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AN EMPIRICAL ANALYSIS OF ISRAEL'S DEMAND RESPONSE

TO HER BALANCE OF PAYMENTS SITUATION

1956-1973

by

JOSEPH TEMPLEMAN

A dissertation submitted to the Graduate  
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## ABSTRACT

### AN EMPIRICAL ANALYSIS OF ISRAEL'S DEMAND RESPONSE TO HER BALANCE OF PAYMENTS SITUATION

1956-1973

JOSEPH TEMPLEMAN

Advisor:

This study is an empirical analysis of how a relatively small country (i.e., Israel) used her monetary and fiscal tools of controlling aggregate demand to respond to her balance of payments situation. The first and introductory chapter contains an overall outline of the problem, the methodology which is used to gain insight into those problems, as well as some theoretical and background material.

Chapter II of this study is primarily designed for the economist unfamiliar with the Israeli economy. It contains basic background information about the highlights and important areas of the Israeli economy. Chapters III and IV continue in this manner with more detailed and in-depth data that even someone familiar with the Israeli economy could find valuable.

The rest of this study (Chapters V-VIII) contains the empirical analysis of the data, and the results of that analysis two major types of analytical techniques are used -- subperiods of payments imbalances and formal regression analysis. The results of these two techniques are then compared with each other. In the case of fiscal policy a proxy was developed due to the lack of quarterly fiscal data.

Chapter 8 contains concluding remarks in which I attempt to put the analytical results obtained in the previous chapters in their proper perspective.

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## CHAPTER I

### INTRODUCTION

#### Outline of the Problem

This study seeks to analyze and shed light on the following problems. Has Israeli demand policy been responsive to the balance of payments? If it has been unresponsive, or only partially responsive, can this be attributed to the use of demand policy for the achievement of other economic goals to which the Israeli government might have assigned a higher priority? Which instruments of aggregate demand policy were used for balance of payments adjustments? Which were not, or were even manipulated in a manner opposite to balance of payments requirements? How responsive were exchange rate changes (both explicit and implicit) to the balance of payments, and did they work together with or at cross-purposes to demand policy?

Throughout this study the focus will be on the relation between policy instruments and the balance of payments. In addition, however, several other major economic targets will be analyzed. This will serve a dual function. The first is to assure that what appears to be a consistent association between an imbalance of payments and a particular policy variable is indeed what it appears to be, and could not be attributed to the effect of a different target variable. For example, if balance of payments deficits are positively correlated with the rate of inflation, measures taken to slow the rate of inflation could be mistakenly interpreted as being intended for the sake of balance of payments equilibrium, unless this additional target were specifically incorporated into the model. The second purpose of observing competing target variables is to determine to what degree

the absence of a consistent relation between payments imbalances and a particular policy instrument could be due to the preempting of this policy instrument for some other target of higher priority.

Israel has been chosen as the subject of this study. Most of the major trading countries of the free world have already been studied in a major work sponsored by the National Bureau of Economic Research.<sup>1</sup> Those countries not included in that study are either of lesser importance in terms of world trade or (like Canada) had a flexible exchange rate which obviated the need to react to imbalances of payments (whatever an 'imbalance of payments' might mean under such a system). It should be interesting, therefore, to look at a minor trading country and see if the general patterns uncovered by Professor Michaely in the N.B.E.R. study still hold and whether being unimportant results in added flexibility or added constraints.

The years included in this study are 1956-1973. From 1948 through 1952 the Israeli authorities tried to run the economy with rigid price controls, rationing, and quantitative restrictions on imports. At the peak of the control system (during the early 1950's) entirely free markets were few and mainly confined to services. The major economic dislocations and inefficiencies brought on by this policy was finally too much even for the socialistically oriented government to swallow. On February 14, 1952 the New Economic Policy was announced. Although this new policy was quite complex, (including such features as multiple exchange rates), in essence it involved the substitution of the price system for that of rationing and quantitative restrictions over a period of three years. This was accomplished through control of demand through monetary and fiscal policies, major devaluations, and heavy import

duties. By the end of 1955 quantitative restrictions had been effectively scrapped as the major policy instrument for the regulation of imports.<sup>2</sup> Thus the pre-1956 era presents almost insurmountable analytical difficulties in its own right and in comparison with later periods--even if data were readily available. Of course, data for that period is not complete since the Bank of Israel was first created in 1954. Thus 1956 was picked as the starting point of this study.

The Yom Kippur War of October 1973 effectively ended the good times of the post-Six Day-War era and thrust Israel into a new and still unfolding period of Jewish history. Although the war officially ended in 3 weeks, its aftershocks including a bloated defense burden continue to the time of this writing. An analysis of these times must await a later date. This study, therefore, ends before the Yom Kippur War begins.

### Methodology

This study, as stated above, seeks to separate policy reactions to balance of payments disequilibria from reactions to other major policy goals. The other major goals considered are: price stability, full employment, and economic growth. Incorporating these other goals into the model will enable us to explain what might otherwise appear to be inconsistent behavior with respect to imbalances of payments. The problem of separating out responses to a given policy goal from responses to others calls for a multiple regression analysis, wherein a policy instrument (such as rate of growth of the money supply, for example) is the dependent variable and policy objectives (balance of payments, full employment, price stability, and economic growth) are the independent variables.

Although deriving consistent estimates of parameters in a formal regression analysis will constitute a major portion of this study, the regressions alone will not solve all the questions raised. First of all, since we are looking at the effect of our policy objectives on policy instruments there clearly will be some time lag involved. This is composed of the time it takes the authorities to recognize the problem, decide on which instruments to use to solve the problem, and to implement their decision. Since we will be dealing with a whole variety of policy instruments (which we will discuss in detail later), determining the appropriate lag for each instrument is by no means a simple task. I have experimented with various lag structures and will present the best-fitting lags in the appropriate chapter. In addition, there are other qualitative-type questions (such as examining the possibility of changes in policy patterns over time) for which regression techniques would not be appropriate. To analyze this kind of questions we will follow Michaely<sup>3</sup> in distinguishing subperiods of imbalances of payments.

A subperiod of imbalances of payments is the period of time during which the balance of payments is continuously in deficit or continuously in surplus. (It should be pointed out that "continuously" can be interpreted liberally: a brief divergence in the direction of movement could be interpreted as a random fluctuation and not as starting a new subperiod.) In the case of Israel, however, things are not quite that simple. Since (due to Israel's unique situation and problems) the Israeli authorities usually considered certain levels of deficit to be normal and expected, we can also define a 'surplus' subperiod as a move to a smaller deficit or a deceleration of the deficit and a 'deficit' as a move in the opposite direction or an acceleration of the deficit.

The examination of subperiods will focus on the movements of policy instruments and policy objectives within each period. Policy response to the balance of payments will be inferred from an examination of the direction of change of instruments and objectives. In other words, we will determine whether the policy instruments reacted to the balance of payments in an adjusting, disadjusting, or neutral manner (these terms will be more clearly explained in a later discussion).

If an instrument appears to be manipulated in an adjusting manner (in terms of the balance of payments), the movement of other policy goals will be examined. This will aid in determining whether the association of a policy instrument with the balance of payments is truly the result of an attempt to adjust the payment imbalance, or merely the coincidental result of a movement designed to correct a different policy objective.

Thus we will be using two separate but complimentary approaches in the investigation of the responsiveness of policy instruments to the balance of payments. One is the subperiod analysis, and the other is the formal regression analysis. However, the entire study rests on two major assumptions, violation of which would make our results open to serious question.

The first assumption is that changes in policy instruments that occurred were actually desired by the authorities. For example, if we have a deficit in combination with a declining or sluggish growth of the money supply, it could be argued that this tight money is simply the result of the shrinking monetary base due to the deficit, and does not reflect a conscious policy decision on the part of the monetary authorities. I will assume, on the other hand, that the authorities are neither asleep nor incompetent, and had they not desired the tight money conditions

they had ample tools at their disposal to counteract it. The fact that they remained passive and allowed a given condition to develop means that the authorities in all probability desired that situation, and it can be analyzed on that basis. This assumption will have to be somewhat modified later on, as we shall see.

The second assumption is that policy measures do not have an immediate impact on the target great enough to reverse the direction of change which originally gave rise to the policy action.<sup>4</sup> This assumption is necessary to insure that we are analyzing the effects of objectives on policy instruments and not the effect of policy instruments on objectives. We would hope to be analyzing, for example, how an imbalance of payments caused the monetary authorities to change the rate of growth of the money supply, and we would hope not to be inadvertently picking up how a change of monetary policy affected the balance of payments. Both assumptions appear to be reasonable, and we proceed on that basis.

So far we have only defined the policy objectives (i.e., balance of payments, full employment, price stability, and economic growth) which are being incorporated into this study. Policy instruments are, however, somewhat more complex and numerous than policy objectives. They include the following: rate of growth of the money supply, total credit to the public, central bank net lending to the government, central bank lending to commercial banks, minimum reserve ratio, open market operations, discount rate, budgetary balance (as a measure of excess government demand) and the effective exchange rate (i.e., formal rate + taxes - subsidies). Some of these policy instruments warrant a brief comment here, although they will be discussed in greater detail later.

Minimum Reserve Ratio - This is the Bank of Israel's most important (and for many years only) method of controlling monetary expansion and contraction. Due to a policy of "directed credit" which exempted certain deposits from liquidity requirements, the formal minimum reserve requirement must be substantially adjusted to get a clear picture of how this instrument was actually being manipulated.

Total Credit to Public - This refers to the total credit of the commercial banking system other than to the government. The amount of this credit was theoretically controlled by the reserve ratio requirements, which were very high (90% at the margin for deposits added after a given base date); but banks could lend "beyond the reserve requirement" by specific government authorization (which usually was forthcoming). Loans authorized in this manner were considered part of the banks' reserves.

Open Market Operations - Due to the underdeveloped state of the Israeli securities market, authority was not granted to the Bank of Israel to buy and sell short term treasury bills until November 1966, and even then it got off to a slow start for reasons to be discussed.

Discount Rate - In Israel the discount rate was frozen for years at a time at a (artificially low) fixed rate. Till 1957 it followed the Ottoman rate of 9%, after which it was raised to 11%. The discount rate was never used as a tool of monetary policy in Israel. Rather it was used as an indirect instrument to subsidize exporters by enabling banks to lend to exporters at 6% even when that represented a negative real rate of interest.

Central Bank Net Lending to the Government - This represents the net indebtedness of the government (+ or -) to the central bank. It can be derived by subtracting government deposits at the central bank from government borrowing from the central bank. Only changes in net lending will affect the amount of liquidity in the economy. This variable is, of course, highly correlated with the internal deficit or surplus.

Each policy instrument will be looked at individually to see whether it moved in an adjusting or disadjusting manner. Thus if there is a deficit in the balance of payments, any instrument which moves in the direction of lowering aggregate demand will be termed to have moved in an "adjusting" manner. And, of course, had it moved to raise aggregate demand it would have been considered to be "disadjusting". After each

policy instrument is looked at individually, the observations of individual instruments will be combined to see whether they imply a reasonable pattern of reaction, and whether or not this pattern is of an adjusting nature. There are several complications, however, which should be mentioned at this point.

When we look at the government's budget balance, we are really attempting to measure the government's excess demand for goods and services. Any increase in excess demand, be it through an increase in deficit or a reduction in surplus adds to the economy's aggregate demand, and must (everything else being held constant) add to the external deficit. The reverse will hold true for any decrease in excess demand through an increase in surplus or a reduction in deficit. Therefore we must investigate the direction of change of the internal balance from period to period. But how do we know that the actual, realized movements of the budgetary balance (which our data shows) is actually equivalent to the movements planned and anticipated by the policy maker? Under certain extreme assumptions (if investment is a function of tax rates, for example) an intended expansionary fiscal policy could theoretically push investors into higher income brackets with higher marginal tax rates, thereby reducing investment enough to result in a contraction of aggregate demand. Granted that this is very unlikely. But it highlights the conceptual problem of using ex-post data to infer about ex-ante plans. Nevertheless, since ex-post data is fragmentary, incomplete, and probably doesn't really reflect the true anticipations of policy makers; and since the probability of being misled in the fiscal sphere is small (and in the monetary sphere even smaller), we will use actual performance as a measure of planned anticipations.

Another analytical drawback is our implicit assumption of everything else being equal. For example, if in a time of deficits the excess demand of the government were to rise, we would conclude that this was a movement in a disadjusting direction. But what if due to exogenous factors outside our model (i.e., a tense border situation) excess demand would have risen even higher than it in fact did, but was restrained from reaching those heights by a government concerned with its balance of payments. Here clearly excess demand moved in fact in an adjusting manner, but the researcher is misled into misinterpreting it as a disadjusting movement. This is a type of problem that exists in almost all empirical economic studies, and is usually not possible to completely overcome.

Finally, we should glance at how we will determine imbalances of payments and the three other policy targets (price stability, low unemployment, and economic growth). Since our primary goal in this study is to identify and examine the policy reaction of the Israeli government to payments imbalances, the ideal variables for measuring these imbalances are those used in the Israeli decision-making process. In the absence of specific information to the contrary, it can be assumed that the Israeli authorities followed the generally accepted standard procedures of identifying imbalances. We will experiment with several of these methods of identifying payments imbalances to determine which yields the best results.

The simplest, most easily observed variable is the level of Israel's external reserves. This will be represented by Israel's "gross official reserves", which includes deposits abroad of both commercial banks and the government, as well as foreign assets of the Bank

of Israel. An increase in these reserves would indicate a surplus, and a decrease would indicate a deficit. Other measures which we will test include the balance of payments, the secular trend of external reserves (whereby levels above the long-term trend represent a movement towards surplus, and below represents a movement towards deficit), the ratio of external reserves to imports with respect to its movement from a desired level. These will be discussed in greater detail later on. It is to be expected that these various measures of payments imbalances will tend to move in concert quite often.

The remaining three policy targets are price stability, low unemployment, and economic growth. The consumer price index will serve as our measure of price stability, the percentage rate of unemployment will represent itself, and economic growth will be represented by the rate of change of the index of industrial production. We then must face the problem of how to judge and interpret each of these time series. Each target while observed in the form of a given time series, could be judged in any of several ways. It could be judged by its level, its direction of change, or by its rate of change. For example, a high rate of unemployment (compared let's say to its mean value) which is rising would certainly be considered a disturbance. But what if unemployment were high but falling? Or if it were low but rising? What if GNP is below its trend level but the rate of increase is above average? Or if the GNP is above its trend but the rate of increase is falling? And similarly with the inflation rate. It won't be possible to examine every possible combination, but our overriding concern will be to try to look at these issues through the eyes of the policy makers and try to judge these series in a manner which appears consistent with how the

Israeli authorities judged them.

### Theoretical Aspects

It has been shown algebraically<sup>5</sup> that external deficits are the result of excess aggregate expenditure (also known as total domestic "absorption") over real national income (i.e., output). Any nation whose level of national expenditure (or total absorption of resources) exceeds the sum of its home output plus its normal capital inflow must run a deficit (which can be temporarily financed through gold and foreign currency outflows and/or by an accommodating capital inflow). Thus the external imbalance is simply a reflection of the internal disequilibrium, and it would be equally correct to refer interchangeably to either excess spending or to an imbalance of payments. It follows that neither import restrictions nor devaluation alone will be successful in correcting an external imbalance. Such measures must be implemented in conjunction with policies that reduce aggregate demand or they will be ineffective.

Long-term import controls and/or directed investment (i.e., towards export or import-competing industries) are poor substitutes for proper control of aggregate demand. Behind the protection of import regulations, monopoly and oligopolistic elements tend to be enhanced, and distortions in production lead to investments of low social marginal product yielding high private profits. In addition, import controls tend to increase costs thereby both undermining the competitive position of export industries and diverting resources from export development to import-competing industries. This diversion must be wasteful since resources are being shifted from a more efficient indirect production of importable goods to a less efficient direct production

of import substitutes at higher real cost. Similarly with directed investment. The investment that will actually be most beneficial to the balance of payments is that which makes the greatest possible contribution to national output. Arbitrarily allocating investment to import-competing or export industries almost guarantees that such investment will not yield the maximum possible marginal productivity, and thus will not be of maximum benefit to the balance of payments.

All these adverse affects will result when import control is attempted without controlling aggregate demand. That attempt is almost always doomed to failure, and the resulting misallocation of resources can be very expensive in terms of a lower real income available to that society. On the other hand, a combined policy of both control of aggregate demand along with devaluation or import control, can be far more effective than just reducing aggregate demand alone. By combining a devaluation with a reduction in demand, we can achieve a given improvement in the balance of payments at a higher level of employment than if deflation were used alone.

