at 30 per cent) of the preceding years.[18] This should be borne in mind in analyses involving price data for those years.

Table 5-5 and Chart 5-2 present the time path of movements of the foreign-exchange rate and of local prices. In Chart 5-2, annual averages of the effective rate of exchange, the index of consumer prices, and the index of the GNP price deflator are shown. The effective rate is calculated as an average of export and import rates weighted by the annual amounts of imports and of value added in exports. Table 5-5, on the other hand, contains quarterly[19] data on the rate of foreign exchange and on the index of consumer prices for three selected periods in which the main devaluation episodes took place: 1952–56, 1962–65, and 1967–71.

The contrast between the period of progressive devaluation, 1952–54, and the period following the devaluation of February 1962 is striking. During 1952–54 the domestic price increase, although substantial, was far below the increase in the rate of exchange. In fact, only by the end of 1970 did local prices rise above their 1951 level to the same extent as had the rate of exchange by the end of 1954. At the latter date the increase in domestic prices over the 1951 level was only about one-fourth as much as the increase in the rate of exchange. This lag of movement of local prices behind the exchange rate is all the more remarkable in view of the preceding comment on the strong upward bias involved in the use of official price indexes for the years 1952–54.

TABLE 5-5

Effective Exchange Rates and Consumer Prices, Quarterly Data for Selected Periods, 1952–71

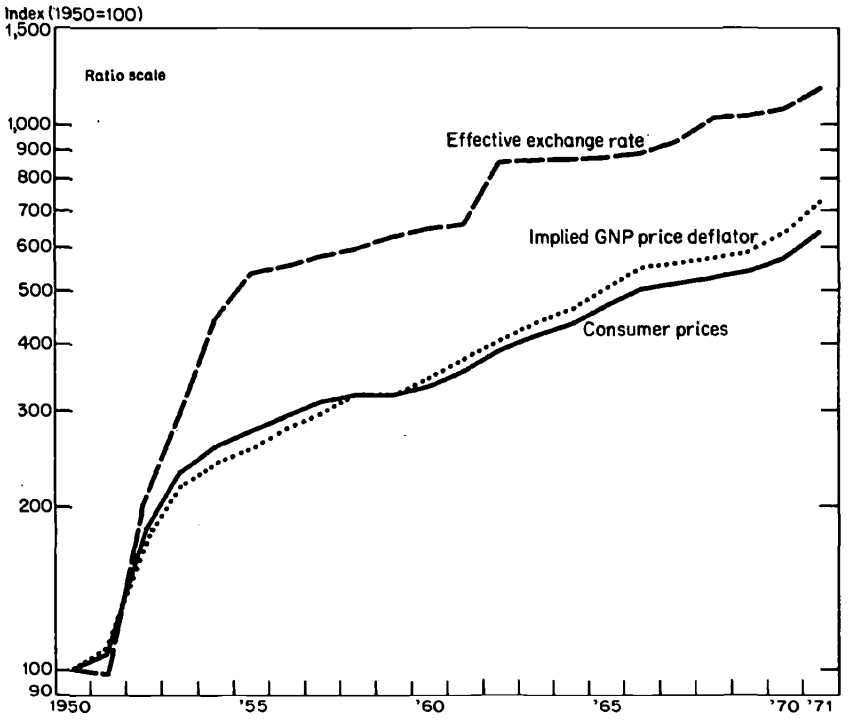
1952–56 (end 1951 = 100)			1962–65 (end 1961 = 100)			1968–71 (end 1967 = 100)		
Year and Quarter	Effective Rate	Consumer Prices	Year and Quarter	Effective Rate	Consumer Prices	Year and Quarter	Effective Rate	Consumer Prices
1952 I	129	116	1962 I	130	103	1968 I	113	102
II	195	143	II	130	105	II	113	103
III	232	157	III	130	106	III	113	102
IV	246	168	IV	130	111	IV	114	102
1953 I	215	174	1963 I	130	112	1969 I	114	103
II	276	183	II	130	112	II	115	105
III	311	193	III	130	113	III	115	104
IV	324	199	IV	130	116	IV	115	106
1954 I	370	206	1964 I	130	118	1970 I	119	106
II	433	206	II	130	118	II	119	110
III	504	211	III	131	119	III	134	111
IV	537	217	IV	131	121	IV	134	118
1955 I	548	217	1965 I	131	125	1971 I	134	121
II	560	220	II	132	129	II	134	124
III	563	223	III	132	128	III	153	125
IV	566	227	IV	132	131	IV	153	133
1956 I	570	229						
II	572	236						
III	577	238						
IV	582	240						

SOURCE: Consumer prices—*Statistical Abstract of Israel*, various years; "end of year" for 1951, 1961, and 1967 is average for last quarter of the year.

