Price-Level-Adjusted Mortgages in Israel

Alex Cukierman*

I. INTRODUCTION

The high rates of inflation that characterized the Israeli economy during the early fifties brought the flow of financial savings to an almost complete standstill. In an attempt to re-open this channel of funds, the government and private investors started offering financial obligations that were denominated in some constant purchasing power unit.[1] The outstanding principal and the remaining interest payments were adjusted periodically in line with a price level index. The most commonly used indices were the consumer price index (C.P.I.) and the price of the U.S. dollar in terms of the Israeli pound. By the mid-fifties, almost all of the long-term capital raised through bonds by the government or financial intermediaries was linked to the dollar, the C.P.I., or some combination of the two. As a result, users of funds were required to repay their loans with similar linkage stipulations. The same was true in the housing mortgage market. Virtually all new mortgages from the mid-fifties were linked to one or both indices.

II. DESCRIPTION OF MORTGAGE INSTRUMENTS

Since price-level-indexation arrangements varied over time in response to changes in political and economic forces, we start this review with a short historical description of the developments in this area, in order to provide a clearer perspective.

*Lecturer in Economics, Tel-Aviv University. The author would like to thank, without implicating, Jacob Bach, Ernest Lehman, Moshe Kahn, and Ezra Blass from the General Mortgage Bank, Jacob Aldoby, Giora Gazit, Abraham Lifshitz and Nachman Meyudovnik from the Treasury, Shmuel Allon from "Tfahot," Ephraim Kleiman from the Hebrew University and Victor Medina from the Bank of Israel Research Department.

[1]This tendency was probably encouraged by an old Ottoman law which put a legal ceiling on the interest rate, thus preventing the nominal rate of interest from adjusting to the rate of inflation.

A. *Introduction of Alternative Mortgage Instruments and Historical Review*

Price-level-indexed mortgages appeared around 1956; they prevailed until 1967-70, when they were gradually discontinued owing to a series of governmental decisions.[2] The February 1962 devaluation of the Israeli pound (IL.)[3] was a turning point in the history of mortgage indexation. Until that devaluation, the borrower could choose (at the time he got the mortgage) between linkage to the C.P.I. and linkage to the U.S. dollar. Since the C.P.I. increased monthly and devaluations of the pound occurred infrequently, linkage to the dollar did not involve frequent adjustments in the mortgage payment — but did involve the risk of a big adjustment when the rate of exchange did change.

Up to 1962, most borrowers chose linkage to the dollar; only a minority chose linkage to the C.P.I.[4] At the February 1962 devaluation, borrowers with dollar-linked mortgages saw the value of their obligations increase by 66 percent overnight. This unleashed an outcry which brought about a revision in the terms of both existing and new mortgages. Basically all post-devaluation new mortgages became linked to the C.P.I., and homeowners with existing dollar-linked mortgages could, under certain conditions, convert the dollar linkage to indexation to the C.P.I. These changes were introduced by governmental decision, and the government covered the resulting losses to the mortgage banks.

Most borrowers with dollar-linked mortgages chose to convert to C.P.I. linkage so that by 1963 most mortgages were index-linked. By 1964, however, political pressures from various beneficiaries of government or government-subsidized long-term loans resulted in the gradual replacement of linkage, by a fixed premium on agricultural and industrial loans. At first, the mortgage market was unaffected by these tendencies. The C.P.I. indexation prevailed — but the lag between increases in the C.P.I. and in actual linkage payments grew longer, decreasing the effective linkage rate below 100 percent.

In 1965, a governmental commission (the Sherman Commission) recommended using the cost of living allowance (C.O.L.A.) instead of the C.P.I. as the reference index for mortgage linkage, on the ground that it yielded better synchronization between increases in wages and increases in

[2]But mortgage banks continued to raise capital by issuing bonds linked to the C.P.I. We shall return to this point in the section on "Experience."

[3]From IL.1.80 to the dollar to IL.3.00 to the dollar.