Aggregate demand policy itself can be broken up into monetary and fiscal policy. This is unimportant if a country is experiencing over-employment and an external deficit. A general demand deflation will suffice. It is also unimportant if a country is experiencing unemployment and an external surplus. Then an expansion of aggregate demand is called for. Separating monetary and fiscal policies does become important however in the other two potential situations. Recession combined with external deficit, and inflation combined with surplus result in potential conflicts. In the first case, steps taken to raise aggregate demand to fight the recession would tend to increase the external

deficit, while deflating to reduce the deficit would worsen the recession. In the second case, steps taken to deflate to control the inflation would tend to aggravate the external surplus, and steps taken to raise demand to reduce the surplus would tend to aggravate the inflation. What the theory advocates in this case is to assign one instrument to the internal imbalance, and one to the external imbalance. It is preferable to assign fiscal policy to the internal imbalance and monetary policy to the external imbalance, since there are conditions under which the reverse assignment would not work.

In practice, however, this simple rule would break down if policy adjustment doesn't take place in a smooth continuous manner as assumed by the theory. Since in the real world we have lags in recognizing the problem, deciding to do something about it, implementing that decision with policy instruments, and waiting for those instruments to take effect, the assignment rule mentioned above is really quite useless. Instead a two stage rule should be followed. First employ the one policy tool whose required adjustment is unambiguous, until one goal is reached; the direction of adjustment of the second tool will then also be unambiguous. For example, assume that we know that fiscal policy must be expansionary, but we are unsure as to the correct direction of monetary policy. Then we should institute an expansionary fiscal policy until the economy reaches either external balance or internal balance (i.e., full employment). If external balance comes first (i.e., no surplus or deficit), while there is still unemployment, then an expansionary monetary policy is called for (in addition to further fiscal expansion). If the internal balance is reached first

(i.e., full employment), with external imbalance still remaining, then a contractionary monetary policy is called for (again in conjunction with an expansionary fiscal policy). We will have occasion to point out later, however, that the highly underdeveloped state of the security market in Israel created major obstacles to the successful implementation of simple monetary policy, let alone sophisticated assignment responses. The theory just presented will constitute the background or framework which will be used for the essence of the study, which constitutes an empirical analysis of the Israeli policy response to imbalances of payments. It will be the primary objective of this study to focus attention on the manipulation of aggregate demand in response to balance of payments fluctuations. Since devaluations are in general ineffective without a simultaneous reduction in aggregate demand, they will not be treated with the same rigor and attention given to changes in aggregate demand.

#### Economic Background<sup>6</sup>

Before independence in 1948, Israel was governed as a British colony, and all major decisions were made in London. Local economic autonomy was very small, and such items as the annual budget and tax policy needed British approval. No central bank existed in pre-independence Israel, and no fiat money was issued. The local currency was named the Palestinian Pound by the British (after 1927) and was managed from London by an entity that went by the name of the Palestine Currency Board. This currency had 100% backing in the form of British treasury bills. In 1954 Israel established its own central bank, known appropriately enough as the Bank of Israel. In the intervening years between independence in 1948 and the establishment of the Bank of Israel in 1954 the

the government authorized the country's largest commercial bank (Bank Leumi) to issue currency. At first the government required that 50% of all currency issued be covered by foreign assets. But this was rapidly changed to include Israeli Treasury bonds and bills as acceptable coverage, thus effectively removing all barriers to internal government borrowing.

Independence also brought significant changes to Israeli trade and foreign exchange policy. The very liberal foreign trade policy during the British mandate prevented significant local industrial development. Without protective regulations local production was not competitive, and thus did not develop. The outbreak of war in 1939 changed all that. The almost complete isolation of the Middle East during World War II served just as well as high tariffs in fostering local industrialization. Local demand, regional demand, and demand from the armed forces stationed in the area gave a huge impetus to manufacturing (which was predominantly Jewish). With the end of the war, as wartime difficulties were overcome, the newly established industries discovered that they couldn't successfully compete and most of them vanished from the scene. The few industries still existing at the time of independence in 1948 were competitive. But the memory of the industrial boom during the war when not faced with foreign competition remained vivid and was a strong influence in shaping post-independence trade policy.

From independence in 1948 through the end of 1951 a very stringent allocation system was introduced. The foreign exchange rate was kept virtually constant, foreign currency was allocated to approved imports (under a complex licensing scheme), rigid price controls and rationing were introduced, and local industry was encouraged. (Israel was at the

time in the process of rapidly doubling her population, and it was felt that scarce foreign exchange should be allocated to the necessities of the low-income groups rather than the luxuries of higher income groups). Local industry was promoted to the extent that any consumer goods that could possibly be locally produced received a foreign currency allocation of zero, i.e., their importation was prohibited. Of course, over time the gap between the official exchange rate and its free equilibrium level kept widening, and the fraction of desired imports actually getting a foreign currency allocation kept shrinking. Internally, rigid price controls combined with expansionary monetary and fiscal policy worsened the degree of disequilibrium in the system, and the economy began to unravel. Black markets developed and proliferated, foreign exchange reserves became completely exhausted, local production was often brought to a halt for lack of imported raw materials, and discontent became widespread. It became obvious even to the socialistically oriented Israeli leadership that things could not go on this way, and that the time for a major policy overhaul had arrived.

The change began in mid-1951 with a switch to a restrictive monetary and fiscal policy. But the key policy reversal first took place in February 1952 with the announcement of the "New Economic Policy". A system of three different exchange rates was introduced, the highest of which (IL 1 per dollar) was roughly triple the previous rate (IL 0.357 per dollar). More and more items were shifted from the lower rate to the higher, thus raising the weighted average of the three exchange rates. By 1954 an even lower rate of IL 1.80 per dollar was in effect for most transactions, and that rate was to remain in effect until the devaluation of 1962. Thus a combination of major devaluations with a rather

restrictive monetary and fiscal policy succeeded in sharply reducing the disequilibrium in the system. Price controls were also gradually lifted, and as a result black markets diminished and rationing became less severe. By the end of 1954 the economy was beginning to function once again, and equilibrium had been pretty much achieved, both internally and externally.

By the beginning of 1955 (as a result of the external equilibrium that had been achieved) emphasis shifted from protection to save foreign currency to protection to encourage local industrialization. Thus imports of consumer goods was still practically prohibited in those areas where there was either actual or potential domestic production, but there was a rapid liberalization of imports of those raw materials not locally available (and a somewhat slower liberalization of investment goods). This liberalization policy continued for several years and led to the devaluation of 1962.

In February 1962 the second "New Economic Policy" was declared. The formal rate was raised from IL 1.80 per dollar to IL 3.00 per dollar, a formal devaluation of 67%. However, as we will see in much greater detail later, the effective or net devaluation was substantially less than this formal change would indicate, since most export subsidies were abolished, and many import duties were lowered. In effect between 1955 and 1962 although the formal rate of exchange remained constant at IL 1.80 to the dollar, slowly increasing export subsidies had been raising the effective exchange rate and implicitly devaluing the currency. Thus this devaluation of 1962 when combined with the other policy changes on tariffs and subsidies did not result in a major effective devaluation at all. It was mostly instituted to unify and consolidate the mess that had developed, and to bring the formal and effective rates more into line with each other.

In addition, the remaining quantitative restrictions were to be replaced under the New Economic Policy by tariffs (so that the economic cost of these restrictions would be more apparent). This was completed by 1969.

In 1967 the formal rate of exchange was raised to IL 3.50 to the dollar, and in 1971 to IL 4.20, and in June 1975 to IL 6.00. Since then there have been a continuing series of mini-devaluations known in Israel as "creeping devaluations". These have been reaching a maximum of 2% a month and give every appearance of so continuing. At the time of this writing the official rate of the Israeli pound stands at roughly IL 9 to the dollar. Barring sudden peace or a major oil discovery it is certainly going to continue its rapid decline.

CHAPTER II

MACROECONOMIC OVERVIEW

This chapter is designed primarily for the reader who is unfamiliar with the Israeli economy. It contains a description of such items as GNP, foreign trade, the banking system, money supply, and inflation.

Gross National Product

Israel (prior to the Yom Kippur War) had the good fortune of having one of the fastest real rates of growth of GNP in the world, so much so that it was often referred as 'miraculous'. It was based on a combination of rapidly rising population with large capital inflows. What is more interesting however is that even per capita real GNP showed a remarkably rapid rate of growth, as Table 2.1 below demonstrates.

A glance at this table shows that even in the worst of times (such as the recession of 1966-67, the major dislocations initially brought about in 1952 and 1953 by the implementation of the "New Economic Policy" of February 1952; and the post-Yom Kippur War period) real GNP always continued to rise, although real per capita GNP did fall on occasion.

In order to give as complete a picture as possible, Table 2.1 has been expanded to include years prior to and beyond the formal scope of this study (which is 1956-1973). In addition data on annual population growth is presented, since this was a major influence on the rate of growth of real GNP.

TABLE 2.1

YEAR	% CHANGE IN REAL GNP	% CHANGE IN REAL PER CAPITA GNP	% INCREASE IN AVG. POPULATION
1949			35.4
1950			16.7
1951	30.9	11.0	15.2
1952	7.4	-0.1	3.3
1953	1.2	-1.5	2.4
1954	21.9	19.2	2.9
1955	12.2	8.3	4.2
1956	10.0	3.9	4.5
1957	11.0	3.4	5.6
1958	8.1	5.6	3.6
1959	11.0	7.8	3.1
1960	8.0	5.2	2.7
1961	10.2	6.6	3.4
1962	12.7	7.8	4.5
1963	11.5	7.2	4.0
1964	10.3	6.0	4.1
1965	8.4	4.8	3.4
1966	1.1	-1.5	2.6
1967	2.7	-0.5	3.2
1968	14.0	10.2	3.4
1969	12.0	9.2	2.6
1970	8.0	5.1	2.8
1971	8.8	5.7	3.0
1972	10.3	6.8	3.3
1973	6.7	3.2	3.3
1974	6.7	3.5	3.0
1975	1.0	-1.3	2.3

Source: Bank of Israel, Annual Report 1955-1975<sup>1</sup> .

It is of interest in this context to briefly glance at the sectoral breakdown of Israeli output, and the changes that have taken place over the years. Table 2.2 below presents this data for selected years. Over the years the role of agriculture has tended to decline, reaching a bottom in 1973 (not shown in Table 2.2) of 6.0% of Net Domestic Product. Since then it has begun to stage a comeback and reached 6.8% in 1975. Industry has been bouncing between 20% and 25% of Net Domestic Product in a rather random manner, never sinking all the way to 20% and never rising to 25%. Construction and Transportation have risen in importance over the years, while finance and services have tended to decline slightly in relative importance. Public Sector Services have remained fairly constant throughout this period.

TABLE 2.2 <sup>2</sup>

SECTORAL ORIGIN OF ISRAELI NET DOMESTIC PRODUCT  
(Selected years; in percentage form)

	<u>1955</u>	<u>1960</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>
1. Agriculture, Forestry, Fisheries:	11.9	11.5	8.3	6.4	6.8
2. Industry, Mining, Quarrying:	20.8	24.5	24.0	23.7	24.0
3. Construction, Electricity, Water:	8.9	8.2	9.9	12.0	12.0
4. Transportation & Communication:	7.8	7.6	8.1	8.8	9.0
5. Finance, Trade, Personal Services; & Business Services:	31.7 <sup>3</sup>	27.8	23.9	22.8	20.0
6. Imputed Housing Services:		4.6	6.7	7.2	7.0
7. Public Sector Services:	<u>18.9</u>	<u>15.8</u>	<u>19.1</u>	<u>19.1</u>	<u>19.0</u>
Total Net Domestic Product:	100.0	100.0	100.0	100.0	100.0

Table 2.3 below breaks GNP down into the standard C, I, and G (consumption, investment, and government). Instead of GNP, however, we will use GNP+ Net Imports which measures the total resources available for consumption, investment, and government. In an economy such as Israel where net imports adds a significant amount of additional available resources beyond the calculated GNP, it is a better procedure to look at C, I, and G as percentages of total resources, and this is therefore the method used by the Bank of Israel.

TABLE 2.3 <sup>4</sup>

PERCENT OF TOTAL AVAILABLE RESOURCES BY COMPONENT

YEAR	PRIVATE CONSUMPTION	TOTAL INVESTMENT (public+private)	GOVERNMENT CONSUMPTION
1950	61.5	15.6	22.9
1951	61.6	17.2	21.1
1952	63.1	16.7	20.1
1953	65.3	13.0	21.7
1954	61.7	23.4	14.9
1955	58.6	25.4	15.9
1956	57.5	21.9	20.7
1957	59.0	24.1	16.9
1958	60.0	23.5	16.4
1959	60.4	23.2	16.4
1960	61.0	22.2	16.8
1961	60.3	23.1	16.6
1962	56.5	25.8	17.7
1963	57.7	25.1	17.2
1964	56.7	27.1	16.2
1965	58.0	24.3	17.7
1966	61.4	18.7	19.8
1967	61.8	12.8	25.4
1968	58.5	16.8	24.7

TABLE 2.3 (continued)

PERCENT OF TOTAL AVAILABLE RESOURCES BY COMPONENT

YEAR	PRIVATE CONSUMPTION	TOTAL INVESTMENT (public+private)	GOVERNMENT CONSUMPTION
1969	53.4	21.1	25.5
1970	49.2	21.9	28.9
1971	47.2	24.8	27.9
1972	48.1	25.5	26.4
1973	43.3	23.8	32.8
1974	44.1	25.6	30.3
1975	43.1	23.9	33.0

It is clear from this data that there has been a marked deterioration over the years of the share of the total pie going to private consumption, and an increase in the share devoted to government consumption and investment (a large part of which is government financed). The government of Israel has succeeded in appropriating a significant amount of resources (through higher income and sales taxes, heavy import duties, and a tax on cash balances -- called inflation) for use in the public sector.

Foreign Trade

Over the years the Israeli economy has become increasingly dependent on foreign trade. Both imports and exports have risen much faster than the rise in GNP. Table 2.4 highlights this trend.

TABLE 2.4<sup>5</sup>IMPORTS AND EXPORTS AS A PERCENT OF GNP

<u>YEAR</u>	<u>IMPORTS</u>	<u>EXPORTS</u>	<u>YEAR</u>	<u>IMPORTS</u>	<u>EXPORTS</u>
1955	36.2	12.2	1966	31.5	21.1
1956	38.0	12.3	1967	35.9	23.2
1957	32.8	13.1	1968	45.0	28.7
1958	30.2	12.3	1969	53.1	30.5
1959	28.9	14.3	1970	55.0	29.4
1960	30.3	16.4	1971	57.9	33.6
1961	28.0	14.0	1972	57.0	35.2
1962	41.2	21.9	1973	71.8	34.1
1963	38.2	22.9	1974	71.1	34.0
1964	38.2	21.0	1975	77.2	36.3
1965	33.9	20.1			

Exports, it is interesting to note, took sharp upward jumps after the devaluations of February 1962 and November 1967. Imports began their heavy acceleration after the Six Day War of June 1967.

Banking System

Modern banking in the Land of Israel had its origins with the inauguration of British rule in 1918, and the resulting establishment of the Anglo-Palestine Bank (originally known as the Anglo-Palestine Company). After the establishment of the State of Israel in 1948, the Anglo-Palestine Bank became banker to the government and bank of issue, while at the same time remaining Israel's largest commercial bank. In 1951, the Anglo-Palestine Bank was renamed Bank Leumi, which to this day is Israel's leading commercial bank. However, Bank Leumi lost its position of banker to the government and bank of issue with the establishment of the Bank of Israel in December 1954.

There is a high degree of specialization in the Israeli banking system. Commercial banks are, on the whole restricted to short-term business. Medium and long-term transactions are handled by specialized institutions specifically established to service agriculture, industry, housing, tourism, and shipping. Some of these institutions are completely government owned and others are jointly owned by the commercial banks and government in partnership.

There are a total of roughly 15 commercial banks in Israel, with the three largest (Bank Leumi, Bank Hapoalim, and Israel Discount Bank) accounting for about 78% of all bank branches and 87% of total assets at the end of 1974. Table 2.5 below gives the actual figures.

TABLE 2.5

OFFICES AND ASSETS OF COMMERCIAL BANKS

December 1974

	<u>Number of Offices</u>	<u>Assets (IL Million)</u>
Bank Leumi	280	31,049
Bank Hapoalim	234	25,408
Israel Discount Bank	190	14,436
All Others	195	10,749

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As was mentioned previously, the Bank of Israel was established in December 1954. It is presided over by a NAGID (i.e., governor), who also serves as chief economic advisor to the government. From 1954 to 1971 this post was filled by David Horowitz, from November 1971 till early 1977 it was filled by Moshe Sanbar, and just a few weeks ago (Spring of 1977) Arnon Gafny took over. The Bank of Israel is Israel's central bank, with the sole right to issue currency. Its specific tasks as stated in

the law setting up the bank are: "to administer, regulate, and direct the currency system, and to regulate and direct the credit and banking system, in accordance with the economic policy of the government, with a view to promoting by monetary measures (1) the stabilization of the value of the currency in Israel and abroad, and (2) a high level of production, employment, national income and investment in Israel". The nagid is assisted by a seven man advisory committee and a fifteen man advisory board (which is composed of the seven people on the advisory committee plus eight other representatives of various economic interests and political parties).