Effective rates—For 1952–54, import rate from Michael Michaely, *Israel's Foreign Exchange Rate System*, vol. II, *Tables* (Jerusalem: Falk Institute, 1968; in Hebrew); for 1955–56, import rate interpolated from annual data; for 1957–61, Tables 4-2 and 4-3, above; for 1962–65, weighted average of import and export rates (change in 1962 reflects the February 1962 devaluation; other data are annual); for 1968–71, weighted average of import and export rates. The base of the index for 1968–71 is the rate in 1967 through November 19. Changes took place in November 1967 (1968I), February 1970 (1970I), August 1970 (1970III), and August 1971 (1971III). Minor changes shown during 1968–69 are interpolations from annual data.

CHART 5-2

Effective Exchange Rate, Consumer Prices, and Implied GNP Price Deflator, 1950–71
(annual averages)



SOURCE:
Effective exchange rate—Weighted average of cols. 3 and 4 of Table 5-1, above.
Consumer prices and implied GNP price deflator—Table A-17.

In the period following the February 1962 devaluation, on the other hand, the lag of domestic prices was much briefer. By early 1964, domestic prices increased by about three-fifths of the degree of devaluation; and by mid-1965, they had increased in almost the same proportion. Since the time sequence does not indicate the functional relationship between the two variables—that is, the contribution of devaluation to the rate of increase of domestic prices—it cannot be inferred that the devaluation did not lead to a relative increase of the price of foreign exchange beyond this period of about three years: some domestic price increase would have most probably occurred

without the devaluation. In other words: the return of the relative price of foreign exchange to its predevaluation level within some three years does *not* necessarily mean that this policy act was meaningless beyond this period.

As may be judged from Chart 5-2, domestic prices and the rate of exchange showed similar increases during the long period extending from late 1954 until just before the formal devaluation of February 1962. Since changes in the effective rate were minor in those years, it would seem unreasonable to assume that they were the factor which determined the rate of increase of domestic prices. Insofar as a causal relationship existed here, it must have been in the opposite direction: the exchange-rate policy of the government during that period may have been intended to result in periodic changes of the effective rate in the same proportion as increases in domestic prices. On the other hand, in the sequence of changes in the rate from 1967 on, causal relationships probably ran in both directions: from price rises to changes in the rate of exchange and then in the opposite way. The devaluation of November 1967, coming when recession was still felt, left domestic prices almost intact. However, the effective devaluation of August 1970, the result of imposing the 20 per cent import duty, and the formal devaluation of August 1971, were followed within a short time by similar increases in local prices. This development would be clearly evident if preliminary data for 1972 were added. Here, too, it would be mistaken to conclude that these price rises—in whole or in part—would not have taken place without the devaluations. But like the episode of the 1962 devaluation, the behavior of local prices is consistent with the demand policy adopted, which was expansionary throughout most of this period.[20]

iv. THE EFFECTIVENESS OF CHANGES IN THE EXCHANGE RATE

In the preceding section the movement of domestic prices following devaluation and the relationship of devaluation to accompanying demand policies have been discussed. I now analyze the effect of *relative* changes in the foreign-exchange rate, that is, changes in the price-level-deflated effective exchange rate (PLD-EER), on the main balance-of-payments magnitudes of exports and imports.

Annual rates of change of EERs adjusted for purchasing power parity are shown in Table 5-6 for exports (column 2) and imports (column 4). The purchasing power parity (PPP) is the rate which would leave unchanged the price ratio of exports or imports to local sales of home-produced goods.[21] An increase in the PPP-adjusted exchange rate would thus mean a rise in the price of exports or imports in relation to the price of domestic goods; and a

TABLE 5-6

Relative Prices and Quantities of Exports and Imports, 1951–71
(annual percentage changes)

Year	Purchasing Power Parity (1)	Exports: PPP-adj. Effective Exchange Rate (2)	Exports: Quantity (net of change in GNP) (3)	Imports for Civilian Use: PPP-adj. Effective Exchange Rate (4)	Imports for Civilian Use: Quantity (net of change in GNP) (5)
1951	3.0	3.0	−8.1	−5.0	−18.6
1952	49.5	32.0	28.0	36.8	−19.9
1953	35.1	16.9	24.9	6.9	1.5
1954	6.7	27.0	15.4	44.6	−13.8
1955	0.5	5.0	−14.8	22.9	−7.1
1956	4.9	7.1	5.7	−2.8	−2.0
1957	0.9	7.0	10.9	2.5	0.6
1958	11.0	−3.3	1.9	−9.3	1.4
1959	6.5	−1.7	17.8	0	−3.7
1960	2.2	1.7	17.9	0.4	8.7
1961	10.2	−6.4	5.2	−8.0	12.8
1962	9.6	2.7	7.7	25.2	−0.1
1963	6.1	−4.9	6.0	−5.0	−5.5
1964	4.1	−3.3	−2.9	−4.5	11.4
1965	6.6	−5.8	2.0	−4.3	−10.0
1966	5.2	1.0	10.0	−4.0	−3.8
1967	2.8	6.1	7.8	0	−1.6
1968	3.2	9.5	12.1	8.8	21.2
1969	−1.5	2.2	−6.1	3.4	−0.6
1970	8.3	2.2	2.2	−3.4	3.3
1971	10.6	1.7	19.4	4.3	10.2