[4]This was due mainly to the preference of bond buyers who supplied the mortgage funds for the dollar linkage. In order not to take unnecessary risks, the mortgage banks pushed the dollar-linked mortgage harder, even though the borrower could choose the type of indexation. Their success is probably explained by the lack of financial sophistication of the population at that time, and its strong preference for delaying linkage payments into the future. Whenever the borrower did not specify his preference (and this was common), the bank chose the dollar-linkage for him in order to "save" him immediate linkage payments.

mortgage payments.[5] During 1966 and part of 1967, new mortgages were usually linked to the C.O.L.A. In 1967, a government decree replaced the linkage clauses with a 3-4 percent annual premium on most new government-regulated mortgages. During 1968 and 1969, this arrangement was extended to existing mortgages as well, and all new mortgages (including those from private sources) switched to this arrangement. Borrowers with existing mortgages gradually converted their linked mortgages to the new unlinked ones; by the beginning of the seventies, the outstanding stock of linked mortgages was reduced to a relatively small balance that is still shrinking. However, mortgage banks continued to raise capital with index-linked bonds. The risk that their obligations would increase faster than their assets was assumed by the government, which took upon itself the obligation to cover the cost of linked borrowing, provided that the mortgage banks observed some constraints pertaining to the size of the mortgages which they granted from these funds.

With the increase in the rate of inflation well above 3-4 percent in the beginning of the seventies, the demand for unlinked mortgages soared. However, the supply of government-regulated mortgages did not respond to the demand, owing to the Treasury's power to abstain from insuring mortgage banks if they did not follow governmental instructions.

Linked mortgages are still available today, but, in view of the present high rate of inflation and the availability (though in limited amounts) of unlinked mortgages, hardly any new linked mortgages are being asked for.

In all cases, the initiator of the changes in mortgage conditions was the government, which responded to various public pressures. Whenever the changes involved taking some of the load from the holders of existing mortgages, the government assumed all resulting losses to the mortgage banks.

B. *Price-Level-Adjusted Mortgages — Main Features*

At the time the mortgage is granted, the interest and principal payments are usually spread over the life of the mortgage so as to yield equal payments before indexation. Actual payments are determined by increasing the fixed repayment by the rate of increase in the reference index (usually the C.P.I.) from the base period to each repayment period.

There are substantial differences between mortgages from private and governmental sources with respect to maturity, contractual rate, lags in the adjustment mechanism and length of time between payments. The terms of government-subsidized mortgages are determined mostly by the degree of subsidization that the government wants to grant the mortgagor. Therefore, the following discussion distinguishes between private and government mortgages.

[5] Virtually all wage contracts in Israel are linked to the C.P.I., but actual cost-of-living allowances are paid just once or twice annually only if the C.P.I. increased 5 percent since the last increase in the C.O.L.A. As a result there are short-run differences between the two indices.

Mortgages from Private Sources. The *contractual rate* is usually 8 percent, which, for at least part of the period, is also the maximum rate allowed legally. The linkage applies to both principal and interest. The mortgage is usually for a period of 10 to (at most) 15 years.

Prior to the 1962 devaluation, payments were adjusted monthly according to the increase in the C.P.I. from the base period to the current one.[6] After the 1962 devaluation, payments were set six months at a time to the increase in the C.P.I. over the preceding six months (including adjustments for indexation which should have taken place during the six-month period) and broken into six equal monthly payments. After the mid-sixties, the lags in indexation charges grew longer as part of the gradual abolition of indexation.

Mortgages from Governmental Sources. Since the government uses the term of mortgages as a policy instrument to achieve varying degrees of subsidization, there is a wide variation in the terms of those mortgages. The *contractual rate* varies between 3 and 8 percent. *Maturity* is usually longer than in private loans, and varies between 15 and 30 years. In some cases, only a certain percentage of the loan is linked.

For government mortgages the lag in *adjustment* to the C.P.I. was larger than in private loans and in many cases the adjustment was made only if the C.P.I. had increased a specified percentage, usually 5 percent, since the last adjustment.

C. *Tax Treatment*

Landlords are allowed to charge interest and linkage charges on interest as expenses for tax purposes.

According to the Income Tax Ordinance until the end of the sixties, a homeowner who lived in his own home had to impute to his income for tax purposes the value of the services he got from the home. Against this income, he was allowed to charge expenses of interest and *linkage charges on interest* from any mortgage used to finance the house. In practice, most such homeowners did not impute the value of the housing services and did not claim the interest expenses.

D. *Mixed Government-Private Funding of Loans*

In many cases, the mortgagor eligible for government help got a loan financed by some composite of government and mortgage bank funds. The loan was administered by the mortgage banks. However, by agreement between the government and the mortgage banks, the mortgagor repaid the bank first — usually within a ten-year period — and only then started paying the government loan. Since both the contractual rate and

[6]This procedure had the psychological effect of surprising people unpleasantly each time they went to pay.

the percentage linkage of the portion from the mortgage bank's funds were higher than in the portion financed by government money, the mortgagor usually had a larger monthly payment (before linkage) during the first ten years.[7]

III. INSTITUTIONAL STRUCTURE OF THE SYSTEM FOR FINANCING OF HOUSING

A. *Position of Mortgage Lenders*

Over 95 percent of all mortgage loans in Israel are made by mortgage banks. The rest is insignificant, and comes mostly from insurance companies and private builders.