In addition to its responsibility for and control over monetary policy, the Bank of Israel has other tasks assigned to it. Periodically it must examine bank operations (including special credit banks and other financial institutions) to prevent unsound practices and protect the public interest. It serves as a central clearing house for banks, administers state loans, and represents the state at the International Monetary Fund, the International Bank of Reconstruction and Development, and affiliated bodies. Last but certainly not least, within five months of the end of every fiscal year the nagid must submit an annual report on the Bank's operation and an analysis of the country's economic and financial situation. These annual reports have proven invaluable in writing this dissertation.

#### Money Supply and Inflation

We will have occasion to utilize these variables in detail on a quarterly basis in the analytical sections of this paper. At this point the reader might be interested in familiarizing himself with the overall trends of monetary growth and inflation on an annual basis. Table 2.6

below is included for that purpose.

TABLE 2.6 <sup>6</sup>

MONEY SUPPLY AND INFLATION 1955-1975

YEAR	TOTAL MONEY SUPPLY ANNUAL AVERAGE (IL millions)	YEARLY RATE OF INCREASE (percent)	PERCENT INCREASE OF CONSUMER PRICE INDEX
1955	395	20.4	5.9
1956	465	17.7	6.5
1957	558	20.0	6.4
1958	642	15.1	3.4
1959	724	12.8	1.5
1960	820	13.3	2.3
1961	970	18.3	6.7
1962	1126	16.1	9.4
1963	1474	30.9	6.6
1964	1679	13.9	5.2
1965	1826	8.8	7.7
1966	1963	7.5	8.0
1967	2344	19.4	1.0
1968	2815	20.1	2.1
1969	3015	7.1	2.5
1970	3167	5.0	6.1
1971	3876	22.4	12.0
1972	5034	29.9	12.9
1973	6315	25.3	20.0
1974	7566	29.9	39.7
1975	9913	31.0	39.3

CHAPTER III

THE BALANCE OF PAYMENTS AND FOREIGN EXCHANGE POLICY

This chapter will briefly discuss the history of formal devaluations in Israel, why formal exchange rate changes were used so infrequently, and how and why nonformal exchange rate changes were substituted for formal changes. In the interest of historical completeness we will discuss these issues from the very beginning of Israel's existence. The next chapters will contain the more formal analysis of demand policies and the balance of payments, which for reasons discussed earlier will be confined to the period between 1956-1973.

The Israeli pound started life in August 1948 on a par with the pound sterling. However, a broken-cross-rate system existed, since the pound sterling was worth \$4.00 at the time, while the Israeli pound went for only \$3.00. When the British devalued the pound sterling in September 1949 to \$2.80, Israel used the opportunity to repair its broken cross-rate system by maintaining par with the pound sterling, while devaluing only slightly against the dollar to \$2.80 per Israeli pound. Thus Israel's first devaluation was about 7% against the dollar (and associated currencies), and 0% against sterling (and associated currencies).

The next formal devaluation took place in February 1952 with the declaration of the New Economic Policy. As discussed previously, a multiple exchange-rate system was introduced. This consisted of three separate rates, known simply as A, B, and C. Rate A was set at \$2.80 per Israeli pound, and was known as the official rate. Rate B was \$1.40 per pound, and rate C was \$1.00 per pound. Even in 1952 few transactions were conducted at rate A (the official rate) -- they were transacted in general under either rates C or B. During 1952 and 1953 progressive

devaluations were quietly accomplished by gradually shifting transactions from rates A to B and then from B to C. In April 1953 a new rate, C-2, was established at 55½¢ per Israeli pound. Once again transactions were rapidly shifted to this rate, and by the end of 1953 this rate applied to most transactions. In December 1953 rates A and B were done away with, and rate C was declared the official rate, although by that time almost all transactions were taking place at rate C-2 (55½¢ per pound). In August 1954 rate C was also officially done away with leaving only rate C-2. By July 1955 it had dawned on the authorities that only rate C-2 (55½¢ per pound, or IL 1.80 per dollar) was left, and so it was formally established that month as the official rate, which remained in effect until the next formal devaluation in 1962. Thus, from February 1952 to mid-1954 the transactions rate of the Israeli pound fell from \$2.80 per pound to 55½¢ per pound, a fivefold increase in the cost of foreign exchange, or a devaluation of over 400%.

The next formal devaluation took place in February 1962 when the Israeli pound was revalued from IL 1.80 per dollar to IL 3.00 per dollar, a devaluation of 40% (or an upward valuation of 67%). As we will soon see, however, the effective devaluation was much smaller. The new rate of IL 3.00 = \$1.00 was maintained until November 1967 when Israel followed the 14.3% British devaluation, thereby maintaining parity with sterling while devaluing 17% against the dollar. Thus in terms of the dollar the Israeli pound fell from IL 3.00 per dollar to IL 3.50 per dollar. In August 1971, the pound was devalued another 16.7% against the dollar from IL 3.50 per dollar to IL 4.20. A further devaluation of 30% took place in June 1975 with the Israeli pound declining to IL 6.00 to the dollar. Since each major devaluation was (despite strict

currency controls) preceeded by substantial black market speculation against the Israeli lira, with the resulting large transfers from the public to the successful speculators, the government instituted a policy of creeping devaluations, not to exceed 2% per month. It was hoped that this new method of devaluing the currency gradually would at least help limit and contain the "unjustified" earnings of the currency speculators and the associated losses to the treasury. Most recently in 1976 a further minor adjustment was made by pegging the lira to a "basket" of (i.e., a weighted average of) major European currencies and the U.S. dollar, rather than just to the dollar alone as had been the case up till then. This was designed simply to limit the effect of changes in the dollars' value relative to the major European currencies on the value of Israel's currency vis-a-vis those of Europe. In other words, Israel had been taken by surprise several times by the unexpected strength of the dollar which tended to raise the value of the Israeli lira in terms of European currencies thus hurting Israel's European exports. Pegging the lira to a basket of currencies would sharply reduce any future fluctuations.

Looking only at the formal Israeli devaluations is highly misleading, however. Until the Yom Kippur War of 1973, formal devaluations were few and far between. But to calculate the effective exchange rate account must be taken of import tariffs and export subsidies. The data shows that these were manipulated between formal devaluations to create a continuous effective devaluation which would eventually be formalized by an official devaluation. Upon formal devaluation, the nonformal components would be drastically reduced, to sharply reduce the effect of the change on the effective rate of exchange.<sup>1</sup>

The 1962 upward revaluation (IL 1.80 to IL 3.00 per dollar) of 67% is a good illustration of the above point. While the formal devaluation was indeed close to 67%, the increase in the average effective rate of exchange for exports was only about 13%. This was the result of the abolition of most export subsidies that had been slowly increasing in the years prior to the devaluation. On the import side, tariffs were reduced enough to keep the effective rise in rates down to about 37%, rather than the official 67%. This same pattern repeated itself (on a smaller scale) during the smaller devaluations of November 1967 and August 1971. The nonformal components of the exchange rate was in effect manipulated (primarily through export subsidies, which were abolished or reduced during formal devaluations) as a substitute for formal devaluation. Thus, contrary to the impression one gets by focusing on the few formal devaluations, there was really a constant continuous devaluation in progress during this period.<sup>2</sup>

Devaluation then was a relatively stable and continuous process (prior to the Yom Kippur War of 1973), and was executed by a process of raising export subsidies in the years between formal devaluations and then sharply reducing or even abolishing them with announcement of a formal devaluation. Why was such a cumbersome method of devaluation employed, especially when it obviously would tend to increase the degree of diversification and discrimination involved in the exchange-rate system? This question takes on added significance when it is recalled that Israel is so small a trading entity on the world scene that it had little to fear that a formal devaluation would induce its trading partners to reciprocate.

Probably one of the most important reasons for devaluing in this

informal manner was to avoid too rapid a rate of growth in the money supply, which could have raised aggregate demand enough to undo the formal devaluation. From 1957 on, recipients of German restitution payments were permitted to keep part of their receipts in foreign exchange deposits or (which amounts almost to the same thing) deposits denominated in foreign exchange. At first these deposits were of minor importance, but during the 1960's (with the sharp increase of German personal restitution payments) these deposits became a very important economic factor. For example, in 1957, the ratio of these deposits to the money supply was only 3.9%, in 1962 it was 43.5%, in 1967 it was 63.1%, in 1970 it was 88.7%, and by 1971 it had surpassed the money supply itself, being equal to 110.2% of the money supply!<sup>3</sup>

It can now be understood why the Israeli authorities were so reluctant to undertake formal devaluations. Any formal devaluation would have automatically increased the value (in terms of Israeli lira) of the foreign-exchange deposits by the proportion of the devaluation. This would have made holders of these deposits wealthier with the resulting increase in their propensity to consume, thus raising aggregate demand. Secondly, a portfolio adjustment would take place in the form of a shift away from (the now excess) liquid assets to real assets (at least in part), thus further increasing aggregate demand. And last, but certainly not least, the above expenditures necessitate the conversion of the foreign-exchange deposits to Israeli currency deposits, thereby increasing the liquidity of the banking system and increasing the money supply through the money multiplier with all the implications which that has for aggregate demand and for the price level. In principle these developments could have been countered and offset by a

sufficiently tight fiscal and monetary policy. In the case of Israel, however, a combination of factors which will be discussed later have contributed to making the government unwilling and possibly unable to take measures extreme enough to offset the major fiscal and monetary expansionary effects inherent in a formal devaluation. It was therefore felt that formal devaluations should be used infrequently, while at the same time maintaining Israel's competitive ability by increasing export subsidies as necessary.

TABLE 3.1

FOREIGN-EXCHANGE DEPOSITS OF LOCAL RESIDENTS, 1957-1971

YEAR	END-OF YEAR VALUE (IL million)	RATIO TO MONEY SUPPLY (per cent)	RATIO TO ANNUAL GNP (per cent)
	(1)	(2)	(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	1124	56.0	9.8
1967	1601	63.1	13.4
1968	1924	66.4	13.7
1969	2498	84.1	15.7
1970	3000	88.7	16.3
1971	4783	110.2	21.0

Source: Michaely, Michael, Foreign Trade Regimes & Economic Development:  
Israel, National Bureau of Economic Research, 1971, p. 131.

This fear of monetary explosion took on an extra dimension after January 31, 1958. Up till then, deposits of both Israeli and foreign currencies were treated alike, in that they both required the same bank reserves and thus contributed equally to credit expansion. However, after this date a distinction was made between deposits denominated in Israeli currency for which normal reserve requirements had to be maintained, and those denominated in foreign currency for which 100% reserves were now required.<sup>4</sup> Thus while deposits (from German restitution payments, etc.) of foreign exchange were kept in that form in the special foreign exchange accounts (known in Israel as PAZAK and TAMAM), they would be completely sterilized by the 100% liquidity requirement. If, however, they were to be exchanged for deposits denominated in Israeli currency it would have had an explosive effect on the liquidity of the banking system. The authorities felt that as long as expectations of devaluation were to exist, people would be reluctant to switch into Israeli currency, whereas after a major devaluation this reluctance would be substantially diminished.

Although this desire to avoid explosive monetary growth was certainly a major consideration of the authorities, and undoubtedly helped induce them to avoid formal devaluations,<sup>5</sup> it is certain that there were other considerations reinforcing the desire to avoid formal devaluations as long as possible. These other considerations were by no means unique to Israel, but were of importance even in the developed and industrialized nations during the period of fixed exchange rates prior to 1971.

One major consideration in avoiding formal devaluations was to limit perceived inflation. A formal devaluation would increase the

local price of imported goods (which were and still are a very significant part of total consumption goods), thereby driving up the consumer price index. This in turn would be followed by cost-push price increases as Israeli labor (militant, powerful, and organized) fought to keep up. I refer to this as limiting 'perceived' inflation since in reality the devaluation would be merely confirming previous local inflation and bringing foreign prices in terms of local currency into alignment with the cheaper local currency. Thus price increases brought on by this type of devaluation are not the cause of inflation, but the result of previous inflation. Not devaluing is a subsidy for imports and serves to export abroad part of the local inflation. Nevertheless, appearances are oftentimes more important than reality. A formal devaluation with its perceived inflationary impact could induce serious labor catch-up pressure, and thus its avoidance became desirable. The method used was to avoid formal devaluation for lengthy periods of time, while at the same time abolishing the import subsidy and export penalty by taxing imports and subsidizing exports.

Another consideration behind the policy of avoiding formal devaluations for as long as possible might have been the desire to project an image of a stable country with a stable currency to attract foreign capital inflows. Israel always desired and attempted to attract foreign investments (although its socialistically-oriented beauracracy often succeeded in frustrating this desire), and the knowledge that they could repatriate their holdings at the same rate of exchange would certainly be encouraging to potential foreign investors. Similarly the fear of forthcoming devaluations would tend to discourage foreign investment. Thus a balance had to be struck. Too many devaluations and an image of

an unstable currency is generated. Too few devaluations and devaluation expectations could be generated, which also would be inimical to capital inflows.

Finally, there is the ever-present political aspect. The public often tends to interpret a devaluation as a sign of governmental mismanagement. After all, our currency is getting cheaper and so our government must be doing something wrong. Once again the perception of reality is often more important than the reality itself. If this is how the voting public reacts to formal devaluations then the elected officials will be very reluctant to undertake one. Better to devalue quietly and informally through taxes and subsidies (even with the assorted distortions, inefficiencies, and misallocation of resources that this implies), than risk the ire of an aroused electorate. Thus for all these reasons, in the period prior to the Yom Kippur War formal devaluations were few and far-between, although implicit changes in the exchange rate were continuously taking place.

CHAPTER IV

OVERVIEW OF THE ISRAELI MONETARY EXPERIENCE

From the time of Israel's creation, the State's economy was functioning under conditions of excess demand, caused by an inability to completely finance the heavy security burden and the heavy immigrant absorption burden through taxes, borrowing, and gifts alone. The Bank of Israel had to make up the difference by in effect printing money, which had the usual effects on the banking system through the money multiplier. In addition, by 1958 foreign currency accumulations (in no small part caused by German reparation payments) became another major source of liquidity. The goal of the monetary policy of the Bank of Israel was to try to contain these forces from creating runaway liquidity and high rates of inflation.<sup>1</sup> This goal was not easy for the Bank of Israel to achieve for reasons which we will now turn our attention to.

For most of the period under discussion the only monetary tool available to the central bank was setting the minimum reserve requirements, (the Treasury didn't transfer control of the Short Term Loan to the Bank of Israel for use in open market operations until November 1966) and it was difficult to set the extraordinarily high reserve requirements necessary to control the flood of liquidity. Extremely high reserve requirements resulted in a tendency for financial activities to be undertaken outside the banking system in alternate frameworks over which there was no control at all. This was especially true in the period prior to 1970 when a black money market existed anyway due to the legal ceiling on interest rates.<sup>2</sup>

The extremely high reserve rates that the central bank might have desired to establish was politically very difficult to impose. Obviously,

the banking institutions whose profits would be reduced by higher reserve requirements were firmly opposed to such action. Other sectors of the economy including industry, services, etc. were equally opposed. Each firm and industry would see the economic picture from its narrow micro view. It is trying to grow and expand and for some unclear reason the monetary authorities are trying to make credit difficult to obtain and thus thwart the intended expansion. Of course from the macro point of view there were no real unemployed resources left for the intended expansions and furnishing the desired credit would only drive up the price level. But the affected sectors wouldn't see it from the macro point of view, and they would bring their political clout to bear against the Bank of Israel. In some other countries that kind of pressure wouldn't move the monetary authorities from their intended course by one iota. In Israel, however, everything boils down to politics, clout, whom you know, and how loud you scream. Thus the fear of antagonizing the business community often prevented the Bank of Israel from taking the kind of stringent steps that it desired to, the kind of steps that it knew it really should take for the health of the economy.

The monetary authorities were also constrained by the fear that higher interest rates might attract significant amounts of short term foreign capital (especially in the later years with the liberalization of controls on foreign currency), thus aggravating the very condition they were trying to constrain. This was especially dangerous in periods of time when there was no expectation of devaluation.