SOURCE:

Col. 1—See text note 21. P_H, domestic price level (implied GNP price deflator) is derived from GNP data at current and constant prices in *Statistical Abstract of Israel*, various years, and is shown in Chart 5-2. P_T, average price level of exports and imports, is computed from Table 6-6, column 2.

Cols. 2 and 4—From Table 5-1, columns 3 and 4, and changes in PPP estimates in column 1 above.

Cols. 3 and 5—Export and import data in dollars from *Statistical Abstract of Israel*, various years, deflated by corresponding price indexes in Table 6-5. GNP in constant prices, 1950–69, from Don Patinkin, "The Economic Development of Israel" (unpublished, 1970; in English), App. Table 7; 1970–71, from Bank of Israel, *Annual Reports*. See also accompanying text.

decrease in the adjusted rate would mean the opposite. Table 5-6 also contains annual rates of change of exports (column 3) and imports (column 5) *net* of the rate of change of the national product. In the case of exports, for instance, the change presented is the proportional increase in exports over (if the net change is positive) or below (if it is negative) the proportional change in GNP. It is implicitly assumed in such a presentation that in the absence of changes in relative prices, exports and imports would remain a fixed proportion of the national product, and deviations from these proportional changes may thus be associated with changes in relative prices. The export and import data refer to goods and services. However, imports exclude the purchases of defense material and equipment. These are roughly identified by the import item "government, n.e.s." in the services account of the balance of payments. Imports of military goods have been substantial and very volatile, and presumably depend little on price movements—at least in the short run and within a wide range of price changes. The inclusion of such goods in import data would thus be likely to yield misleading results when the impact of changes in relative prices on imports is analyzed.

In data such as those presented in Table 5-6, apparent associations of year-to-year movements of the variables cannot be expected to be very high even when the actual impact of one variable on the other is strong. This is due to the time lag which must exist in the response of quantity to prices and to the effect of using annual averages in the observations. It may be presumed that a full response requires much more than a single year for its manifestation, whereas comparisons of annual averages may not reflect even a large part of the impact that does take place within a single year (or may even, in extreme cases, point in a misleading direction). In addition, it should be noted from Table 5-6 that during most of the period the changes in the (adjusted) rates of exchange were quite mild. With minor changes in relative prices—just a few percentage points—random changes in exports and imports, as well as errors in measurement, become important relative to the impact of changes in relative prices, and the associations sought for inevitably appear weaker.

It is not surprising, therefore, that the data in Table 5-6 do not, for most of the period covered, suggest any clear association of price and quantity changes.[22] The outstanding exception is the period of the first half of the 1950s, in which the quantities of exports and imports seem clearly to respond to the price movements, which in this period were both large and consistent. During the three years 1952–54, the PPP-adjusted exchange rate increased at an average annual rate of 25.3 per cent, in comparison with an average increase of 1.3 per cent for all other years presented in Table 5-6. The average annual increase of exports (net of the change in GNP) was 22.8 per cent in the years 1952–54, versus 5.3 per cent for all other years. In 1952–55, the average annual change in the exchange rate for imports rose 22.8 per cent;

the quantity index fell 9.8 per cent. For the other years covered in the table, the exchange rate was unchanged and the quantity index rose 1.4 per cent.

This comparison yields the rough impression that relative-price changes of exports and imports do have an impact in the "right" direction on both exports and imports. Elasticities of supply of exports and demand for imports for Israel, developed on the basis of two recent studies, make it possible to carry the analysis somewhat further.[23]