Most mortgage banks are public corporations whose shares are held by commercial banks, the government and the general public. The mortgage industry is highly concentrated; the four largest mortgage banks hold over 85 percent of the combined assets of the mortgage banks. The government has a controlling interest in the largest mortgage bank. Each of the other three large mortgage banks is affiliated with one of the three largest commercial banks which dominate the commercial banking business.

Table 1 summarizes the *relative position of mortgage banks* in the Israeli financial structure in terms of their share in the total assets of the financial system. During the fifties, their share hovered *around* 4 percent; at the beginning of the sixties, it climbed swiftly to around 12 percent, and stabilized there throughout the sixties. Since the beginning of the seventies, their share has been declining as a result of government restrictions designed to dampen the boom in the construction industry.

Relation of mortgage lenders to others. Long-term savings from the private sector are channelled mainly into provident funds (social insurance funds), insurance companies, and Treasury bonds for the government's development budget. These funds are then re-channelled (either directly or through the purchase of bonds) to development banks which specialize in long-term financing of various sectors of the economy such as agriculture, industry, tourism or construction and to mortgage banks which specialize in providing credit for housing short-term funds flow through the banking system.

B. *Assets and Liabilities of Mortgage Banks*

The assets and liabilities of mortgage banks are summarized in Table 2. The bulk of the assets is accounted for by loans against mortgages, plus deposits with the Accountant General at the Treasury. This last item requires some clarification: The Israeli Government uses the mortgage

[7]Government loans in these cases usually had amortization periods of between 20 and 30 years.

TABLE 1

THE SHARE OF FINANCIAL INTERMEDIARIES IN THE ASSETS OF THE FINANCIAL SYSTEM (PERCENTAGES)

Year	Commercial Banking Institutions	Mortgage Banks	Industrial Development Banks	Agricultural Development Banks	Development Banks (Other than Industrial Agricultural)	Investment Companies	Companies Lending to Households	Mutual Funds	Provident Funds	Insurance Companies	Total (Percentages)	Total Financial Assets in Millions of IL.
1962	57.0	8.7	9.2	4.5	2.1	2.4	0.6	0.2	13.0	2.3	100.0	6,550.5
1964	51.5	11.7	7.9	3.9	4.6	2.8	0.5	0.5	14.0	2.6	100.0	10,162.2
1966	50.0	13.2	6.7	3.6	4.0	3.9	0.5	0.3	15.0	2.8	100.0	14,105.1
1968	53.1	13.1	5.8	4.0	3.0	3.4	0.4	0.3	14.0	2.9	100.0	19,551.5
1970	56.7	9.2	4.9	3.3	2.5	3.8	0.3	0.8	15.1	3.4	100.0	26,301.1
1972	62.9	7.8	4.7	2.9	2.3	2.5	0.3	1.0	12.4	3.2	100.0	46,361.6

Source: Bank of Israel; Annual Reports Various Years (1) and Ben-Shahar, Bronfeld & Cukierman (4)

TABLE 2

ASSETS AND LIABILITIES OF MORTGAGE BANKS (PERCENTAGES)

	1958	1960	1962	1964	1966	1968	1969	1971	1973
Liabilities									
Governmental deposits ear-marked for loans	72.6	67.2	45.3	44.6	36.4	33.8	34.8	34.3	29.8
Bonds	5.1	9.8	33.4	26.9	28.0	32.6	32.1	36.5	35.4
Other deposits ear-marked for loans	12.2	14.0	11.2	14.0	20.9	21.9	20.9	15.3	18.1
Own capital	3.0	4.3	7.7	8.5	5.7	5.0	4.9	4.7	4.3
Other liabilities	7.1	4.7	2.4	6.0	9.0	6.7	7.3	9.2	12.4
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Assets									
Loans	92.4	93.9	75.9	83.4	77.8	71.8	71.3	73.4	70.4
Deposits at the Accountant General	4.6	3.4	21.2	13.8	18.1	23.5	24.6	24.9	28.3
Other Assets	3.0	2.7	2.9	2.8	4.1	4.7	4.1	1.7	1.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (Millions of IL.)	109	227	550	1,073	1,901	2,567	2,951	3,810	6,552

Sources: 1958-1964 Barnea (2); 1966 and on: Bank of Israel, Research Department.

banks (as well as the other intermediaries that allocate funds to the real sector) as channels for some of the government bonds issued to the public. According to this arrangement, the mortgage bank issues bonds bearing its name and deposits the proceeds with the Accountant General, who guarantees the bank the same terms that the bank offered to the bond buyers, plus a commission.