Another constraint on the ability of the Bank of Israel to accomplish its goals was the government's credit policy, first established in 1950. That policy consisted of subsidizing preferred sectors of the economy

through a policy of directed credit at artificially low rates of interest, (we will have occasion to return to this policy in greater depth when discussing reserve requirements and how this policy of 'directed credit' affected the liquidity of the banking system and the calculation of its reserve requirements) and was determined not by the central bank but by administrative fiat. Thus, attempts to tighten the rate of growth of liquidity in the economy would only affect free non-directed bank credit. Control of the quantity of directed credit could only be accomplished through long and drawn out negotiations between the Bank of Israel and various government offices. In this manner, every attempt to control the quantity of directed credit became a political struggle between those borrowers who desired to receive this credit and the central bank's desire to restrain it. In many instances this resulted in a compromise unsatisfactory from the point of view of the Bank of Israel.<sup>3</sup>

#### Minimum Reserve Requirements

As has been pointed out, throughout most of Israel's history changes in required reserves was the key tool used by the monetary authorities to regulate monetary growth. Historically, this tool was used as follows:

(1) In November 1950, reserve requirements of 45% were established on checking account balances and time deposits of less than eighteen months duration.

(2) Beginning in March 1951, reserve requirements were raised to 50%, with marginal reserve requirements on additional deposits set at the rate of 75%. This marginal rate was raised to 90% in April of 1952.

(3) The establishment of the Bank of Israel at the end of 1954 brought about several changes in reserve requirement policy. For the

first time, reserve deficiencies were punished by a fine of seven percent of the deficiency. Deposits at the Bank of Israel were included as part of the bank's liquid reserves. It should be noted, however, that till the end of 1957, the Bank of Israel was not actively using minimum reserve requirements as an instrument of monetary policy. Rather it was used as a means of assuring banking stability.

(4) In January 1958 several major changes came into effect. Minimum reserve requirements were made an explicit tool of monetary policy, and the fine for liquidity deficiencies was raised to 10%. Marginal liquidity requirements were raised to 58%, and to 100% on foreign currency deposits (in an attempt to sterilize the large inflows in foreign currency and prevent them from inducing a liquidity explosion), and a maximum limit liquidity exemptions (primarily for directed credit not requiring liquid cover) was set at 20% of total ordinary deposits which required regular liquid reserves.

(5) From 1961 through the mid 1970's both the formal reserve requirements and the level of liquidity exemptions permitted were adjusted upwards and downwards in accordance with the need at the time. By the early 1970's the formal rate had reached 72%.<sup>4</sup>

### Interest Ceilings

An interesting facet of Israel's economy prior to 1970 was the existence of legal ceilings on interest rates. Till 1957 the maximum annual rate was set at 9% in accordance with an Ottoman statute dating back to 1887. In March 1957 the ceiling was raised to 10% for industry and farming, and 11% for credit to other sectors of the economy. This resulted in very low and even negative real rates of interest for most of the years that this ceiling was in effect. Obviously the quantity of

credit demanded far exceeded the quantity supplied at the legally set rate of interest. Under those circumstances we would expect a 'black market' for credit to develop, and this is exactly what took place. During the 1950's a grey market came into existence in which the obligations of both public and private institutions traded at rates of interest substantially above the controlled rate. By the end of the 1950's this practice had become legitimized to such a degree that the banking institutions began acting as brokers by buying and selling these bonds and notes (for a commission, naturally) for their clients, despite the fact that the effective interest rates on these instruments was not in compliance with legal interest ceilings.

The interest ceiling (which were in effect till March 1970) made life more difficult for the Bank of Israel. Since the banking institutions could not avail themselves of the various methods that developed to circumvent the legal restrictions on interest, they had to lend at or below the ceiling rate. These very low and often negative rates of real interest were recognized by potential borrowers as being a free subsidy (which in fact they were), and thus the clamor for additional bank credit was constantly very loud. The banks (which naturally couldn't meet the flood of demand for credit) would claim to their clients that they would be more than happy to extend them additional credit if only the central bank would make it possible by lowering the reserve requirements. So everyone -- banks and customers -- ganged up on the mean Bank of Israel and accused it of 'choking off credit', of 'strangling the economy', etc. etc. These claims were clearly false. It is quite probable that even an infinite amount of credit would not have satisfied the demand at the artificially maintained nominal rate of 11% (why? scenario:

more credit\*\*\* higher rate of inflation\*\*\* lower real rate of interest \*\*\* greater demand for credit). But in Israel political clout carries much more weight than rational economic analysis, and so the central bank found it impossible politically to tighten credit to the extent it felt necessary. In contrast, when the law setting interest ceilings was finally abolished in 1970, claims that the central bank was "choking off credit" stopped being heard. In fact the reverse took place! Instead of contractors screaming that they were getting insufficient credit (at the artificially low rate), now the banks were complaining that not enough people wanted to borrow (at the market rate).<sup>5</sup>

During its existence, the interest rate ceiling made it impossible for the Bank of Israel to pay banks a high enough rate of interest on their excess reserves to give them an incentive not to run a liquidity deficit. After the abolition of the interest ceilings both the payments for excess reserves and the penalties for reserve deficiencies were raised sufficiently to virtually halt the almost casual manner in which banks had been running liquidity deficits in the past. It was thus with a sigh of relief that the Bank of Israel greeted the abolition of interest ceilings, a goal for which it had campaigned for 15 years.

#### Foreign Exchange

Acquiring and maintaining adequate levels of foreign exchange to finance the perennial gap in Israel's balance of payments was always a central objective of the authorities. Success in their objective, however, would bring in its wake sharp liquidity increases from the foreign currency inflow. This problem became particularly severe in the late 1950's when German reparation payments began to assume major proportions. One solution that was devised was the establishing of special accounts

(known as "PAZAK" and "TAMAM") for the sole use of recipients of restitution payments. These accounts paid a high rate of return, were tax free, and were indexed to the exchange rate. (To avoid confusion it should be pointed out that a "PAZAK(B)" account was also set up for non-recipients of restitution payments who had the right to maintain foreign currency deposits for some other reason. This account never equalled 20% of the regular "PAZAK" account). The rapid growth of these accounts proved how successful this method of diverting that potential liquidity. Since they were deposited completely with the Bank of Israel they could not contribute to monetary growth. On the other hand, by the late 60's their value was greater than the monetary base itself, and the central bank was forever devising plots to make it attractive for the owners of these balances to maintain them and not convert them into Israeli Lira.<sup>6</sup> Since expectations of devaluations was an incentive not to convert, the authorities tried to avoid formal devaluations as much as possible. After all, after a devaluation expectations of a upcoming devaluation tend to be weak and people would be more tempted to convert part of their holdings to Israeli Lira accounts (thus adding to the liquidity of the banking system).

#### Open Market Operations

The Israeli Treasury began issuing short-term bills denominated in Israeli currency in July 1960. For the next six years these treasury bills were used simply to raise short-term funds for the government, and they were not utilized at all as a conscious instrument of monetary policy. After years of pressure and pleas from the Bank of Israel an agreement was reached in November 1966 in which the Treasury agreed to turn over control of purchases and sales of these short-term bills to

the central bank.<sup>7</sup> This was a very important advance in the development of monetary control in Israel, since till then the only major policy instrument available was that of manipulating the minimum reserve requirements. One can say without fear of exaggeration that attempts to fine-tune an economy with only one monetary tool are unlikely to meet with overwhelming success. In the case of Israel, the monetary authorities were more concerned with maintaining some control over the economy than in trying to accomplish the impossible dream of fine-tuning it. Thus the receipt of an additional policy instrument was greeted with unbridled enthusiasm by the central bank.

At first open market operations were unable to play the major role that such operations perform in the more developed economies. The underdeveloped state of the Israeli securities market was one major obstacle. In addition, most of the short-term securities sold were bought by households and small firms (and in small denominations). The large financial institutions bought very little of these treasury bills, thus compounding the difficulties of conducting open market operations. The absence of large institutions can be traced to the legal ceiling on interest. Treasury bills in order to be marketable had to pay considerably more than the legal maximum of 11%. In order to circumvent the 11% ceiling, these bills were sold at a discount and their appreciation was considered a capital gain rather than an interest payment. Private individuals were not taxed on capital gain, while financial institutions were. Thus a distortion similar to that of tax-free municipals in the United States was created in Israel, and only those who benefited from the tax savings found it worthwhile to purchase these bills. Nevertheless, despite these start-up difficulties and problems, by the 1970's

open market operations had become an important instrument of Israeli monetary policy.

CHAPTER V

SUBPERIODS OF PAYMENTS IMBALANCES

In this chapter, subperiods in the balance of payments will be used to analyze the response of Israeli policy makers to their payments imbalances. Normally a subperiod of payments imbalance would be a period of time when the balance of payments were continuously in surplus, continuously in deficit, or continuously in rough equilibrium. In the case of Israel, however, the balance of payments was always in deficit from 1948 till the time of this writing. Deficits were expected, planned on, and accepted as normal, as long as they were within reason and could be adequately financed by capital imports and unilateral transfers. Thus for the purposes of this subperiod analysis, we will consider a surplus as a movement towards a smaller deficit and we will call it a "deceleration of the deficit", and a deficit as a movement towards a larger deficit which we will term an "acceleration of the deficit". A neutral subperiod is one whose level of deficit was roughly constant. This method of defining surplus and deficit appears to coincide with that of the Israeli policy makers. Quarterly data is utilized, the subperiods are lagged one quarter behind the policy instruments,<sup>1</sup> and a one quarter divergence from an apparent subperiod trend is ignored as a random fluctuation.

Each subperiod will be analyzed by dissecting the movements of policy instruments and objectives within the subperiod. It is possible, of course, that an instrument may appear to be moving in a direction necessary for balance of payment adjustment as a coincidental result of a movement required to achieve an altogether separate policy objective. Thus it is important to examine the movements of alternate policy

objectives. This type of examination would be helpful in concluding whether what appears to be an association of a particular policy instrument with the balance of payments can be better explained in terms of an association with some different policy objective. Such an investigation will be undertaken towards the end of this chapter, and to a greater extent in the next chapter through the use of the technique of multiple regression.

The policy instruments utilized in this study will be analyzed to make a determination as to whether they reacted to the balance of payments in an adjusting, disadjusting, or neutral manner. The subperiod analysis utilized in this study draws with some modification on the techniques developed by the famous Israeli economist Michael Michaely in his study of the responsiveness of demand policy to the balance of payments of the major world trading countries.<sup>2</sup> As in Michaely's study, an adjusting movement in a policy instrument is defined as a movement which tends to reverse the imbalance, or at least to help mitigate and counteract what would otherwise have been a worse balance of payments position in the absence of that policy action. A disadjusting movement of a policy instrument is one which tends to worsen the imbalance of payments, or which tends to counteract what would otherwise be a tendency towards improvement in the payments position. A neutral movement of a policy instrument will be considered as one that neither improves nor worsens the balance of payments. This could take place in two different manners. A policy instrument could exhibit diverse random fluctuations so that no consistent pattern of adjustment or disadjustment can be ascertained. Alternatively, if a particular policy instrument were observed to be fairly stable over the period in question

(in response to surplus or deficit), that response will also be termed neutral.

As pointed out by Professor Michaely,<sup>3</sup> there is a certain degree of subjectivity and some limitations connected with this procedure of determining policy responses to payments imbalances. Specifically, a policy instrument is considered adjusting if it contributes to a reduction in aggregate demand in response to a movement towards deficit, or contributes towards an increase in aggregate demand in response to a movement towards surplus. But difficulties in discerning between discretionary and automatic responses, between ex-post and ex-ante movements, and the distinction between levels and changes can inject a degree of subjectivity into the analysis.

The problem of automatic responses is especially significant in the case of Israel, as will be clearly demonstrated later. For example, a rise in the level of external reserves (brought about let's say, by a decline in the deficit without a corresponding decline in capital and unilateral transfers) would be reflected in a rise in the money supply, while a decline in the level of external reserves would cause a contraction (or at least a growth-contraction) in the money supply. The unwary eye could interpret these results as signifying a discretionary adjusting policy, although when changes in external reserves are taken into account in the multiple regression analysis it can be shown that the changes in the money supply were mostly automatic and not discretionary. The easy way out of this difficulty is to assume that even in the event of an automatic response, the government could have offset said response had it so desired. It's failure to do so justifies the conclusion that the automatic response was desired by the authorities,

and can therefore be labeled discretionary. It is not altogether certain, however, that this was always true in the case of Israel. In many instances the automatic response was of a magnitude that could have come close to overwhelming the level of countermeasures that the authorities were able and/or willing to undertake. Nevertheless, it is not unreasonable to assume that if adequate countermeasures were seriously desired and strongly implemented they could have successfully counteracted any automatic response.

The problem raised by the difficulty in separating ex-ante and ex-post movements is implicit whenever realized movements of policy instruments (for which data is available) is used as a proxy for the intended movements of the policy instrument by the policy-setters (which is what we are actually trying to measure). This would be somewhat more significant in the case of monetary variables several stages removed from direct control by the authorities, such as credit to the public. It would not exist in areas which the authorities had direct control, such as in setting minimum reserve requirements.

Finally, distinguishing between levels and changes can present an analytical problem. It is possible that a policy instrument might not move in an adjusting fashion because its existing high (or low) level was considered on the part of the authorities to be a sufficient adjustment to the situation. This type of policy reaction is more difficult to detect, but where possible it will be taken into account. Despite these limitations this subperiod approach can yield useful and significant results which might not be clearly recognized if we were confined solely to the formal regression analysis.

Selecting the appropriate subperiods representing payments imbalances

presented some difficulty. For our purposes the best balance of payments measures are those which were of concern to the policy makers, since it is their reactions which are being analyzed. Despite an intensive study of the reports and publications of the policy makers, such as the Bank of Israel, it was not usually clear precisely which balance of payments measure(s) most concerned them. As a result, many of the generally recognized measures of the balance of payments were utilized in the determination of the subperiods of payments imbalances. They include: the balance of payments on current account, the level of external reserves (where an increase represents a surplus and a decrease represents a deficit), and the ratio of external reserves to imports with respect to its movement from a desired level. These balance of payments variables were seasonally adjusted and lagged one quarter. It was hoped that these various measures would be close enough to enable a straightforward selection of appropriate balance of payments subperiods. This was not true in the case of Israel. Large capital inflows and unilateral transfers (i.e., German reparations and restitution to individuals, United Jewish Appeal, U.S. Government grants, etc.) resulted in periods in which Israel had a sharply rising current account deficit concurrent with sharply rising external reserves! Thus two separate tables of subperiods were tested, one based on external reserves, and the other based on the balance of payments on current account. I concluded that Israeli policy makers tended to be more concerned with the level of foreign currency reserves than with the balance of payments and it is this measure which we too will use in the subperiod analysis.

If the balance of payments movement during a particular subperiod is towards an acceleration of the deficit, a letter "D" will be assigned

to that subperiod. If it is moving toward surplus, i.e., a deceleration of the deficit, a letter "S" will be assigned; and if it is stable or fluctuates without a consistent pattern, a letter "N" is assigned.

Symbols are also assigned to the various policy instruments examined during each subperiod of imbalance to indicate their compliance, noncompliance, or neutrality to Israel's balance of payments situation. If the policy instrument moves in a direction which is necessary for balance of payments adjustment a plus sign (+) is recorded. In the event of a policy instrument moving in a direction opposite to that necessary for balance of payments adjustment, a minus sign (-) is recorded. If the policy instrument was neutral to the imbalance of payments (i.e., if its movements were stable or fluctuated with no discernible pattern) an asterisk (\*) is recorded. In Table 5.1 both the movement of the policy instrument is presented, and one of the three symbols is assigned to each instrument for every subperiod.

Subperiod	BOP	Minimum Reserve requirement	Open Market	% Δ MI	% Δ credit to the public	% Δ credit to the government	Fiscal proxy
II 56-IV 57	D	not yet used as a monetary instrument	not in effect	Stable growth *	Stable growth *	Stable growth *	Insufficient comparable data
I 58-I 64	S	Rising -	"	Stable growth *	Stable growth *	Fluctuates *	Fluctuates *
II 64- IV 64	D	Declining -	"	Slow growth +	Slow growth +	Rapid decline +	Budgetary deficit -
I 65- I 66	S	Declining +	"	Slow growth -	Stable growth *	Rapid growth +	Fluctuates *
II 66-III 66	D (recession)	Declining -	"	Negative growth (decline) +	Fast growth -	Slow growth +	Budget deficit -
IV 66-I 68	S	Stable *	"	Fast growth +	Stable growth *	Rapid growth +	Fluctuates *
II 68-IV 69	D	Stable *	Fluctuates *	Slow growth +	Fast growth -	Rapid decline -	Fluctuates *
I 70-III 73	S (Boom)	Rising -	Absorbing -	Fast growth +	Stable growth *	Fluctuates *	Fluctuates *

Before discussing the results of the subperiod analysis, a few words should be said explaining the absence of the discount rate from this discussion. As part of my research effort I flew to Israel and had the pleasure of meeting with some of Israel's top economists, including with three senior economists from the Bank of Israel. It was made clear to me that the discount rate (whether it be measured by the rate itself or by the quantity of discounts) was never used by the Bank of Israel as a tool of monetary policy. Rather, each year estimate would be made as to how much credit exporters would need, and the quantity of rediscounts would be adjusted accordingly. The discount rate itself was kept artificially low which meant that banks were able to extend directed credit towards exporters at what often was negative real rates of interest. In effect the discount window was used as another tool of subsidizing exports and not at all as a tool of monetary policy. If a period of tight money were desired, for example, other monetary instruments would be utilized to accomplish it; the discount rate would remain unaffected. Thus it is not included in the subperiod discussion.