Halevi's study[24] is concerned with both aggregate exports of goods, and, more particularly, with industrial exports (excluding diamonds), which since the late 1950s constitute the major category of exports, and are presumably more sensitive to price changes than any of the other export categories of goods.[25] Value added in exports, at constant prices, is shown in this study as a function of the relative price of exports (that is, the adjusted effective exchange rate for value added in exports) and the size of capital, which is taken as an indicator of productive capacity. For total exports of goods, the PPP-adjusted exchange rate, like the earlier figures shown, is based on domestic prices of GNP; and the capital variable used is aggregate capital stock in the economy. For the period 1955–69, the relative-price elasticity of the supply of exports as obtained from the function is 0.50 (with an R^2 of .989); for the years 1960–69 only, it is 0.65 (with an R^2 of .970). For industrial exports alone, the capital variable used is the capital stock in industry; and in the PPP adjustment, two alternative domestic price levels are employed: GNP prices and the level of industrial prices. The former alternative yields a higher elasticity of supply than the latter, and both values are higher than the elasticity found for total exports of goods. When the price variable is the PPP-adjusted effective exchange rate for industrial exports, in which GNP prices are utilized, the elasticity of supply of industrial exports is found to be 1.19 (R^2 is .987) and when local industrial prices are used, the supply elasticity is 0.87 (R^2 is .980). Halevi also attempts a distributed-lag model, to introduce the possibility of responsiveness to relative price changes which stretches beyond a single year. In the regression fitted, about two-thirds of the total adjustment is found to take place over the first year following the price change. The supply elasticity thus obtained using the industrial-prices variant in the PPP adjustment, is 1.34—considerably higher than the figure of 0.87 reached in the simple, nonlagged regression.

From Halevi's estimates, it appears that the supply elasticity of exports is substantial, and probably even high. This impression is strengthened by the realization that these estimates must, for a number of reasons, be biased downward. It should be noted, first, that the estimates exclude the first half of the 1950s, when the exchange-rate changes were not only at their strongest but appear from my data to have had relatively the strongest impact: as has been argued before, slight variations in the exchange rate would result in

lower estimates of elasticities (of supply or demand) than major price changes, because of errors in measurement. It has also been pointed out that the use of annual averages, which inherently incorporate errors in measurement, tends to lower the estimates of the elasticities. No less important is the time lag involved in the response of quantity to price. The use of a distributed-lag model partly solves this difficulty, but does not eliminate it altogether. Thus, Halevi finds a very high elasticity of supply (roughly, 2) of industrial exports in relation to the change in capital stock. It may be assumed that the bias toward exports in the process of growth of capital stock, which is indicated by this elasticity, is itself at least partly a reaction to earlier changes in relative prices in favor of exports. If this is true, part of the quantity reaction to relative price changes would be disguised, even in a distributed-lag model, as a response to changes in capital stock.

Import elasticities of demand are investigated in Weinblat's study,[26] where three main import categories (as well as major subcategories) are examined separately: final consumer goods, investment goods, and intermediate inputs.[27] Imports of each category are assumed to be a function of total domestic use of the category (i.e., respectively, total private consumption, total investment in fixed assets, and total product of industries using intermediate inputs) and of relative prices, that is, prices of imports of the category relative to local prices of the respective local use of the category.[28] Annual averages for 1952–67 are used as observations. As might be expected, the highest (in absolute size) relative price elasticity of demand for imports is for final consumer goods: -3.07 (R^2 of the function $= .720$). The elasticity of demand for investment goods is somewhat lower, but still rather high: -2.27 ($R^2 = .966$). On the other hand, for intermediate inputs, which form the bulk of Israel's imports, the elasticity is rather low: -0.39 ($R^2 = .986$). Given the composition of imports in recent years—when intermediate inputs formed close to two-thirds of the total; investment goods, roughly one-fourth; and final consumer goods, about one-tenth—a weighted average of the three elasticities would yield an elasticity of demand for total imports of close to unity. Weinblat's direct estimate of this elasticity, on the basis of observations for 1952–67, is -1.358 ($R^2 = .976$). This size is not inconsistent with the average of the three groups, since the share of imports of final consumer goods was much higher in the earlier part of this period than later.[29]

These findings indicate a substantial relative price elasticity of demand for imports of about unity. The difference in demand elasticities of these various categories in itself contributes to a decline with time of the elasticity of demand for imports: owing to the strong responsiveness of imports of final consumer goods, the major increases in the relative prices of all imports during the first half of the 1950s helped to engender a particularly large reduction (relative to the size of the economy) of the former and thus, to a decline of

their weight in total imports. In other words, imports consist of more of a "hard core" in later than in earlier years. Yet, the degree of such "hardness" is probably exaggerated by the findings: it seems very likely that the estimate of the elasticity of demand for imports of intermediate goods is biased downward, probably to a substantial degree, by the use of annual observations. The response to price changes of imports of final goods may be expected to be rather fast, although even there it could hardly be expected to be exhausted within a year. On the other hand, changes in imports of intermediate goods may be assumed to be rather slow. An increase in the relative price of imported inputs may be expected to lead to a lowering of imports in three ways: a change in the production techniques of individual industries, leading to the substitution of inputs available locally (whether primary or produced) for imported inputs; the expansion of local production of inputs; and a change in the composition of output (due to the impact on prices of final goods), from industries that are relatively large users of imported inputs to industries that are not. All these are production responses, which require a long period of adjustment. Moreover, it may be assumed that these responses will not be forthcoming unless the relative price changes are themselves durable and consistent, rather than mild and reversible, fluctuations. It will be recalled that price changes of the latter sort have, by and large, characterized the period since 1955. It may thus be argued that, first, the estimate of price elasticity of demand for imported inputs is biased downward because it does not take into account the responses beyond the first year following a price change—presumably the period of main response; and, second, that a different pattern of price changes—one in which the latter would be substantial and persistent—would have led to higher "true" demand elasticities. In view of these biases, the elasticity of demand revealed by the available estimates would indicate a rather high degree of responsiveness of demand for imports to changes in their relative prices.[30]