On the liabilities side, the major item is government deposits earmarked for loans. Through these deposits, the government supplies the mortgage banks with funds for various groups that the government wants to subsidize. Naturally, the terms of these mortgages are determined by the government (and not necessarily in line with the price that the government pays to secure the funds for these mortgages). The other deposits earmarked for loans are similar: they are mostly deposits by various builders and contractors earmarked for mortgages to their customers. In both cases, the mortgage banks handle the paperwork but do not determine either the terms or the allocation of the funds; these decisions are made by the depositors.

The mortgage banks do have some discretion with respect to the funds that come from the issuance of long-term bonds which are not for the Accountant General, and from ownership capital. However, even here there is a certain degree of government intervention that will be discussed at some length in the next section.

There is little *asset diversification* by the mortgage banks. This is due to the high proportion of asset composition that is determined by depositors, particularly the government, and to the fact that the major risks which face the banks are either eliminated or assumed by the government.

The two major risks are:

1. default by the borrower.
2. losses as a result of different rates of return on assets and liabilities.

The first risk is minimal — because the mortgage banks lend a maximum of 40 percent of the value of the mortgaged asset, and only against a first mortgage. Since 1967-69, the second risk has become rather serious, at least in principle, because the mortgage banks borrow through linked bonds and lend with no linkage clauses.

After the abolition of linkage on mortgages, with no similar abolition on long-term bonds issued by the mortgage banks, the government assumed the responsibility of paying the linkage charges to the banks — in exchange for a 3-4 percent premium from the banks, provided that the banks observed certain restrictions on the use of these funds. Hence, the second risk has also been shifted away from the mortgage banks.

C. *Forms of Government Intervention in Mortgage Markets*

Housing construction in Israel is a leading industry. Its activity closely impinges on issues of social policy and on the goal of population dispersion. Being a country of large and erratic immigration, Israel often

found itself with the need to provide dwellings quickly for waves of immigrants. This put a severe strain on the private construction industry. To alleviate this strain, the government formed several large government-owned construction companies soon after the establishment of the State in 1948. Their major task was to build for newcomers, but they gradually expanded into building for all segments of the population.

Hence, the government intervenes in both the real side of building and its financing. However, a substantial portion of construction, particularly the more expensive, is handled by the private sector. The relative importance of government versus private construction can be appraised from the tables on housing in the statistical record.

Direct and Indirect Government Financing of Mortgages. The government intervenes in the mortgage market directly by owning a majority interest in the largest mortgage bank, which executes, to a large extent, government policy on mortgage terms and allocation. The government also deposits its funds with large private mortgage banks, and instructs them to follow the government's policy directions on terms and allocation.[8]

The government also determines, to a substantial degree, the terms and allocation of mortgages from the mortgage banks' own capital by making *ad hoc* financial package deals with the banks. In such deals, the Treasury would deposit a substantial amount of money with a particular mortgage bank earmarked for loans (on which the bank would make a commission) on the condition that the bank allocate a specified proportion of its own funds for the same purpose. The bank would charge its customers more on loans from its own capital, but the allocation would be made according to the government's guidelines.

In addition to these interventions, on several occasions the government has changed the terms of both new and existing mortgages from the banks' own sources. Striking examples of such interventions are the replacement of dollar-linked mortgages by C.P.I.-linked mortgages, and the gradual replacement of linkage by a higher interest rate. In both cases, the government ultimately had to assume the position of the borrower with respect to the mortgage banks; the latter had to be covered, since their obligations remained linked to the dollar in the first case and to the C.P.I. in the second. The mortgage banks passed on to the government all the payments from the borrowers who opted for index linkage in the first case, and for a higher fixed interest rate in the second. The government, for its part, paid the mortgage banks according to the original linkage terms of the loans; this amounted to a subsidy to most of the previously linked mortgagors.

[8]These funds originate in the government's development budget, which is financed mostly by long-term bonds issued by financial institutions.