#### Minimum Reserve Requirement

This is by far the most important tool available to the monetary authorities, and for most of the period under discussion it was virtually the only monetary tool available.<sup>5</sup> Prior to January 1958 the minimum reserve requirements were primarily used as a safety device to assure the stability of the banking system. The policy of using required reserves as an instrument of monetary policy was announced in 1957 and went into effect in January 1958.<sup>6</sup> Hence our use of this instrument in the subperiod analysis also begins in 1958.

The evidence would appear at first glance to indicate that the

minimum reserve requirements were not responsive to the balance of payments. For the seven subperiods in which the minimum reserve requirements were used as a monetary tool, in only one did it react in an adjusting manner. In four it responded in a disadjusting manner, and in two it was neutral. On second glance, however, it can be shown that the minimum reserve tool was used not to respond directly to the balance of payments, but to respond indirectly to the balance of payments and directly to the monetary fluctuations induced by the balance of payments. This conclusion will be dramatically confirmed in the next chapter which highlights the results of the regression analysis. In essence what happened was that a good balance of payments subperiod featured massive foreign currency inflows (massive in relation to tiny Israel's ability to absorb) with a resulting explosive growth in bank liquidity. Rather than follow the classic approach and loosen the monetary reins, the monetary authorities had to do everything within their power to avoid being swamped in excess liquidity. Similarly in greater deficit subperiods, the fall in foreign currency reserves caused very sharp declines in local liquidity, much sharper declines than the Bank of Israel desired. Thus it had to lower reserve requirements to restore part of the lost liquidity. Once these induced liquidity changes are taken into account, it becomes obvious that this tool was really not as unresponsive as it first appeared. As was pointed out, this will be shown much more clearly within the formal regression framework.

#### Open Market Operations

It has already been mentioned that open market operations is a relative newcomer to the Israeli scene. In the two subperiods for which data is available, it

was neutral in one (i.e., it tended to fluctuate) and was highly disadjusting during the other. Just as in the case of minimum reserve requirements, this should be taken with a grain of salt. The heavy liquidity absorption during a period of surplus (I 70--III 73) could be interpreted as a response to the sharply increasing liquidity brought about by the accumulation of foreign currency reserves. In the regression study we will demonstrate, however, that this explanation is not confirmed by the available data.

### Money Supply

During the 1956-1973 period the money supply (M1) grew at an average compound rate of 4.0% per quarter. Any subperiods with a rate of growth substantially below that will be considered as being a subperiod of 'tight money'. Subperiods significantly higher in their monetary growth will be classified as 'easy money' subperiods. On this basis it is apparent that the rate of expansion of the money supply lends support to the contention that the Israeli authorities were attempting to conform to the classical 'rules of the game'. In five of the subperiods the rate of change of the money supply moved in an adjusting manner, in two it moved in a neutral fashion, and in only one of the subperiods in a disadjusting fashion. Even the one disadjusting movement is explainable in terms of the decision late in 1964 to vigorously fight the escalating inflation. This decision resulted in the only pre-1973 recession in Israel's history (III 1965-II 1967). It also led to an amazing 1967, the only year in the history of the State that saw complete price stability. The evidence also seems to indicate that monetary policy was manipulated in accordance with the balance of payments to a greater extent during the latter part of the period under study. In the last

four subperiods, which encompasses half the subperiods under study, the money supply moved in an adjusting direction each time.

### Credit to the Public

For the first four subperiods analyzed, the rate of expansion of total credit to the private sector reveals a pattern similar to that of the money supply. The average quarterly rate of growth of this type of credit was 5.2% during the 1956-1973 period. Rates significantly below this level represent tight credit, while rates substantially above represent easy credit (just as in the case of the growth of M1). Just as in the case of monetary growth, the first four subperiods contain only one in which this instrument moved in an adjusting manner. Unlike the money supply which moved in an adjusting manner in all four of the last four subperiods, total bank credit to the public did not demonstrate such good will and did not come close to behaving that consistently. In fact, during the last four subperiods it acted in a disadjusting manner in two and in a neutral manner in two. Overall credit to the public was mostly neutral, acting in an adjusting manner in only one subperiod, in a disadjusting manner in two subperiods, and behaving neutrally in a total of five subperiods. This lack of responsiveness of credit to the public (i.e., to the private sector) is not surprising when it is recalled that this figure includes both free credit (which can be influenced by the activities of the central bank), and directed credit. It has been pointed out that the level of directed credit was set by administrative fiat with several governmental offices having a strong voice in addition to the Bank of Israel. The share of directed credit in total credit to the public was on the rise throughout the period analyzed (reaching roughly 50% by the early 1970's), and this

could help explain why this instrument performed particularly poorly in the last four subperiods presented. The political facts of life in Israel were such that the level of directed credit often bore little if any resemblance to the objectives that the Bank of Israel was trying to accomplish at the time. Thus we would not expect a priori to find this instrument highly correlated with the balance of payments, and our expectations were indeed not disappointed.

#### Credit to the Government

Central bank credit to the government is primarily a function of the government's need for credit (i.e., the remainder of the budgetary deficit that could not be covered by the sale of bonds and notes to everyone except the central bank), and is the result of many considerations in addition to the balance of payments. There seems to be a bias in the direction of adjustment for this instruments. In four of the eight subperiods examined it moved in an adjusting manner, in three in a neutral manner, and in one it behaved in a disadjusting manner. Since this instrument is so dependent on the fiscal posture of the internal budget,<sup>7</sup> it would be more useful to turn our attention to developing a proxy that will more closely approximate fiscal policy than does credit to the government.

#### Fiscal Policy

There is, of course, no direct quarterly data in Israel on the internal budgetary balance, as is the case in most countries. In Israel the problem is further compounded by the lack even of reliable annual data for most of the period under study. Defense expenditures have always been a very major part of the Israeli budget, and yet these expenditures have only been fully and accurately disclosed since the late

1960's. For the period prior to this (it has since been acknowledged) the defense budget reported in the government's public budget was significantly distorted for security reasons.<sup>8</sup> In the absence of useable direct data therefore we will try to measure fiscal movements by constructing a proxy that will hopefully be highly correlated with this policy instrument.

My approach towards estimating fiscal policy on a quarterly basis is to take the total Israeli debt for that quarter (both internal and external) and subtract from that the amount necessary to finance the balance of payments deficit. The remainder presumably supports the internal deficit, and thus is a measure of fiscal policy. Simply measuring internal borrowing alone would not suffice since part of the external borrowing not required to finance the external deficit could also be used to finance the internal deficit. In effect what we want is the sum of the internal debt plus that part of the external debt not needed to finance the external deficit. Practically the most straightforward way of accomplishing this is to take the sum of the change of the internal debt (for a given quarter) plus the change in the external debt after the external debt has been reduced by the deficit on current account and by the foreign exchange savings. The philosophy behind this procedure is simple. We are assuming that the entire internal borrowings support the internal deficit. In addition, the external borrowings (net, of course) can be used to cover the deficit in the balance of payments, to build up foreign exchange balances, and to help cover the internal budgetary gap. Once we remove the first two items, we remain with that portion of external borrowing that was used to help finance the internal deficit. That, added to the level of internal borrowing

gives us a proxy for the change in the internal budgetary balance from quarter to quarter, or in other words, a reasonable proxy for the direction of fiscal policy.

The data itself when analyzed in the subperiod model does not support the hypothesis that fiscal policy was utilized in a manner that was adjusting towards the balance of payments. Of the seven subperiods for which comparable data is available, there was not even one in which this instrument was used in an adjusting manner. In five of the seven subperiods it behaved neutrally, and in two subperiods its behavior was disadjusting. When one considers the whole mix of economic, political, and personal prestige considerations that shape the budgetary process in Israel, these results are not surprising.

#### Policy Mix

In the first chapter we discussed some of the theoretical aspects of appropriate combinations of monetary and fiscal policy to be utilized under various circumstances. To briefly recapitulate, we indicated that when faced with a balance of payments surplus and a domestic boom, monetary expansion combined with fiscal contraction is appropriate. On the other hand, when faced with a combination of recession and external deficit, monetary contraction combined with fiscal expansion would be most appropriate. Other possible situations are more straightforward. In a situation of overemployment and external deficit both monetary and fiscal policy should be addressed to reducing aggregate demand. If it is a time of unemployment combined with external surplus, then both monetary and fiscal policy should be employed to raise aggregate demand.

Israeli response to a domestic boom and external surplus (i.e., deceleration of the deficit) can really be only tested in the last of

the subperiods. Almost full employment with moderate rates of inflation was considered normal and desirable, and thus we would not expect the application of fiscal restraint unless the rate of inflation got completely out of hand. But in the last subperiod we did have an external surplus in combination with an internal boom, and we would expect an expansionary monetary policy and a contractionary fiscal policy. Monetary policy responded appropriately with a fast rate of growth of the money supply, but fiscal policy fluctuated in an ambiguous manner.

The response to a combination of external deficit (i.e., acceleration of the deficit) and internal recession can only be tested in the fifth subperiod, which happens to be a very short one (II 1966--III 1966). The reason for that is the fact that Israel had only one recession in its history (III 1965--II 1967), and this is the only subperiod completely in the recession. Theoretically, under these conditions we would expect monetary contraction combined with fiscal expansion. Once again we find that monetary growth behaved correctly (the money supply actually declined during this period), and this time fiscal policy also cooperated and was expansionary. Of course, one mink does not make a coat, but since we have just these two cases we can at least state that the subperiod data does not contradict the hypothesis that the Israeli authorities did take these theoretical considerations into account when formulating their policy.

### Conclusion

Our subperiod analysis shows a large degree of responsiveness to the balance on the part of monetary growth, and somewhat less in the case of credit to the government. Credit to the public and the fiscal policy proxy were ambiguous to disadjusting, while the direct policy

instruments of minimum reserve requirements and open market operations responded to the balance of payments in a disadjusting manner. Of course, we already pointed out that there could be very good reasons for these results. For example, a balance of payments of surplus could (and in fact did) result in such a massive liquidity inflow that the authorities had to respond with a restrictive monetary policy and vice versa. Separating this out, as well as separating out the policy reactions to the other major policy goals in addition to that of balance of payments equilibria (i.e., price stability, full employment, and economic growth) is not feasible within the context of the subperiod methodology developed in this section. We will attempt to accomplish this in the regression analysis of Chapter VI.

CHAPTER VI

REGRESSION ANALYSIS

In this chapter we will attempt to estimate and quantify the relationship between policy instruments and policy objectives, as well as the tradeoffs of different policy objectives with each other. This is accomplished by developing the relationship between a particular measure or instrument (as a dependant variable) and the declared objectives of the Israeli authorities, namely, price stability, economic growth, full employment, and balance of payments equilibrium. In addition to these explanatory variables, dummy variables are used to control for seasonal factors, devaluations, and wars; and the influence of foreign exchange flows on some of the policy instruments mandated an additional variable to capture these movements.

Multiple regressions were run relating the various policy instruments to the policy objective variables. Various forms of the explanatory variables were experimented with, and some are included in this study. Various time lags were also experimented with, and it was determined that a two quarter lag of the explanatory variables gave a consistently better fit than any other. In other words, policy action at time  $t$  is considered to be a function of the time  $t-2$  level of the objective variables (with the exception of open market operations whose response time was more rapid). This approach is plausible when one considers the various lags involved in gathering data on the indicators, evaluating that data, deciding how to respond, and implementing that decision. This is especially true in the case of Israel where these things move slower than in most other places.

### Independent Variables

These variables reflect the policy goals of most countries, and are also the stated goals of the Israeli authorities. These then are our explanatory variables, since presumably changes in them will cause the policy makers to react through the use of a policy instrument (our dependent variable). Each of these independent or explanatory variables will now be examined individually.

The balance of payments variable representing a payments surplus or deficit is represented by three different measures. The first is termed "BOP 1" and is the ratio of external reserves to that quarter's imports. The second measure is "BOP 2" and is the dollar value of the import surplus. The third is "BOP 3" which is simply BOP 2 minus unilateral transfers. This last is included to test the possibility that Israeli policy makers did not concern themselves overly much with the level of the import surplus, but rather with that portion of the import surplus not covered by foreign gifts. Thus each regression shown in upcoming tables is presented three times, each time with a different measure of the balance of payments. As discussed in the introduction, several forms of each variable were tested but not necessarily presented in these tables. Unlike the other variables (where one final form of the variable was selected and presented) the pivotal position of the balance of payments situation to this study requires a more thorough presentation of some of the measures of the balance of payments that were tested.

The variable GROWTH refers to the percentage change in the Index of Industrial Production from the same quarter one year earlier. It would have been preferable to use G.N.P. data, but unfortunately G.N.P. on a

quarterly basis is only available from 1964, and even the data for the period 1964-1967 is under dispute in Israel and was not confirmed by the Central Bureau of Statistics.<sup>1</sup> It should be recalled that the Israeli policy makers also did not have any other source of quarterly growth data on which to base their decisions during this period.

Inflation is simply the percentage change in the Consumer Price Index. Unemployment refers to the ratio of those unemployed and actively seeking work to the entire civilian labor force. Comparable data is only available from 1960 on, since in 1959 the system of unemployment registration was changed. Therefore this explanatory variable is omitted from those regressions that include periods prior to 1960.

So far we have covered the four major policy goals, namely, price stability, high rate of growth, low unemployment, and balance of payments equilibrium. In addition some other variables had to be included for statistical reasons. One such variable is labeled "FOREIGN CURRENCY" in the regression tables, and it represents the percentage change of gross external reserves over the previous quarter. This will turn out to be important in certain cases in explaining fluctuations in the dependent variable (i.e., monetary change) not explained by the four policy goals. This particular form of measuring foreign currency changes was chosen since it is the least correlated with the balance of payments from amongst those experimented with. And finally, we also had to include seasonal dummies to correct for seasonal fluctuations, as well as war and devaluation dummies to correct for wars and devaluations. The contribution of these dummies is presented separately from that of the explanatory variables in the regression tables.

### Dependent Variables

The dependent variables are the instrument variables which the authorities manipulate to achieve their policy objectives, and which therefore respond to movements in the policy objective variables. In this section we will analyze the general credit controls of the Bank of Israel and compare these results with the subperiod analysis. These general credit controls include the minimum reserve ratio and the open market rate (as discussed in Chapter IV the discount rate was not used as a monetary tool, and thus is not included in the regressions). They represent the most discretionary tools available to the central bank, and they can be manipulated comparatively fast. A bit later we will apply the regression analysis to the other policy instruments, which are also under the control of the authorities but not in as direct a manner as the minimum reserve ratio and open market operations. Ordinary least square regression equations are estimated for these variables except where indicated by footnotes. In those cases (indicated by footnotes) where serial correlation of the residuals was serious, the equations were adjusted by the Cochrane-Orcutt Iterative Technique. In most cases this was not necessary, however. Each table presented contains the 'F' statistic in parentheses directly underneath the regression coefficient of that variable. At the bottom of each table I have included for easy reference the F value at the 5% level of significance for the appropriate degrees of freedom, so that the reader can tell at a glance which of the coefficients are significant and which are not. In addition, each equation has its  $R^2$ , and standard error of the estimate presented. Since we are primarily interested in the explanatory power of the independent variables, the last two columns of each table break down the

total  $R^2$  showing what share is attributable to the various dummies discussed above, and what share can actually be ascribed to the explanatory variables themselves.