v. CONCLUSION: DETERMINANTS OF SUCCESSFUL DEVALUATION

The Israeli experience has been quite short. Effective changes in the rate of exchange—"net" rather than "gross" devaluations—have been substantial mainly during a single episode, the devaluation of 1952–54; and significant changes in the *relative* level of the exchange rate, that is, in the purchasing-power-adjusted effective exchange rate, have been even less frequent. Conclusions about the process of devaluation can therefore be only tentative and to some extent speculative.

It seems, first, that substantial changes in the exchange rate have more

impact than small changes, in relation to their size, on trade flows. Since quantities respond to changes in relative prices only with a lag, small changes could not be expected to have much impact: they cannot be relied upon to endure, and thus offer little motivation for changes in the behavior of producing enterprises. This would not follow if such small changes occurred continuously over a long period, because they might then have a cumulative effect, and lead economic units to expect the process to continue; but this has not been tried in the case of Israel.

In the Israeli experience, the importance of the time lag of response seems to be evident more in exports than in imports: the performance of exports could be explained more often than that of imports as resulting from an earlier episode of devaluation. Taking the lagged response into consideration, the supply elasticity of exports appears to be considerable—certainly above unity. The elasticity of demand for imports appears to have been approximately unity, but with considerable differences among import categories: while elasticities of demand for finished consumer goods and for investment goods were high—particularly the former—the demand for intermediate inputs was relatively inelastic. This difference in elasticity may account for the more substantial effects of the major devaluation of 1952–54 compared to the rather limited achievements of later devaluations. Since the effect of relative price changes varies among the different import categories, changes occur in the composition of imports following a devaluation: imports of intermediate goods decline relatively less, and their share in total imports increases. This process clearly appears in the Israeli experience of the 1950s, when it was helped by the structure of QRs, which favored imports of intermediate goods. The increased weight of imports for which the demand is relatively inelastic leads, in turn, to a lower elasticity of demand for imports as a whole. Thus, the more devaluation proceeds and the more the relative price of imports rises, the smaller will be the impact of further devaluations on imports.

The major process of devaluation in Israel has been carried out through formal, statutory changes in the rate of exchange: over the period as a whole, the rates of change of the formal and the effective rates of exchange have been quite similar. The nonformal components of the effective rate—import duties and export subsidies—have served, apart from their discriminatory, protective functions, as devices for smoothing out the process. Between episodes of formal devaluation, the nonformal components were increased gradually, to about the same extent as domestic prices, so as to keep the PLD-EERs on an approximately stable level. When formal devaluations were undertaken, the nonformal components were usually reduced, so that the effective net devaluation was lower than the gross devaluation. This was particularly true for the supposedly major devaluation of February 1962: a gross devaluation of 67 per cent (from IL 1.80 to IL 3.00 per dollar) was reduced,

by the lowering of tariffs and export subsidies, to a net devaluation of about 30 per cent on average (37 per cent for imports and 13 per cent for exports). Combined with monetary-fiscal developments which followed the devaluation, this much lower rate of net change helped to confine the effectiveness of this devaluation to a very short period.

As would be expected, a major factor in determining the degree of success and duration of effectiveness of a devaluation is the demand policy accompanying it. The 1952–54 devaluation was not only of very substantial proportions but was also accompanied, for about two years, by restrictive monetary and fiscal policies. On the other hand, the 1962 devaluation was accompanied by the opposite demand policy. As one of the results, domestic prices increased by only a fraction of the increase in the price of foreign exchange even many years after the 1952–54 devaluation. By contrast the relative increase in the price of foreign exchange was almost completely dissipated within about three years following the 1962 devaluation, thus rendering the devaluation ineffective within a relatively short time. A similar process has also taken place, apparently, during the last few years. The formal devaluation of August 1971, together with the de facto devaluation introduced by the 1970 special levy on imports and some increases in export subsidies during these years, resulted in an increase in the effective exchange rate of about 30 per cent from the beginning of 1970 to the end of 1971. But an expansionary monetary and fiscal policy instituted in late 1970 or early 1971 had by early 1973 restored the PLD-EER to its predevaluation level.[31]