Since 1967-68, all new mortgages from both government and private sources have been unlinked. However, the mortgage banks continue to mobilize most of their own capital by issuing C.P.I.-linked bonds. In order to cover the banks, the government offered them reimbursement of their linkage payments if they observed certain restrictions in the use of the funds and paid the Accountant General a 3-4 percent premium. This premium was raised, with a very long lag, as the rate of inflation accelerated in the early seventies and attained 8 percent at the margin recently.

In some instances, the Accountant General makes short-term advances to the banks, and also pays them the bond rate linked interest plus commission for any short-term funds they care to deposit with him. Hence, the *Accountant General performs some (but not all) of the functions of the Federal Home Loan system* in the United States.

Government Intervention in the Markets for Long-Term Bonds and Savings Deposits. The largest portion of mortgage banks' funds is mobilized through long-term bonds usually maturing in 10 to 17 years. The government intervenes in this market in several ways. First, it sells its own bonds and deposits part of the proceeds, earmarked for loans, with the mortgage banks. Second, it grants tax benefits and a government guarantee to some long-term bonds issued by the mortgage banks.

Hence the *government assumes part of the role of the FSLIC*[9] in the United States by insuring some of the mortgage lenders' obligations; however, the bulk of these obligations are long-term linked bonds rather than savings deposits. Most savings deposits in Israel are administered by commercial banks which have to invest them in long-term government bonds or in "approved" long-term bonds issued by various financial institutions (including mortgage banks). By giving or denying its approval to particular issues, the government can increase or decrease the market facing particular financial intermediaries. Usually, the bonds of the larger mortgage banks are "approved."

Tax Benefits. The government grants tax benefits at various stages of the saving process. First, all receipts from principal adjustments on long-term bonds and savings deposits are tax free.[10] Savings deposit interest, and linkage payments on interest, are also tax free. Most long-term bonds issued by mortgage banks are exempted from tax on interest and linkage, or carry a maximum tax of 25 percent.[11]

[9]As a result of the recent default of the British-Israeli Bank, a bill proposing the establishment of a Deposit Insurance Corporation to insure all deposits of up to IL.25,000 is being considered by the Israeli Parliament.

[10]However, linkage payments received by mortgage banks and other financial intermediaries are considered to be regular taxable income.

[11]This is a substantial benefit in a country in which the tax structure climbs rather quickly to a marginal tax rate of 70 percent.

Until the early seventies, homeowners, occupying their home could deduct interest charges plus linkage on interest, but only against the imputed income originating in home ownership. Such deductions are still allowed to landlords.

Interest Subsidies. The government grants various interest subsidies to mortgagors. These subsidies have taken the form of a low direct interest rate, a larger amortization period, a proportion of indexation lower than 100 percent, lags in the payments of indexation charges, and retroactive cancellation of dollar linkage and C.P.I. indexation charges.

After 1962, the forms of subsidization changed. For example, in mortgages for new immigrants, linkage charges were forgiven if the loans were paid off during the first five or ten years. During this period no interest or amortization payments were due. If the loan was repaid during this period, the accumulated interest payments were due from the borrower; if it was not paid off, the accumulated interest plus 35 percent of the linkage charges due for the initial period was added to the principal and from that time on, this total was fully linked.

After the cancellation of linkage, subsidies usually took the form of a low nominal interest rate and a long amortization period.

IV. EXPERIENCE

Part II, Section A gave a historical overview of the introduction of changes in and elimination of mortgage indexation. The focus here is mainly on the benefits and problems of the various mortgage instruments, and on major political interventions that brought about changes in the instruments.

A. *Major Political Intervention and Changes in the Terms of Existing Mortgages*

The introduction of linked mortgages in the mid-fifties was motivated by economic forces and backed by the government, which appointed a special committee that recommended linking a wide array of financial assets and liabilities — including the assets and liabilities of the mortgage banks.[12] The 1962 devaluation, which found most mortgages linked to the U.S. dollar, unleashed an outcry that soon pressured the government into providing some form of relief.