#### Minimum Reserve Requirements

For reasons explained in Chapter IV, our analysis of this policy instrument begins with 1958.<sup>2</sup> It is important to recall that changes in the formal rate alone are not sufficient to accurately describe the operation of this instrument. The reason for that is that throughout the period under study (and in fact prior to and after this period also) a policy of directed credit to preferred sectors was pursued. In order to encourage this credit, banks were given liquidity exemptions on these loans so that a certain fraction of their deposits would not be subject to the formal reserve requirements. Thus the true posture of this monetary tool cannot be determined from the formal minimum reserve requirements alone, but must also take into account the level of liquidity exemptions. What I have done is simply to adjust the formal rate by the ratio of liquidity exemptions to the level of total deposits. The resulting reserve rate is sensitive to both the formal rate and the level of liquidity exemptions, and it is this calculated reserve rate that is used in the regressions.

The results for the period as a whole (Table 6.1) clearly demonstrate a very significant relationship between BOP 2 (the level of the import surplus) and the minimum reserve requirements. When looking at later subperiods such as 1960-1971 (Table 6.2) and 1965-1971 (Table 6.3), this relationship with the balance of payments is further reinforced. UNEMPLOYMENT was also a significant variable (as indeed it was since during Israel's only recession during the period under study the formal

reserve requirements were lowered), and during the later subperiods (starting in 1960), there is also a significant relationship between minimum reserve requirements and the growth variable.

There are two interesting phenomena worth noting in this connection. Although the  $R^2$  are high (reaching .89 in the 1965-1971 period) and the F values indicate a degree of significance beyond any doubt whatsoever (99.9999999999+%), the signs of the coefficients are the exact opposite of our theoretical expectations.

TABLE 6.1  
MINIMUM RESERVE REQUIREMENTS<sup>3</sup>  
(1958-1971)

(t)	(t-2)							t		R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Variable
	Constant Term	BOP1	BOP2	BOP3	Growth	Inflation	Unemploy- ment	Foreign Currency					
Minimum Reserve	1.7 (1.3)				-0.0 (0.0)	-0.7 (0.6)		0.2 (2.8)	.10	8.7	.05	.05	
Minimum Reserve	48.2		-0.2 (61.2)		-0.1 (0.4)	0.9 (1.8)		0.1 (1.6)	.60	5.8	.03	.57	
Minimum Reserve	33.0			-0.0 (0.5)	-0.1 (0.2)	-0.5 (0.2)		0.1 (1.7)	.08	8.8	.03	.05	

Number of observations = 56

5% F = 4.1

Note: BOP1 = Ratio external reserves/imports  
 BOP2 = \$(millions) of import surplus  
 BOP3 = BOP2 - unilateral transfers

TABLE 6.2<sup>4</sup>

MINIMUM RESERVE REQUIREMENTS  
(1960-1971)

(t) Dependent Variable	Constant Term	BOP1	BOP2	BOP3	(t-2) Growth	Inflation	Unemploy- ment	<sup>t</sup> Foreign Currency	R <sup>2</sup>	See	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Variable
Minimum Reserve .	27.0	7.7 (29.7)			-0.2 (3.2)	-1.0 (1.5)	-2.3 (17.0)	0.6 (0.3)	.50	6.4	.10	.40
Minimum Reserve	56.8		-0.2 (72.9)		-0.2 (6.3)	0.9 (1.8)	-1.5 (13.9)	-0.1 (2.0)	.70	5.0	.02	.68
Minimum Reserve	44.8			-0.5 (4.9)	-0.4 (4.9)	-0.1 (0.0)	-1.9 (6.8)	-0.1 (1.1)	.20	8.1	.02	.18

Number of observations = 48

5% F = 4.1

Note: BOP1 = Ratio external reserves/imports

BOP2 = #(millions) of import surplus

BOP3 = BOP2 - unilateral transfers

TABLE 6.3

MINIMUM RESERVE REQUIREMENTS  
(1965-1971)

(t) Dependent Variable	Constant Term	(t-2)					Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Variable	
		BOP1	BOP2	BOP3	Growth	Inflation						Unemploy- ment
Minimum Reserve	76.3		-0.3 (67.5)		-0.4 (17.3)	0.1 (0.0)	-2.8 (20.4)	0.0 (0.2)	.82	4.3	0.04	.78
Minimum Reserve	15.6	10.6 (127.4)			-0.4 (14.1)	-0.8 (1.2)	-2.1 (22.1)	0.0 (0.0)	.89	3.3	0.24	.65
Minimum Reserve	33.7			-0.1 (0.5)	-0.4 (1.2)	0.6 (0.1)	-0.7 (0.2)	-0.1 (0.8)	.13	9.4	0.04	.09

Number of observations = 28

5% F = 4.45

Note: BOP1 = Ratio external reserves/imports

BOP2 = #(millions) of import surplus

BOP3 = BOP2 - unilateral transfers

TABLE 6.4<sup>5</sup>

MINIMUM RESERVE REQUIREMENTS  
(1958-1964)

(t) Dependent Variable	Constant Term	(t-2)						t Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Variabl
		BOP1	BOP2	BOP3	Growth	Inflation	Unemploy- ment					
Minimum Reserve	33.7			0.2 (9.4)	0.3 (11.0)	-0.2 (0.4)	0.0 (0.0)	.66	2.5	.28	.38	
Minimum Reserve	32.5		0.0 (0.3)		0.3 (9.3)	-0.4 (0.7)	0.0 (0.3)	.49	3.1	.28	.21	
Minimum Reserve	35.6	-0.9 (1.2)			0.3 (9.0)	-0.3 (0.4)	-0.9 (1.2)	.51	3.0	.22	.29	

Number of observations = 28

5% F = 4.4

Note: BOP1 = Ratio external reserves/imports

BOP2 = \$(millions) of import surplus

BOP3 = BOP2 - unilateral transfers

For example, when observing BOP1 (the ratio of external reserves to imports), one would expect a priori that the higher the level of external reserves the lower would be the effective minimum reserve requirements. One would therefore expect this coefficient to be negative. Similarly, when observing BOP2 (the dollar level of the import surplus) we would expect a priori that the greater the deceleration of the deficit the higher the necessary minimum reserve requirements, and thus a positive (i.e., +) relationship should exist between the independent and dependent variables. A glance at the tables shows that the actual results were exactly the opposite (in terms of the signs of the coefficients) from those which we would have expected. This unusual situation coincides perfectly with the subperiod analysis of Chapter V, which generated equally unusual results. The explanation for this phenomena lies in the minute size of the Israeli economy, and the overwhelming effect of foreign currency flows on the level of internal liquidity. Of course large foreign currency inflows and a healthy level of foreign exchange reserves led to a desire for an easier credit policy on the part of the authorities. But these very inflows generated such a huge amount of liquidity relative to Israel's small size, that the amount of liquidity grew to exceed (often substantially) even the liberal amounts desired by the authorities. Therefore effective reserve requirements had to be raised in spite of (or rather because of) the large foreign currency inflows. Similarly, major outflows of foreign currency often decreased internal liquidity even more than was necessitated by a tight money policy, thereby inducing the authorities to reduce the effective reserve requirements.

The second interesting phenomena is the results of the 1958-1964 subperiod (Table 6.4), which is completely at variance with the overall period and with later subperiods. In this case the measures BOP1 and BOP2 which were so significant during the other time periods analyzed are clearly not significant at all during this early period. But strangely enough there appears to be some relationship between the dependent variable and BOP3 (dollar level of import surplus minus unilateral transfers). The suggestion is that during this early period the authorities did not respond primarily to the current account deficit, but to that portion not covered by unilateral transfers. We will return to this in greater detail in Chapter VII.

#### Open Market Operations

As previously mentioned, the Bank of Israel did not begin to undertake open market operations until the end of 1966, and therefore the only time period for which regressions were run (Table 6.5) is 1967-1973. The data base on which these regressions were run consists of the amount of liquidity added or absorbed each quarter by this policy instrument.<sup>6</sup> Table 6.5 shows the results with no time lag at all, on the assumption that this is a very rapidly responding tool compared to others. It wouldn't have made much difference anyway because regardless what lag I experimented with, the results were equally poor. These results reinforce and clarify the somewhat ambiguous results obtained by the subperiod method of Chapter V (especially since we only had two subperiods to analyze). Clearly the portion of the variation in open market operations explained by the standard four policy goals is less than 5%, or in other words the traditional policy objectives clearly do not explain at all the recorded changes in open market operations.

TABLE 6.5

OPEN MARKET OPERATIONS  
(1967-1973)

(t) Dependent Variable	Constant Term	(t-0 = t)						t Foreign Currenty	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies Vari	ΔF Vari
		BOP1	BOP2	BOP3	Growth	Inflation	Unemploy- ment					
Open Market	-44.1	15.1 (1.9)			-1.5 (5.2)	1.1 (0.0)	-2.5 (0.3)	-0.8 (2.8)	.66	26.8	.61	.0
Open Market	52.3		-0.4 (0.6)		-1.9 (3.2)	4.5 (0.5)	-4.9 (0.3)	-0.7 (2.1)	.63	28.1	.60	.0
Open Market	-21.7			-0.2 (1.1)	-1.5 (4.9)	0.5 (0.0)	-0.4 (0.0)	-0.8 (2.4)	.64	27.7	.60	.0

Number of observations = 26

5% F = 4.5

Note: BOP1 = Ratio external reserves/imports

BOP2 = \$(millions) of import surplus

BOP3 = BOP2 - unilateral transfers

The interpretation of these results is not completely clear. It would seem, however, that in the early years of the existence of this tool the Bank of Israel (as a result of the underdeveloped state of the Israeli securities market) was primarily interested in achieving a wide distribution of the Short Term Loan (the treasury bill used for these open market operations), and thus was biased in the direction of (what we would pick up as) absorptive operations, i.e., selling these bills wherever possible. Also, we pointed out in Chapter IV that an additional complication existed in that large financial institutions refused to purchase these bills in significant quantities (and often in any quantities at all). This was the result of the legal ceiling on interest rates, which forced these bills to carry a face interest of 11%. They therefore had to be sold at a discount to be competitive (since free market rates of interest were between 15-18 percent), and their appreciation was considered (to save face) not an interest payment but a capital gain.<sup>7</sup> Institutions were taxed on capital gains (while individuals were not) thus making them very reluctant to help the central bank accomplish its objective of wide distribution of the short term loan. It is conceivable that the short time period that this instrument was utilized combined with the difficulties in getting it started can help explain its poor showing in the regressions.

#### Monetary Growth

The remainder of the policy tools which we will analyze in the course of this chapter (and starting with monetary growth) were not as directly under the control of the Bank of Israel as the two just discussed. Nevertheless in each case except for fiscal policy the Bank of Israel had a great degree of influence on fluctuations of those policy

instruments.

When running regressions with the change in the money supply as the dependent variable, it is possible on occasion to generate coefficients with misleading signs. The reason for this is that a tight money policy usually does not imply a decline in the money supply itself, but rather a decline in the rate of growth of the money supply. To filter out this confounding effect whenever it shows up, I have run each of the monetary regressions in two forms--both of which are presented in each of the monetary tables (Tables 6.6-6.9). The first method (in which the dependent variable is labeled "M") was to use the percentage change in the level of M1 over the previous quarter. The other method (labeled "dM") was to take the percent change in the rate of growth of M1. In the second case, a slow-down in the rate of growth of the money supply would appear in the data base as a negative number and thereby hopefully prevent us from getting the wrong sign (at least for that reason).

In the early period of 1956-1963 (Table 6.6) the use of "dM" as the independent variable dramatically improved the results obtained. In the other time periods which we will examine, it made almost no difference at all. During this 1956-1963 period  $R^2$ 's as high as .85 were generated, a result almost unbelievably high for a policy instrument substantially removed from being completely under the control of the monetary authorities. However, a closer look shows why this is the case. None of the balance of payments variables tested in Table 6.6 are significant. The rate of inflation also is not significant (but even so, it is encouraging to note that when switching from the use of "M" as the independent variable to "dM" the inflation coefficient

TABLE 6.6

MONEY SUPPLY  
(1956-1963)

(t)		(t-2)						t				
Dependent Variable	Constant Term	BOP1	BOP2	BOP3	Growth	Inflation	Unemploy- ment	Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Var:
M	4.8	0.3 (0.4)			-0.2 (7.8)	0.3 (0.9)		0.1 (6.5)	.70	2.4	.33	.3
M	9.0		-0.1 (3.4)		-0.2 (10.1)	0.5 (2.3)		0.1 (8.9)	.73	2.2	.36	.3
M	5.3			-0.1 (1.2)	-0.2 (8.4)	0.3 (1.1)		0.1 (7.1)	.71	2.3	.36	.3
dM	0.1	-0.1 (0.0)			-0.2 (12.2)	-0.2 (0.6)		0.1 (20.4)	.84	2.2	.12	.7
dM	1.7		-0.0 (0.7)		-0.2 (13.3)	-0.2 (0.4)		0.1 (21.9)	.85	2.2	.13	.7
dM	0.1			-0.1 (0.5)	-0.2 (12.9)	-0.3 (0.7)		0.1 (21.6)	.85	2.2	.13	.7

Number of observations = 32  
5% F = 4.3

M = % Δ in M1 over previous quarter  
dM = % Δ in rate of growth of M1

Note: BOP1 = Ratio external reserves/imports  
BOP2 = \$(millions) of import surplus  
BOP3 = BOP2 - unilateral transfers

TABLE 6.7  
MONEY SUPPLY  
(1956-1973)

(t) Dependent Variable	Constant Term	(t-2)					Unemploy- ment	t Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Vari
		BOP1	BOP2	BOP3	Growth	Inflation						
M	4.0	0.0 (0.0)			-0.1 (8.5)	0.7 (7.3)		0.1 (12.2)	.56	2.7	.22	.34
M	3.5		0.0 (0.8)		-0.1 (8.8)	0.5 (3.2)		0.1 (12.1)	.56	2.7	.22	.34
M	4.1			-0.0 (2.2)	-0.1 (10.0)	0.6 (8.3)		0.1 (13.7)	.57	2.7	.22	.35
dM	-2.3	0.1 (0.0)			-0.1 (1.0)	0.1 (0.1)		0.1 (7.7)	.58	3.3	.26	.32
dM	-3.3		0.0 (2.8)		-0.1 (1.2)	-0.2 (0.4)		0.1 (7.4)	.59	3.2	.26	.33
dM	-2.1			-0.0 (0.2)	-0.1 (1.1)	0.1 (0.1)		0.1 (8.0)	.58	3.3	.26	.32

Number of observations = 70  
 5% F = 4.0  
 M = % Δ in M1 over previous quarter  
 dM = % Δ in rate of growth of M1

Note: BOP1 = Ratio external reserves/imports  
 BOP2 = \$(millions) of import surplus  
 BOP3 = BOP2 - unilateral transfers

TABLE 6.8

MONEY SUPPLY  
(1960-1973)

(t) Dependent Variable	Constant Term	(t-2)					t		R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Varia
		BOP1	BOP2	BOP3	Growth	Inflation	Unemploy- ment	Foreign Currency				
M	2.8	-0.4 (0.4)			-0.1 (1.7)	0.7 (4.4)	0.3 (1.2)	0.1 (7.0)	.53	3.0	.14	.39
M	-1.8		0.0 (0.3)		-0.4 (0.3)	0.4 (0.9)	0.5 (2.3)	0.0 (0.1)	.58	3.4	.38	.20
M	2.7			-0.0 (1.0)	-0.1 (2.5)	0.7 (4.2)	0.2 (0.4)	0.1 (7.3)	.53	2.9	.03	.50
dM	-0.3	0.1 (0.0)			-0.1 (1.6)	-0.2 (0.2)	-0.3 (1.1)	0.1 (1.6)	.54	3.5	.29	.25
dM	-2.1		0.0 (2.3)		-0.5 (0.6)	-0.4 (1.1)	-0.2 (0.6)	0.1 (1.8)	.57	3.4	.28	.29
dM	0.3			-0.0 (0.5)	-0.1 (1.5)	-0.2 (0.2)	-0.4 (1.5)	0.1 (1.5)	.55	3.5	.28	.27

Number of observations = 54

5% F = 4.1

M = % Δ in M1 over previous quarter

dM = % Δ in rate of growth of M1

Note: BOP1 = Ratio external reserves/imports

BOP2 = \$(millions) of import surplus

BOP3 = BOP2 - unilateral transfers

TABLE 6.9

MONEY SUPPLY  
(1964-1973)

(t) Dependent Variable	Constant Term	(t-2)						t Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Vari
		BOP1	BOP2	BOP3	Growth	Inflation	Unemploy- ment					
M	0.6	-0.8 (1.1)			-0.0 (0.1)	1.1 (7.6)	0.6 (3.4)	0.1 (7.2)	.60	2.9	.17	.43
M	-6.9		0.04 (7.1)		0.0 (0.0)	0.6 (1.9)	0.9 (8.1)	0.1 (6.6)	.67	2.6	.17	.50
M	-0.1			-0.0 (0.3)	-0.0 (0.3)	1.0 (6.4)	0.4 (1.5)	0.1 (8.1)	.59	2.9	.17	.42
dM	-2.4	0.4 (0.2)			-0.0 (0.0)	0.2 (0.1)	-0.3 (0.5)	0.1 (2.1)	.55	3.7	.39	.16
dM	-3.2		0.0 (0.2)		0.0 (0.0)	0.1 (0.0)	-0.1 (0.1)	0.1 (1.7)	.55	3.7	.39	.16
dM	-0.8			-0.0 (0.5)	-0.0 (0.1)	0.1 (0.0)	-0.3 (0.7)	0.1 (2.0)	.55	3.6	.39	.16

Number of observations = 38

5% F = 4.2

M = % Δ M1 over previous quarter

dM = % Δ in rate of growth of M1

Note: BOP1 = Ratio external reserves/imports

BOP2 = \$(millions) of import surplus

BOP3 = BOP2 - unilateral transfers

assumes the "correct" sign, i.e., it becomes negative). The explanation for the high  $R$  squared during this period lies in the major contributions of the GROWTH variable and the FOREIGN CURRENCY variable. Both have high  $F$  values and both contribute substantially to the final  $R$  squared. The FOREIGN CURRENCY variable is the percentage change in gross external reserves over the previous quarter, and is included to filter out the effect (which was a major one, as has been pointed out) of foreign currency inflows and outflows on internal liquidity. With this effect now accounted for, we are left with the conclusion that during the 1956-1963 period the primary consideration of the policy makers was that of economic growth. This conclusion is consistent with the stated goals of the authorities at the time.