The accompanying of devaluation by restrictive monetary policies has gradually become a more difficult task due to the increasing role of foreign assets and their automatic monetary impact. The devaluation of 1952–54 was aided by the fact that foreign-exchange reserves were nil and automatic forces were absent. At the time of the devaluations of 1962 and of 1971, foreign assets were substantial and rising. The devaluation, by increasing the local-currency value of both the stock and current accumulation of such assets, thus had a strong automatic expansionary impact on money and liquidity in the economy. In principle, this impact could be countered and neutralized—to a greater extent than would be required in the absence of automatic expansion—by a restrictive credit policy, as well as a contractionary fiscal policy. In the Israeli experience, however, the government has normally been unable to conduct such a neutralizing policy. The lesson which may be drawn is that the existence of automatic expansionary forces may be expected to reduce severely the likelihood of success of the process of devaluation.

These automatic forces have been further strengthened by the availability in Israel, since the early 1960s, of large and increasing holdings by the public of foreign-exchange-denominated assets. The linkage of assets to the foreign-exchange rate was meant to induce savings and reduce liquidity.

But this has led to a drastic reduction of the efficacy of the foreign-exchange rate in fulfilling its major function, namely, the changing of relative prices of tradables, and has strengthened the reluctance of the government to use of this instrument.

The automatic expansion of money and liquidity is not realized when devaluation is carried out by manipulating the nonformal component of the exchange rate, that is, by increasing import duties and export subsidies rather than the formal rate of exchange. With such a de facto devaluation, the local-currency value of the stocks and accumulation of foreign assets and foreign-exchange-denominated assets is not increased. A further advantage of this form of devaluation is that it leads to a budgetary surplus, because of the excess of imports over the combined size of exports and government capital imports (assuming that import tariffs and export subsidies increase at the same rate). The imposition of the 20 per cent import levy in 1970—which was *not* lifted with the formal devaluation of 1971—may be an indication that the government has decided to pursue de facto devaluation; but being a single instance, the episode of 1971 is as yet of little significance. It may also be assumed that the taxation of private capital transfers and the circumvention of the foreign-exchange linkage of local assets implied in this procedure cannot proceed very far before the protests of the injured parties prevent its further extension.

In interpreting the short historical experience of Israel's foreign-exchange-rate policy, it probably would be fair to conclude that, by and large, the government responded in the "right" way to the economy's needs, although often with a substantial time lag. As will be argued in the next chapter, the need to devalue arose out of the decline in the relative size of capital imports. Another aspect of this "right" response was, however, the crucial role of emergency situations: by and large, the dating of main points in the process of devaluation may be explained by such emergencies, as expressed in the position of the country's external reserves. Only twice may a devaluation be said to have taken place in anticipation of future needs. One of these occasions was in November 1967, when the British devaluation was seized upon to introduce an Israeli devaluation not otherwise planned. Coming at a time of recession, this devaluation was successful without the addition of any supporting measures. The other occasion was the devaluation of 1962, which over-all should probably be judged a failure. This points to another lesson which could probably be drawn from the Israeli experience: when the government is not acting in an emergency situation, it is less likely to accompany a devaluation by a restrictive monetary-fiscal policy. The contrast between the 1952–54 and the 1962 devaluations provides a glaring example of this rule. A more recent example is given by developments during 1970 and 1971. In early 1970 external reserves were at a very low level and still falling rapidly,

and a clear sense of emergency prevailed. Monetary development was then restrictive primarily because of the automatic impact of the decline of external assets; but fiscal policy also took a restrictive turn as a result of deliberate measures. Later in the year, external reserves started to rise, mainly due to a major U.S. loan for military purchases. Almost immediately, fiscal policy reversed its course and became expansionary, and so did monetary developments, largely owing to the automatic impact of the external reserves.

The ability of the government to accompany devaluations by a restrictive demand policy only in an emergency situation is apparently due to two factors. First, restrictive fiscal policy (and to a lesser extent monetary policy) is painful, in that it raises taxes and lowers expenditures. It is thus politically expedient when a general recognition of emergency prevails, and much more difficult to implement otherwise. The other explanation takes us back to the role of external assets. Since a condition of "emergency" is recognized (as it usually is in Israel) by low and falling reserves, the automatic expansionary impact of devaluation on money and liquidity is absent during an emergency; whereas when reserves are high and rising, an automatic expansion follows.

NOTES

1. Israel joined the International Monetary Fund in late 1954. The rate of IL 1.800 per dollar was established as the currency's initial par value; but this was done only in 1957.

2. This applies to current transactions. To some transfers on capital account, lower formal rates were applied for some time. In April 1958, these special low rates were abolished, making the system uniform all around.