The experience of the public with dollar-linkage, as well as the total abolition of linkage on loans to various other sectors of the economy, raised the question of abolition of linkage on mortgages as well. Following some of the recommendations of the Sherman Commission appointed in 1965 to investigate this problem, the government started by

[12]See "Report of the Lehman Committee," 1955 and 1959.

freeing some of the most recently granted mortgages from indexation. However, once this precedent had been set, most existing indexed mortgages were given similar options — and most were substituted for unlinked mortgages with a higher *fixed* rate of interest. In all cases, the resulting risks were shifted to the taxpayer.[13]

B. *Lessons and Proposals for the Future*

Several lessons may be drawn from this experience. First, one of the major elements that unleashed popular resistance to mortgage indexation was the *lack of synchronization* between increases in salaries and increases in mortgage payments. This was particularly striking after the 1962 devaluation, when both the principal balance and the periodic payment increased overnight by 66 percent with no matching increase in wages. This moved the Sherman Commission to recommend that mortgage payments be increased only when a C.O.L.A. is actually paid, since there is a divergence between increases in the C.O.L.A. and increases in the C.P.I.

The lack of synchronization between wage increases and indexation increases in mortgages seems to have been at the root of the wide resistance to mortgage indexation which eventually caused its abolition. It follows that indexation may have been more durable and bearable if the reference index used had been some index of *wages* rather than an index of *prices.*

C. *Other Benefits and Problems of Indexation*

Benefits. The main benefit that indexation of the assets and liabilities of financial intermediaries brought about was the renewal of the flow of financial savings to construction and other industries. This was particularly striking in the early fifties, when the rate of inflation reached 60 percent per year. Before indexation, the flow of financial savings and the new-issues market dried up completely; with the introduction of indexation of long-term bonds, the new-issues market reopened — and ever since has been a substantial source of funds for mortgages.

A related benefit of price-level indexation is that it reduced the volatility of savings inflows to mortgage banks and other financial institutions. Although mortgage bank assets and liabilities are quite closely matched — long-term mortgages backed by mortgage bonds — they do attract some funds in the form of savings deposits. Since these deposits are indexed, however, whenever there is an increase in the rate of inflation, savers get compensated by the linkage clause. Hence, the flow of funds to such savings deposits increases when nominal interest rates lag

[13]At the time the substitution was made (1966/7), inflation was slight so the increased interest more than compensated the government for waiving the linkage. However, the situation has been reversed since 1970.

behind the acceleration in inflation.[14] This is further reinforced by special savings plans. An example is the "Savings for Housing Plan," which was established by the government in 1955. It is linked to the cost of construction index, yields a rate of interest between 4-6 percent (the longer the saving period, the higher the rate of interest), and is tax free if used as a down payment or if it is not withdrawn for three years. In addition to his accumulated savings, the saver is eligible, after several years, for a C.P.I.-linked mortgage whose size increases monotonically with the size of the original savings.

Savings deposits are for shorter-time periods than are mortgages, and may not be withdrawn before the end of the specified saving period. In practice, however, they are repaid on demand — but with a substantial loss of benefits to the saver. As a result, existing savings are not very volatile.

Problems. Some of the problems associated with linked mortgages arose as a result of the borrowers' misunderstanding of the nature of their obligations. This was due to a lack of financial sophistication on their side, as well as to slow and unsuitable administrative practices by the mortgage banks, particularly in the early years of indexation.

For example, mortgage banks sent invoices for unadjusted payments, and would adjust the payments for accumulated linkage charges only when the mortgagor came in to pay. This created repeated frustration on the part of borrowers. Later, this problem was eased by the increasing computerization of the mortgage industry.

Another problem was created by premature mortgage repayments. Owing to the fact that the initial payments had a large interest component, coupled with a rate of inflation that customarily ranged during the sixties between 6 percent and 12 percent, mortgage recipients who wanted to repay their mortgage prematurely found that after making payments for several years they still owed more (in nominal terms) than they had initially received. This led some mortgagors to believe that they would never be able to amortize their mortgages.

Since at least some of those psychological effects are based on misconceptions, they can easily be remedied by suitable information on linked mortgages *before* this liability is assumed by the individual.[15] More importantly, in my view, the home buyer should be able to choose between an unlinked mortgage at a high interest rate and an indexed one at a lower interest rate. If this alternative had existed in Israel when indexed mortgages were offered, many people would have blamed themselves rather than the government when the time to pay indexation charges arrived.

[14] Institutional forces prevent nominal interest rates from adjusting fully to the rate of inflation.

[15] Some proposals to deal with those psychological effects are discussed in A. L. Gaathon, *Economic Productivity in Israel*, New York: Praeger, 1971.

D. *Particular Problems Associated with the Abolition of Mortgage Linkage*

The abolition of indexation on mortgages, without similar abolition on the liabilities side of the mortgage banks' balance sheet, was made possible by the government, which assumed all the resulting risks. This increased the government's already substantial involvement in the capital market, and decreased the mortgage banks' range of free action.