For the period as a whole (Table 6.7) as well as for later subperiods, nothing is gained by using "dM" as our dependent variable, and we will focus our discussion on "M". Our  $R$  squared for the entire 1956-1973 period ranges in the upper fifties, and is therefore much closer to what we would expect than the high eighties of the early subperiod, when one considers the many factors influencing monetary growth. Once again as in the 1956-1963 subperiod, the balance of payments (regardless which measure is adopted) plays no role in explaining policy decisions. This time it is GROWTH, FOREIGN CURRENCY, and INFLATION which are significant (although the equation as a whole is much less significant than those generated for the 1956-1963 subperiod). The first two have been dealt with already in the previous context. In the case of the INFLATION variable it appears to be significant both in the overall period and in the later subperiods (Tables 6.8 and 6.9). The problem however is that throughout it has a positive coefficient instead of the

negative coefficient we would theoretically expect. This though is not too serious since in almost every case the corresponding regression with "dM" gives the "correct" coefficient (and in those cases where it doesn't, its F value is roughly 0.0 which doesn't induce us to take it very seriously). Thus it would seem that for this period as a whole we can accept the significance of the INFLATION explanatory variable despite the positive coefficients, and we can ascribe those coefficients to the fact that monetary restraint takes the form of a slower rate of growth of the money supply and not a negative rate of growth.

The later subperiods also include the explanatory variable UNEMPLOYMENT (i.e., the 1960-1973, and 1964-1973 subperiods). In only one regression (see Table 6.9) does this variable assume statistical significance. It is probable that the very success of the Israeli authorities in keeping unemployment very low and within acceptable limits (there was only one recession during the entire 1956-1973 period under study) prevented its showing up as very significant; since fluctuations within acceptable limits could safely be ignored by policy setters. Only in the 1964-1973 subperiod, which includes Israel's major two-year recession (1965-1966) do we get a case of statistical significance for this variable.

As for the balance of payments, only in the 1964-1973 period did one of the balance of payments measures assume statistical significance (we will discuss a possible reason for this in Chapter VI). This is in surprisnly close agreement with the subperiod analysis of Chapter IV where almost all the positive results took place in these later years.

TABLE 6.10

CREDIT TO THE PUBLIC  
(1956-1973)

(t) Dependent Variable	Constant Term	(t-2)					t Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Variat
		BOP1	BOP2	BOP3	Growth	Inflation					
CP	7.6	-0.5 (0.4)			-0.0 (0.1)	0.1 (0.1)	-0.1 (3.5)	.22	5.4	.15	.07
CP	6.5		0.0 (0.7)		-0.0 (0.0)	-0.1 (0.0)	-0.1 (3.3)	.22	5.4	.14	.08
CP	6.5			-0.0 (0.0)	-0.0 (0.0)	0.1 (0.1)	-0.1 (3.0)	.21	5.4	.14	.07

Number of observations = 70  
5% F = 4.0

Note: BOP1 = Ratio external reserves/imports  
BOP2 = \$(millions) of import surplus  
BOP3 = BOP2 - unilateral transfers

TABLE 6.11  
CREDIT TO THE PUBLIC  
(1956-1963)

(t) Dependent Variable	Constant Term	(t-2)						<sup>t</sup> Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Variab
		BOP1	BOP2	BOP3	Growth	Inflation	Unemploy- ment					
CP	9.1	-1.8 (2.3)			0.0 (0.0)	-0.4 (0.3)		-0.1 (1.6)	.26	5.2	.06	.20
CP	15.8		-0.1 (3.5)		-0.0 (0.0)	-0.2 (0.0)		-0.1 (0.5)	.29	5.1	.04	.25
CP	6.8			-0.0 (0.0)	0.0 (0.0)	-0.5 (0.4)		-0.1 (1.0)	.18	5.5	.04	.14

Number of observations = 32

5% F = 4.3

Note: BOP1 = Ratio external reserves/imports

BOP2 = \$(millions) of import surplus

BOP3 = BOP2 - unilateral transfers

TABLE 6.12  
CREDIT TO THE PUBLIC  
(1964-1973)

(t) Dependent Variable	Constant Term	(t-2)					Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔI Var	
		BOP1	BOP2	BOP3	Growth	Inflation						Unemploy- ment
CP	6.1	-2.1 (3.0)			-0.0 (0.0)	0.9 (2.2)	0.9 (3.1)	-0.1 (3.3)	.58	4.6	.41	.17
CP	-2.7		0.0 (1.6)		0.0 (0.0)	0.5 (0.4)	0.9 (1.2)	-0.1 (3.0)	.56	4.7	.40	.16
CP	2.7			-0.0 (0.0)	-0.0 (0.0)	0.9 (1.8)	0.6 (1.1)	-0.1 (2.2)	.53	4.9	.40	.15

Number of observations = 38  
5% F = 4.2

Note: BOP1 = Ratio external reserves/imports  
BOP2 = \$(millions) of import surplus  
BOP3 = BOP2 - unilateral transfers

TABLE 6.13  
CREDIT TO GOVERNMENT  
(1956-1973)

(t) Dependent Variable	Constant Term	(t-2)					t Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Variab.
		BOP1	BOP2	BOP3	Growth	Inflation					
CG	-23.9	-35.6 (1.7)			3.1 (1.0)	-17.6 (0.9)	-2.8 (2.3)	.29	209.6	.24	.05
CG	-252.3		2.1 (14.0)		3.0 (1.1)	-45.9 (5.8)	-2.8 (2.9)	.41	190.8	.23	.18
CG	-112.2			2.7 (5.4)	4.4 (2.0)	-22.5 (1.5)	-2.6 (2.3)	.33	203.2	.23	.10

Number of observations = 68  
5% F = 4.0

Note: BOP1 = Ratio external reserves/imports  
BOP2 = \$(millions) of import surplus  
BOP3 = BOP2 - unilateral transfers

TABLE 6.14  
CREDIT TO GOVERNMENT  
(1956-1963)

(t) Dependent Variable	Constant Term	(t-2)					Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Variable
		BOP1	BOP2	BOP3	Growth	Inflation					
CG	-71.9	-1.2 (0.0)			1.9 (2.0)	-4.7 (0.6)	-1.2 (4.5)	.69	44.7	.65	.04
CG	-89.8		0.2 (0.2)		1.8 (1.6)	-4.3 (0.5)	-1.2 (4.4)	.68	44.9	.65	.03
CG	-73.5			0.4 (0.1)	1.7 (1.6)	-3.7 (0.4)	-1.2 (4.4)	.68	45.0	.65	.03

Number of observations = 32  
5% F = 4.3

Note: BOP1 = Ratio external reserves/imports  
BOP2 = \$(millions) of import surplus  
BOP3 = BOP2 - unilateral transfers

TABLE 6.15  
CREDIT TO GOVERNMENT  
(1960-1973)

(t) Dependent Variable	Constant Term	(t-2)						t Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Variable
		BOP1	BOP2	BOP3	Growth	Inflation	Unemploy- ment					
CG	-1723.2	-87.9 (0.0)			20.7 (0.2)	1148.5 (14.6)	147.7 (0.3)	-25.0 (0.4)	.31	2780.0	.13	.18
CG	-3706.4		16.3 (3.7)		26.2 (0.3)	848.1 (6.7)	225.8 (0.9)	-22.7 (0.3)	.36	2668.1	.14	.22
CG	-1300.8			-17.7 (1.1)	2.6 (0.0)	1134.2 (14.6)	63.5 (0.1)	-28.0 (0.5)	.33	2746.4	.14	.19

Number of observations = 54  
5% F = 4.1

Note: BOP1 = Ratio external reserves/imports  
BOP2 = \$(millions) of import surplus  
BOP3 = BOP2 - unilateral transfers

TABLE 6.16  
CREDIT TO GOVERNMENT  
(1964-1973)

(t) Dependent Variable	Constant Term	(t-2)						<sup>t</sup> Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Variable
		BOP1	BOP2	BOP3	Growth	Inflation	Unemploy- ment					
CG	-3241.7	-0.9 (0.0)			46.9 (0.4)	1439.6 (10.5)	252.7 (0.5)	-18.0 (0.1)	.36	3347.9	.12	.24
CG	-8499.7		31.8 (3.6)		72.6 (1.1)	1008.6 (4.5)	595.4 (2.7)	-37.9 (0.6)	.43	3147.4	.13	.30
CG	-2287.0			-16.2 (0.5)	22.8 (0.1)	1368.6 (9.2)	144.9 (0.2)	-19.2 (0.1)	.37	3315.1	.11	.26

Number of observations = 38  
5% F = 4.2

Note: BOP1 = Ratio external reserves/imports  
BOP2 = \$(millions) of import surplus  
BOP3 = BOP2 - unilateral transfers

Credit: To the Public & to the Government

Credit to the public refers to the percent change of total credit to the public by the banking system over the previous quarter. Credit to the government refers to the percent change in total credit to the government by the banking system over the previous quarter. The results of both dependent variables are presented (for the 1956-1973 period as a whole as well as for various subperiods) in Tables 6.10-6.16. In both cases the results do not indicate any significant relationship between the balance of payments (however measured) and the dependent variable, regardless of the time period under study. In the case of credit to the public, the regression results are clearly consistent with the negative findings of the subperiod analysis. However, the subperiod analysis did tend to indicate more of a responsiveness to the balance of payments than is indicated by the regression results. Other than the balance of payments, the other independent variables tested also proved to be insignificant in explaining variations in credit. The one exception was the case of credit to the government in the period after 1960. In that instance (Tables 6.15 and 6.16) there does seem to be some association between the level of inflation and credit to the government. A priori, however, we would have expected the inflation coefficients to be negative, meaning the worse the inflation the less credit is granted. The actual coefficients were positive -- meaning the higher the inflation rate the more credit was granted. It appears that we might be picking up the Israeli policy of utilizing supplementary budgets. If during a fiscal year it became apparent that expenditures were running at too rapid a rate compared to the initial budget authorization, the government (instead of cutting back) would present a supplementary budget which would

authorize additional expenditures. Thus a higher than anticipated rate of inflation often resulted in higher than anticipated expenditures (not offset by equally higher tax collection) and this could have necessitated higher government borrowing. This scenario makes the positive inflation coefficients seem somewhat less absurd.

### Fiscal Policy

In Israel, as was mentioned previously, not only is there no quarterly fiscal data, but there also isn't reliable annual data for most of the period under study. Although defense expenditures have always been a major part of Israel's budget, they have only been accurately disclosed since the late 1960's. It has been since acknowledged that the public budgets published by the government prior to the late 1960's were significantly distorted for security reasons. Thus any insight into the direction of fiscal policy must come through the use of a fiscal policy proxy.

The fiscal proxy developed in the subperiod section in Chapter V is utilized in this chapter as the dependent variable of the multiple regression analysis. To briefly review, we took the sum of the change of the internal debt plus the change in the external debt (after deducting from the external debt the deficit on current account and the change in foreign exchange holdings). The reasoning behind this procedure is straightforward. External borrowings can be used to cover the deficit in the balance of payments, to accumulate foreign exchange balances, or to help finance the internal budgetary deficit. Presumably whatever portion of the external borrowings is not being used to cover the balance of payments deficit or to increase the sum of foreign exchange holdings is being used to help cover the internal deficit. If we add to this the amount of

internal borrowing (which presumably is being used in its entirety to finance the internal deficit), we have a proxy for excess internal demand on a quarterly basis -- i.e., a quarterly estimate of fiscal policy.<sup>8</sup> The reason we are focusing on changes rather than levels is that we are attempting to capture not the absolute magnitude of the internal deficit or surplus, but rather the direction of movement. For example, a movement from a large internal deficit to a smaller one would be considered a contractionary movement towards surplus despite the fact that we still would be in a situation of excess government demand.

The results of the regression study (to make use of comparable data the maximum overall period was 1957-1972) using the fiscal policy proxy as the dependent variable are shown in Table 6.17-6.20. Regardless which time period we examine, be it the entire period or various subdivisions of it, the results are clear and unambiguous. There is not only no significant relationship between the fiscal proxy and the various measures of the balance of payments, but there is also no significant relationship between fiscal policy and any of the explanatory variables tested. This is fully consistent with the subperiod results of Chapter V in which it was determined that there was not even one subperiod in which fiscal policy moved in an adjusting manner with respect to the balance of payments. The regression study not only confirms these results dramatically, but demonstrates in addition that there was no statistically significant relationship between fiscal policy and any of the other explanatory variables utilized in this study.

These results fully back the contention of the Bank of Israel that the government often worked at cross-purposes with it, in what the Bank considered a destabilizing manner. The budget was developed in a sort

TABLE 6.17  
FISCAL PROXY  
(1957-1972)

(t) Dependent Variable	Constant Term	(t-2)					Foreign Currency <sup>t</sup>	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Variable
		BOP1	BOP2	BOP3	Growth	Inflation					
Fiscal	241.9	-89.2 (1.6)			4.6 (0.4)	-3.0 (0.1)	-1.2 (0.1)	.26	419.2	.17	.07
Fiscal	-58.8		1.3 (0.2)		5.5 (0.6)	-32.0 (0.5)	0.6 (0.0)	.26	420.8	.16	.10
Fiscal	19.4			3.6 (2.1)	7.8 (1.1)	-8.0 (0.1)	0.9 (0.0)	.27	417.0	.17	.10

Number of observations = 62  
5% F = 4.0

Note: BOP1 = Ratio external reserves/imports  
BOP2 = \$(millions) of import surplus  
BOP3 = BOP2 - unilateral transfers

TABLE 6.18  
FISCAL PROXY  
(1957-1965)

(t) Dependent Variable	Constant Term	(t-2)					Unemploy- ment	t Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Variable
		BOP1	BOP2	BOP3	Growth	Inflation						
Fiscal	111.0	19.0 (0.3)			-0.2 (0.0)	-19.9 (1.0)		2.4 (0.4)	.48	142.3	.26	.22
Fiscal	124.0		0.2 (0.0)		-0.4 (0.0)	-17.4 (0.8)		1.6 (0.2)	.47	143.1	.28	.19
Fiscal	132.9			2.2 (0.9)	-0.3 (0.0)	-18.6 (0.4)		2.2 (0.4)	.49	140.4	.28	.21

Number of observations = 34  
5% F = 4.3

Note: BOP1 = Ratio external reserves/imports  
BOP2 = \$(millions) of import surplus  
BOP3 = BOP2 - unilateral transfers

TABLE 6.19  
FISCAL PROXY  
(1960-1972)

(t) Dependent Variable	Constant Term	(t-2)					Unemploy- ment	<sup>t</sup> Foreign Currency	R <sup>2</sup>	SEE	ΔR <sup>2</sup> Dummies	ΔR <sup>2</sup> Variable
		BOP1	BOP2	BOP3	Growth	Inflation						
Fiscal	434.5	-168.3 (3.3)			6.4 (0.6)	-28.2 (0.4)	11.9 (0.1)	0.1 (0.0)	.34	434.5	.22	.12
Fiscal	-50.0		1.7 (1.4)		6.6 (0.6)	-60.0 (1.2)	-0.2 (0.0)	2.1 (0.1)	.31	443.7	.21	.10
Fiscal	-0.0			4.2 (2.4)	10.3 (1.4)	-26.4 (0.3)	8.0 (0.0)	3.0 (0.2)	.33	438.7	.21	.11

Number of observations = 54  
5% F = 4.1

Note: BOP1 = Ratio external reserves/imports  
BOP2 = \$(millions) of import surplus  
BOP3 = BOP2 - unilateral transfers

TABLE 6.20  
FISCAL PROXY  
(1965-1972)

(t)		(t-2)						<sup>t</sup>			$\Delta R^2$	$\Delta R^2$
Dependent Variable	Constant Term	BOP1	BOP2	BOP3	Growth	Inflation	Unemploy-ment	Foreign Currency	R <sup>2</sup>	SEE	Dummies	Variable
Fiscal	376.8	-213.5 (2.0)			9.4 (0.7)	-1.1 (0.0)	24.2 (0.1)	3.7 (0.2)	.41	535.6	.30	.14
Fiscal	175.7		-0.1 (0.0)		7.9 (0.4)	-22.4 (0.1)	-23.0 (0.1)	6.3 (0.5)	.36	558.0	.30	.06
Fiscal	-125.0			5.1 (2.0)	15.5 (1.5)	-4.1 (0.0)	9.8 (0.0)	6.7 (0.6)	.41	535.2	.30	.11

Number of observations = 34  
5% F = 4.3

Note: BOP1 = Ratio external reserves/imports  
BOP2 = \$(millions) of import surplus  
BOP3 = BOP2 - unilateral transfers

of ad-hoc manner based on the needs and requests of the various agencies (defense, welfare, education, etc. etc.). No serious effort was made to utilize this process as an instrument of economic control. Expenditures and taxes were instead primarily the result of argument, debate, political influence, and general clout. And if expenditures happened to be underestimated (as they often were), that was no problem either. The government would just compel the Bank of Israel to purchase those government obligations that couldn't be readily marketed to the public (thus on occasion forcing the central bank to create money against its better judgement). It is therefore not particularly surprising to find that our regressions confirm that our explanatory variables were not at the top of the list of concern of the politically oriented fiscal authorities.