3. The shift in the designation of the rate of exchange from three to two decimal places follows the abolition in 1959 of the smallest currency unit, the "prutah," which was one-thousandth of an Israeli pound. Since then, the smallest unit is the "agorah," which equals one-hundredth of a pound; and the general practice is, accordingly, to specify no more than two decimal places.

4. The fluctuations in the prices of foreign currencies in terms of each other, which have become gradually more important, make the meaning of the "change in the rate of exchange" of the Israeli pound (or of any other currency) somewhat ambiguous. I follow here the Israeli convention of citing the rate of exchange as the price in pounds of the U.S. dollar. It is also the practice in Israel to leave the rate of exchange thus defined unchanged unless a decision to devalue is undertaken. Thus, throughout the period of changes in the international monetary system which started in February 1973, the rate of exchange remained IL 4.20 per dollar. This has meant, of course, a devaluation of varying proportions of the Israeli pound against most other currencies. Since March 1973, the Israeli pound has been fluctuating with the U.S. dollar against all other major currencies.

5. Another major monetary variable, the interest rate, is of no significance in analyzing this area of the Israeli economy. Until 1970, interest rates were subject to a

ceiling, and remained unchanged over very long periods. Consequently, no free-market interest rate could be found that would serve as a meaningful indicator of the level of interest rates. Likewise, the Bank of Israel discount rate—again, very low and unchanged for many years—did not fulfill the normal function of a central-bank discount rate.

6. The public sector in Israel includes, besides the central government and municipalities, the rather substantial Jewish Agency. For earlier years, however, data are confined to the central government alone. In any case, changes in excess demand of the government are the overwhelming component of changes in excess demand of the public sector as a whole.

7. This is because defense expenditures were not disclosed. The defense budget has been almost fully and accurately presented in the government's publicly disclosed budget only since the late 1960s; for at least the preceding decade, however, the defense budget reported in the government's public budget did show the major part of total defense expenditures. In the early 1950s, on the other hand, only a fraction of defense expenditures were publicly disclosed, the rest (probably the major part) being conducted through a special secret budget. Data on the latter have never been made public. But it has become known that the major source of finance of this special budget was the sale of short-term Treasury bills to the Issue Department. The amount of the sale was not disclosed at the time, but published a few years later. Thus, the data on the government's debt, which do include these Treasury bills, reflect the true size of the government's budget, although it is possible that some minor sources of finance and indebtedness, both domestic and external, are still missing from the data.

8. Loans authorized in this way were considered part of the bank's reserves.

9. From mid-1951 to the end of 1953, foreign-exchange reserves had almost no impact on the money supply because they were practically nil and fluctuations in them were insignificant.

10. This is emphasized in Don Patinkin, "Monetary and Price Developments in Israel," *Scripta Hierosolymitana* (Jerusalem: Hebrew University, 1956; in English). Patinkin argues that the New Economic Policy actually started in mid-1951, and was merely given official recognition in February 1952.

11. Available data for the period since 1962 show that rates of change of the economy's *net* reserves (but not, of course, absolute amounts) were by and large similar; so the same conclusions would follow if net rather than gross reserves were used.

12. Credit from the Bank of Israel to the government—the third important element in the determination of the money supply—is primarily a function of budgetary policy-making, and its control has been almost entirely out of the hands of the bank.

13. The turning point—the slowdown in the rate of expansion of the money supply —occurred at about the middle of 1964. Available studies show there is in Israel a time lag of some 10 to 12 months between a change in the money supply and its impact on demand in the economy.

14. This statement should be qualified somewhat. It will be recalled that the part of foreign-exchange deposits that could actually be withdrawn in foreign exchange (which is roughly a third to two-fifths of the total) could also, since 1958, be sold to other Israeli residents at a freely determined price. In devaluation, the value of this part would rise, therefore, by the extent of the change in the free-market price. In the periods immediately following all three relevant formal devaluations (1962, 1967, and 1971) the latter price increased by less than the proportion of the formal devaluation.

15. Foreign-currency deposits are not part of bank reserves. The public's deposits

of foreign exchange are redeposited by the commercial banks at the Bank of Israel in a similar way, creating a separate system of foreign-exchange deposits in which an approximately 100 per cent reserve ratio is maintained by the banks.

16. See Miriam Beham, *Monetary Aspects of the 1962 Devaluation* (Jerusalem: Falk Institute, 1968; in English), particularly pp. 46–54.

17. Owing to the aforementioned deficiencies of the official price indexes, this estimate itself most probably suffers from a substantial upward bias; it is derived by use of a price deflator which is biased downward because it is heavily weighted by official prices.

18. In the course of an attempt to adjust the consumer price index for the existence of black-market prices, Yoram Weiss estimated that the adjusted index increased during 1949–51 by about 50 per cent more than the official index, and that the relationship of the two indices was reversed by approximately the same factor during the period 1952–53. See Yoram Weiss, "Price Control in Israel, 1949–58" (in English), Bank of Israel *Economic Review* 37 (March 1971): Table 2, p. 82.