It may be argued that since the government, as a financial intermediary, borrows with linkage clauses and lends without them, it has an additional incentive to prevent inflation. This is probably true for mild inflation as in 1968-70. However, the acceleration of inflation during the early seventies seems to demonstrate that this element is too weak to overcome stronger forces working for inflation.

In the transition period from indexed to non-indexed mortgages, there was a retardation in the demand for mortgages due to the feeling that "favorable changes" for mortgagors were about to be enacted. As a result, when indexation was abolished, the demand for mortgages increased — helping to terminate the 1966-67 slump in the construction industry. It is interesting that most of the mortgagors who were given the option of replacing the linkage with a 3-4 percent increase in the interest rate chose to do so, even though actual prices had hardly increased at that time. This phenomenon indicates that the public expected the long-run rate of inflation to be higher than the abnormally low rates of inflation during 1966-68, and in particular that it would be higher than the 3-4 percent premium.[16]

E. *Experience with Other Index-Linked Financial Contracts*

Until the mid-sixties, most long-term financial contracts were linked to the C.P.I. These included long-term bonds, savings deposits, life insurance, pensions, provident funds, wages (through the almost universal C.O.L.A.), and term loans from the government and financial intermediaries to various industries. During the second half of the sixties, the linkage clause on most loans to industries was replaced by a fixed increase of 2-4 percent in the interest rate. However, all other financial contracts (mostly between savers on one side and financial intermediaries and the government on the other) remain linked to the C.P.I. until the present time. All the risks created by this divergence between the borrowing terms of financial intermediaries and the government on one hand, and their lending terms on the other, were either directly or indirectly assumed by the government.

[16]Robinson, p. 179, who attributes this view to the Bank of Israel, explains this by claiming that the public "preferred the certainty of fixed principal and interest payments over the uncertainty and risk involved in linked loans." Note that this explanation attributes money illusion to the public.

During the early days of statehood, there were attempts by the Treasury to manipulate the C.P.I. in order to prevent general increases in wages through the C.O.L.A. Later, such direct attempts stopped. However, the government usually gave large subsidies to some of the goods which weighed heavily in the index, in order to increase the lag between the C.O.L.A. and the C.P.I.

The experience with linked bonds and savings deposits has been, on the whole, quite favorable. With a relatively high and volatile rate of inflation, the linked bond market provided a steady avenue of funds for long-term investments, and protected the small saver against inflation. It is quite probable that its existence decreased inflationary hoarding of real goods, thus helping to decrease the rate of inflation. After the Yom Kippur War, for example, when the rate of inflation jumped from 20-25 percent to almost 50 percent on an annual basis, the demand for new issues of linked bonds almost quadrupled. With no such financial instrument, constant in real terms, this demand would have been directed at the goods' market.

As a result of the abolition of linkage on loans, taxpayers subsidize the loan recipients whenever the rate of inflation increases above a certain level and the size of the real subsidy increases with the increase in the rate of inflation.

V. SUMMARY AND CONCLUSION

The indexation of mortgages in Israel began in the mid-fifties as part of a general adoption of indexation in broad segments of the capital market as well as of the labor market. The drying up of funds for home building caused by a combination of high inflation and legal ceilings on rates of interest hastened the adoption of indexation by mortgage banks. The mortgage banks issued price-level or dollar-adjusted bonds and to match these obligations, mortgages with matching adjustments. This move renewed the flow of funds to home building. Until the 66 percent devaluation that occurred in February 1962 most mortgages were exchange-rate adjusted. From then and until the final abolition of mortgage indexation in 1968 most mortgages were price-level adjusted and the reference index was the C.P.I.

Mortgages were usually granted for a period of around ten years with an escalated rate of interest of up to 8 percent. Price level adjustments were usually made with a lag. Since there was an almost perfect matching of assets and liabilities of the mortgage lenders both in terms of maturity and reference index, no "locked-in effect" (akin to the one found in the American mortgage industry) arose in the Israeli mortgage industry.

Government intervention in both the building and the mortgage industry was and still is substantial. Government corporations carry out a substantial amount of the building activity. Through the mortgage banks, the government granted subsidies to particular classes of mortgagors in

the form of lower interest rates, partial or no escalation of the mortgage and longer maturities. During the transition from dollar to C.P.I.-adjusted mortgages and later from those mortgages to regular mortgages with a higher interest rate, the government assumed the responsibility for the differences that this move created between the assets and liabilities of the mortgage banks, on new as well as on most seasoned mortgages.