#### SUMMARY OF REGRESSION RESULTS

We have now completed testing a whole series of dependent variables against the explanatory variables of balance of payments, growth, inflation, and unemployment. The dependent variables ran the gauntlet of those fairly closely under the control of the central bank to those more removed from its direct control. They included minimum reserve requirements, open market operations, monetary growth, credit to the public and to the government, and a fiscal policy proxy. The results showed a strong association between the minimum reserve requirements and the balance of payments and unemployment explanatory variables. For most of the period under study there was also a significant relationship between our growth variable and the minimum reserve variable. Only inflation was not significant at all during this period, which indicates that the authorities were less concerned about moderate rates of inflation than with the

other policy objectives. Growth and low unemployment came first, and the fight against inflation took a back seat. These results are probably a more reliable indicator of the goals of the monetary authorities than those generated with other monetary tools as the dependent variable, since minimum reserve requirements were more directly under their control than the other instruments tested. On the whole then we can conclude that the monetary authorities did manipulate this instrument in a manner consistent with adjusting behavior.

The results of using open market operations as our dependent variable were completely negative, there being no relation between this variable and any of the explanatory variables. The fact that this tool got off to a relatively late start (November 1966), the underdeveloped state of the Israeli securities market, as well as other factors discussed in this chapter (such as the effects and after-effects of the legal interest ceilings) may help to explain these unexpected results.

Monetary growth was not as directly controllable by the central bank as minimum reserve requirements, and the results of the regressions with the rate of growth of the money supply were less positive than in the case of minimum reserves. No relationship of a significant nature was developed between the various balance of payments variables and the rate of growth of the money supply (after accounting for the effect of changes in foreign currency reserves brought about by the change in the balance of payments). However, in various periods examined there was a relationship between the goals of growth and low unemployment, although this was not always the case. Considering all the other influences on monetary growth other than the central bank's policy, it would have been unrealistic to expect more substantial results from this policy instrument.

Neither credit to the public, the government, or the fiscal proxy showed significant results in terms of their relationship with the explanatory variables. One can argue that credit to the public and (especially) credit to the government was far enough removed from direct Bank of Israel control to explain these regression results. But what of fiscal policy? We mentioned how the Bank of Israel complained (with justification as it turns out) that the government was working at cross-purposes to its policy. And we also showed the political nature of the budgetary process in Israel. Nevertheless, it is still hard to accept that there is no underlying rationale behind what appears to be a fiscal policy wholly unrelated to the various policy goals tested. Can we find some rational economic motivation behind the fiscal authorities as we already have in the case of the monetary authorities? (See the discussion on minimum reserves). Was the constant talk by government officials of the importance of a good balance of payments (for example) nothing more than talk? Why were no concrete steps taken to utilize this vital tool as a conscious instrument of balance of payments control? Maybe the answer does lie in the politicization of the Israeli budgetary process, as has been already suggested. There is an alternate hypothesis which might have merit, and this will be taken up in the next chapter.

CHAPTER VII

THE DEFICIT AND UNILATERAL TRANSFERS

One possible explanation for the absence of any statistical relationship between fiscal policy and the balance of payments might be the conviction on the part of the Israeli authorities (despite verbal protestations to the contrary) that the magnitude of the current-account deficit was quite unimportant. Throughout its history Israel has been receiving unilateral transfers (i.e., gifts) from a variety of sources. These included United Jewish Appeal fund raising efforts, United States grants and aid of several kinds, German personal restitution payments (to individuals), German restitution payments to the State, and a whole host of smaller gifts from various countries and individuals. I was curious to see whether there was any statistically meaningful relationship between this year's deficit and next year's unilateral transfers. In other words, maybe the authorities had somehow gotten the idea that a higher deficit will induce higher unilateral transfers. If this were indeed in the case it would be very important indeed, since over the period as a whole unilateral transfers covered roughly 60% of the deficit on current account. Thus these transfers were by no means trivial in the overall Israeli scheme of things.

Logic would dictate that some components of total unilateral transfers would be more responsive to Israel's needs (as measured by the level of last year's deficit) than others. For example, we would expect the funds raised by the United Jewish Appeal to be a function of (among other things) the perceived severity of Israeli balance of payments difficulties. United States Government grants and German reparations would presumably be less sensitive to Israeli's economic plight. Nevertheless, I felt it

would be interesting to test the hypothesis that unilateral transfers taken as a whole were indeed sensitive to the previous years' deficit. To accomplish this, I ran a regression using the level of unilateral transfers (gifts)<sup>1</sup> as the dependent variable, and the deficit on current account as the independent variable.<sup>2</sup> The deficit was lagged one year behind the unilateral transfers, and therefore the deficit ran from 1954-1972, while unilateral transfers from 1955-1973 (for 1973 the first 9 months were extrapolated to an annual basis to avoid the distorting effect of the Yom Kippur War). A war dummy was also incorporated to account for the Sinai Campaign of 1956 and the Six-Day War of 1967. The results were surprising:

TABLE 7.1

Dependent Variable	Constant Term	B	Independent Variable	R <sup>2</sup>	SEE
Gifts <sub>(t)</sub>	= 21.4	+ 0.73	(Deficit) <sub>(t-1)</sub>	.89	89.0
F=(132.5)					

$\Delta R^2$  of dummy = .02

Number of observations = 19

5% F = 4.5

While we would have expected certain components of unilateral transfers to be highly sensitive to Israel's economic situation, the high association between total unilateral transfers and the previous years' deficit came as a bit of a surprise. Is it possible that this association had dawned on the fiscal policy makers and had thus influenced their actions? Might not this help explain the complete absence of a fiscal response to the balance of payments situation? I can't answer that with definity one way or another. But it does make for interesting speculation.

CHAPTER VIII

CONCLUDING REMARKS

During the period under study Israel had a fixed exchange rate, and there were only three formal devaluations (in 1962, 1967, and 1971). Nevertheless, the effective exchange rate (which takes account of import tariffs and export subsidies) continuously declined sufficiently to keep Israeli prices in terms of foreign exchange competitive despite the comparatively high Israeli inflation rate. But devaluation in the absence of effective control of aggregate demand is unlikely to succeed, and we therefore turned our attention to the responsiveness of the various policy instruments to the balance of payments as well as towards other policy goals.

It must be recalled that one of the reasons for selecting Israel for this study was to determine the policy reactions of a young, dynamic, and developing country. Previous work of this nature has been confined primarily to the developed world. The very conditions that made Israel an interesting analytical subject, however, created analytical problems of their own. The discount rate was not used in Israel as an instrument of monetary control. A combination of the underdeveloped state of the Israeli securities market and political in-fighting between the Treasury and the Bank of Israel delayed the start of using open market operations (as a monetary tool) until the end of 1966. And even then, the artificially low legal ceiling on interest rates created distortions and difficulties in operating this policy instrument. Thus for most of the period under study the only monetary tool available to the authorities was the setting of minimum reserve requirements. Even interpreting this normally straightforward tool had its complications as a result of the

liquidity exemptions granted in proportion to the quantity of directed credit. And finally, the very smallness of Israel resulted in massive liquidity changes being induced by balance of payments swings--changes that have the potential of generating misleading results if not properly taken into account. Thus the very youth and smallness of Israel that made it an interesting subject for research, created obstacles in carrying out this type of investigation, obstacles not generally present with the more developed and older countries. Indeed this very smallness of Israel gives us insight into a type of economy not covered in the studies of Michael Michaelley and Jeffrey Sussman. The countries analyzed in those studies were all sufficiently large and developed to preclude an Israeli-type sensitivity to balance of payments changes. In little Israel, however, changes in the balance of payments situation resulted in massive automatic liquidity changes--so much so that all the energy and capacity of monetary policy had to be directed in opposition to these automatic changes. A cursory reading of the data therefore would tend to mislead us into accepting the false hypothesis that the monetary authorities were not following the "rules of the game" whereas in truth they really were. This type of "swamping" effect has not shown up in studies of the major trading countries, but it should be carefully watched for when studying nations whose foreign trade sector is substantial relative to the overall size of the economy. It is highly unlikely to be unique only to Israel.

If we accept changes in the minimum reserve requirements as being most reflective of the desires of the monetary authorities (since it is the policy tool most directly under their control) we find that they were most concerned with the balance of payments, than with growth and unemploy-

ment and only lastly (and only rarely to a significant degree) with inflation. This is consistent with Israel's deeper concern for social goals such as growth and low unemployment (subject to the balance of payments constraint) than for inflation. It is only in the years since the termination of this study in 1973 that concern over the escalating inflationary spiral has begun to move to the forefront of policy concern.

As we get more removed from direct Bank of Israel control the results get weaker. Even so, an examination of monetary growth still gives significant R squares and still shows a significant association with the growth of the economy. An examination of credit to the public and to the government does not yield significant results; but credit to the government was more a function of the Treasury's need for credit than of the desires and wishes of the monetary authorities. Finally, the fiscal policy proxy does not show any association with any of the explanatory variables.

We have tried to explain this lack of fiscal responsiveness on both the Israeli political system and/or the possible Israeli belief that the level of unilateral transfers would rise in step with the deficit. Even if the latter were true, it would still fail to account for the absence of any indication that fiscal policy was utilized to accomplish the various other policy objectives. This does not mean that these results should be discounted or questioned. In a similar study of West Germany undertaken by Jeffrey Sussman,<sup>1</sup> he also came to the conclusion that fiscal policy was not used in a manner consistent with these policy objectives. Of course, there were and are many major differences between the German and Israeli economies, and between German and Israeli goals and objectives. For example, while the goal of very low rates of inflation was at the bottom of the Israeli list of priorities, Sussman has shown it to have been at the

top of the German priority list (possibly due to the traumatic German experience with hyperinflation). Nevertheless, when we take two economies so dissimilar in so many ways and still come up with the same negative fiscal results in both cases, it might be indicative of something more general. Maybe the data is trying to tell us that despite the constant and vocal protestations on the part of various governments as to the seriousness of their desire to accomplish these various policy objectives, they are in reality more concerned with their short-term political interests than with actually taking the sometimes painful steps of pursuing these goals with vigor. Maybe the true citadels of economic orthodoxy actually resides within the walls of the various central banks, whose members tend to be far less politically oriented and far more economically oriented. As long as good economics makes poor politics, and good politics makes poor economics, we probably will continue to find many instances where the data does not support the hypothesis that fiscal policy was used in an adjusting manner with respect to the various policy objectives of the society in question.

FOOTNOTES

Chapter I

1. Michaely, Michael, The Responsiveness of Demand Policies to Balance of Payments: Postwar Patterns, National Bureau of Economic Research, 1971.
2. Michaely, Michael, Foreign Trade Regimes & Economic Development: Israel, National Bureau of Economic Research, 1975.
3. Michaely, Michael, op cit.
4. Michaely, Michael, op cit.
5. Meier, Gerald M., The International Economics of Development, Harper & Row, 1968.
6. The following discussion is based on discussions in Michaely (see footnote #2), and Bank of Israel annual reports, various years.

Chapter II

1. Bank of Israel, Annual Report, 1955-1975.
2. Bank of Israel, Annual Report, various years.
3. Includes Imputed Housing Services.
4. Bank of Israel, Annual Report, 1955-1975.
5. Bank of Israel, Annual Report, 1955-1975.
6. Bank of Israel, Annual Report, 1955-1975.

Chapter III

1. Michaely, Michael, Foreign Trade Regimes & Economic Development: Israel, National Bureau of Economic Research, 1975.
2. Michaely, Michael, op cit.
3. Zanbar, Moshe, and Brunfeld, Shaul, "Thought, Policy and Developments in the Monetary Field, 1948 till 1972" (Hebrew only). Economic Quarterly, September 1973.
4. Zanbar, Moshe, and Brunfeld, Shaul, op cit.

Chapter IV

1. Bank of Israel, Annual Report, various years.
2. Zanbar, Moshe, and Brunfeld, Shaul, "Thought, Policy and Developments in the Monetary Field, 1948 till 1972: (Hebrew only). Economic Quarterly, September 1973.

Chapter IV (continued)

3. Zanbar, Moshe, and Brunfeld, Shaul, op cit.
4. The discussion just concluded is based on the Zanbar and Brunfeld article (op cit) and the Bank of Israel Annual Report.
5. Zanbar, Moshe, and Brunfeld, Shaul, op cit.
6. Zanbar, Moshe, and Brunfeld, Shaul, "Thought, Policy and Developments in the Monetary Field, 1948 till 1972" (Hebrew only). Economic Quarterly, September 1973.
7. Bank of Israel, Annual Report, 1966.

Chapter V

1. A two quarter lag was experimented with and yielded fairly similar results.
2. Michaely, Michael, The Responsiveness of Demand Policies to Balance of Payments: Postwar Patterns, National Bureau of Economic Research, 1971.
3. Michaely, Michael, op cit. page 18.
4. Bank of Israel, Annual Report, 1955-1973 and International Monetary Fund, International Financial Statistics, 1955-1973, both served as major sources of data.
5. Bank of Israel, Annual Report, various years.
6. Bank of Israel, Annual Report, 1957.
7. Michaely, Michael, Foreign Trade Regimes & Economic Development: Israel, National Bureau of Economic Research, 1975, page 147.
8. Michaely, Michael, op cit. page 147.

Chapter VI

1. Based on discussions with Meir Tamari and Shaul Brunfeld, senior economists at the Bank of Israel in Jerusalem.
2. It will be recalled that 1958 was the first year that this tool became devoted to the conscious implementation of monetary policy.
3. Adjusted for serial correlation with Cochrane-Orcutt Iterative Method.
4. Adjusted for serial correlation with Cochrane-Orcutt Iterative Method.
5. Adjusted for serial correlation with Cochrane-Orcutt Iterative Method.
6. Bank of Israel, Annual Report, 1967-1973.

Chapter VI (continued)

7. Zanbar, Moshe, and Brunfeld, Shaul, "Thought, Policy, and Developments in the Monetary Field, 1948 till 1972" (Hebrew only). Economic Quarterly, September 1973, page 28.
8. The data required in the development of the fiscal policy proxy was obtained as follows: The change in Israel's internal debt is to be found on a quarterly basis in the Bank of Israel Annual Report, 1956-1973. Changes in foreign exchange holdings and the deficit on current account are available on a quarterly basis from the I.M.F. International Financial Statistics. The latter source also shows changes in external debt on a quarterly basis after the third quarter of 1971. Prior to that quarter only annual data is available, and the quarterly data was estimated as simply  $\frac{1}{4}$  the annual figure.

Chapter VII

1. Bank of Israel, Annual Report, 1955-1973.
2. I.M.F., International Financial Statistics, 1954-1972.

Chapter VIII

1. Sussman, Jeffrey, "An Empirical Analysis of the Policy Response to the Balance of Payments in West Germany", Ph.D. Dissertation, 1974.

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