19. Strictly speaking, the exchange-rate data are quarterly only for 1952–54; for all other years, they are a hybrid of annual data and of data for particular dates when changes took place. For details, see notes to Table 5-5.

20. At the time of writing, the latest devaluation was too recent to permit a more precise analysis of accompanying monetary-fiscal policy.

21. Starting with an exchange rate R_0 for the base period, the purchasing power parity for period 1, R_1, is computed as:

$$\frac{R_1}{R_0} = \frac{P_{H1}/P_{H0}}{P_{T1}/P_{T0}},$$

where P_H is the domestic price level and P_T is the level of foreign-currency prices of the country's tradable goods. In the calculations, P_H is represented by an estimate of the implied GNP price deflator. In principle, exports should have been excluded, so that only prices of sales in the local market would be covered; but in the case of Israel, the inclusion of exports does not lead to significant distortions, because the share of exports is small. P_T is estimated as the weighted average price level (in foreign exchange) of Israel's exports and imports, with last year's values serving as weights.

22. The coefficient of determination (r^2) is .305 for the simple regression of column 3 on column 2; it is .123 for the regression of column 5 on column 4.

23. The following discussion is based on the studies of Nadav Halevi, "Devaluation, Relative Prices, and Exports in Israel" and Jimmi Weinblat, "The Effect of the Effective Exchange Rate on Imports: 1950–1967," both in Nadav Halevi and Michael Michaely, eds., *Studies in Israel's Foreign Trade* (Jerusalem: Falk Institute and Hebrew University, 1972; in Hebrew).

24. Ibid., pp. 26–39.

25. The two other major categories are agricultural exports and polished diamonds. The production cycle of diamond polishing is quite short (probably not longer than five or six weeks), and the size of production could change quite rapidly, both because of technical facilities and because the proportion of permanent workers in the labor force is particularly low in this industry. The responsiveness of exports (which in this industry in Israel are practically identical with production) to price changes may therefore be expected to be relatively strong. But, unlike most of Israel's other industrial exports, its exports of polished diamonds constitute a large share of the world market; and demand in this market is very volatile. Export of diamonds is thus heavily affected by fluctuations of foreign demand, only part of which is presumably reflected in changes in the foreign

price of exports. Likewise, monopolistic restrictions in the market for raw diamonds are important in the determination of Israel's production of polished diamonds at any given time. If such factors could be accounted for, the price elasticity of supply of this export category would probably have been found to be high; but this is only a presumption, whose verification would require an elaborate study.

A somewhat similar problem is found in agricultural products: the random factor introduced by weather conditions complicates the identification of responses to price changes. But more important in this case is the effect of the long time lag involved in such response. Citrus fruits constitute the largest share of exports in this category; and the gestation period (from planting to first marketable yield) of investment in citrus fruit is at least six years. Thus, it would be unwarranted to expect that a change in the exchange rate in one year would be sufficient to induce a significantly large new planting. Even if it were, the result would not show up in the export figures until many years later. Also, price changes could only slightly affect the allocation of a current crop between the local and the foreign markets since almost all the fruit which is technically exportable (being free of deficiencies) is exported. Hence, annual observations of price and quantity of exports of citrus fruit could hardly be expected to reveal any positive supply elasticity.

26. "Effect of Effective Exchange Rate," pp. 67–128.

27. This follows the conventional classification in Israel's trade statistics. A fourth category, excluded from Weinblat's study, is fuel. Also, ships constitute a separate category, and are not included in this study among investment goods. Since the time between ordering and delivery of ships is extremely long, their inclusion in an investigation based on annual observations is likely to be misleading.

28. Weinblat also tried alternative functions in which the two price levels appear as separate variables.

29. The use of 1952 weights, for instance, would have yielded an average elasticity of aggregate demand for imports of about −1.45.

30. In fact, in view of these a-priori considerations the estimate of elasticity of demand for imports of intermediate inputs—close to −0.4—appears to be surprisingly high. It may be assumed that the estimate is heavily influenced by speculative changes: when a devaluation is anticipated (as it may be assumed to have been on a number of occasions), inventories of intermediate inputs are built up, to be run down after the devaluation (whether formal or through changes in import duties) takes place.

It may be mentioned also that the elasticity of demand for imports of fuel, which are excluded from the estimates, is probably quite low. This, if true, would contribute to a lowering of the aggregate elasticity of demand for imports. But this impact could not be very significant, since fuel imports amounted most of the time to some 6 to 8 per cent of total imports of goods.

31. Dating of fiscal policy is difficult. Quarterly data are poor, and circumstantial evidence must therefore be used.