Since 1968 price-level adjustments no longer exist in most long-term loans to housing, industry, agriculture and various other industries. However, financial institutions and the government continue to raise funds with C.P.I.-adjusted bonds. The resulting differences are covered by the government. Thus the taxpayers subsidize the recipients of loans. Moreover, since the rates paid by the borrowers are very sluggish, the size of the real subsidy becomes a function of the rate of inflation.

It would seem to the superficial observer that the ultimate abandonment of mortgage indexation in Israel suggests the failure of this mortgage instrument. I would be inclined to take a less pessimistic view. The introduction of indexation on bonds and savings deposits was certainly very beneficial since it assured a steady flow of savings to finance mortgage loans and eliminated the adverse dependence of those flows on the rate of inflation. Most of the problems that indexation brought were on the side of borrowers. However, in my view they were created mainly because of a shortsighted implementation of mortgage indexation. The choice of the price of the dollars in terms of local currency as a reference index for mortgage adjustments created very serious problems of synchronization between the wages of the mortgagors and the monthly mortgage payment once a devaluation actually occurred. The size of the 1962 devaluation made this problem even more acute and put many borrowers in a difficult situation. As a result the government had to intervene and provide relief by assuming some of the mortgagors' obligations. But once such a precedent has been established, demands for abolition of price-level-adjusted mortgages multiplied even though the synchronization problems of those mortgages were far less serious. In my view the lessons to be learned from this experience are not that mortgage indexation does not work but rather that certain rules should be observed in its implementation: Firstly, the choice of reference index should assure a substantial degree of synchronization between the mortgage payment and the wage of the mortgagor. Possibly an index of wages or several wage indices, according to the borrower's profession, should be used. Secondly, the borrower should be given the choice between a regular mortgage at a high interest rate and an indexed mortgage at a lower rate. Finally, the risks involved in the choice of each mortgage type should be clear to the borrower *before* he decides which type of mortgage he will take.

REFERENCES

Bank of Israel — *Annual Reports* — Various years.

Barnea, M. "The Financial Structure of Israel's Mortgage Banks, 1958-1964." *Bank of Israel Bulletin,* 24 (December 1965):54-79.

Ben-Shahar, H. *Interest Rates and the Cost of Capital in Israel, 1950-1962*. Basel: Kyklos-Verlag, 1965.

Ben-Shahar, H., Bronfeld, S., and Cukierman, A. *The Capital Market in Israel.* Jerusalem: Weidenfeld and Nicolson, 1971.

Ben-Shahar, H., and Cukierman, A. "The Yield to Maturity on Bonds and Expectations of a Devaluation and Price Increase, 1958-67." *Bank of Israel Bulletin,* 32 (January 1970).

Central Bureau of Statistics. *Monthly Bulletin of Statistics.* Various issues.

________________. *Monthly Price Statistics.* Various issues.

________________. *Statistical Abstracts of Israel.* Various issues.

Dan Amiel, Vallery. "Effective Rates of Exchange in Israel's Foreign Trade 1962-70." *Bank of Israel Economic Review,* 39.

Dovrat, Ephraim. "Linking of Mortgages in Israel." *Banking Review* (March 1966):31-45 (Hebrew).

Gaathon, A. L. *Economic Productivity in Israel.* New York: Praeger, 1971. Published in cooperation with the Bank of Israel.

General Mortgage Bank. *Annual Reports* (Hebrew).

Israel Financial Research Institute. "Terms of Mortgage Linkage — Analysis of Alternative Proposals" (Hebrew).

Menzli, Y. "The Structure and Development of Interest Rates in the Israeli Economy 1955-1969." Bank of Israel. Unpublished. (Hebrew)

Morag, A. "For an Inflation-Proof Economy." *American Economic Review,* 52 (March 1962):177-85.

Robinson, H. "Readjustable Mortgages in an Inflationary Economy — A Study of the Israeli Experience." *Journal of International Law and Economics,* 5 (January 1971):169-184.

Rubner, A. "The Abdication of the Israeli Pound as a Standard of Measurement for Medium and Long-Term Contracts." *Review of Economic Studies,* 28 (1960/61):69-75.

Treasury Department. *Report of the Lehman Committee,* 1955. (Hebrew)

———————. *Report of the Lehman Committee,* 1959. (Hebrew)

———————. *Report of the Public Committee on the Problem of Index Mortgages*. Sherman Committee. (Hebrew)