ACCESS TO HOUSING FINANCE AND ALTERNATIVE FORMS OF HOUSING LOANS IN THE 1980's

by

Judith Yates

No. 68 July 1983

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In the past decade, Australia has been faced with persistently high and variable rates of inflation. Expectations that this state will continue have led to the incorporation of an "inflation premium" in nominal interest rates in order to compensate lenders for the anticipated erosion of the real values of their capital. This resultant upward pressure in nominal interest rate may also have been compounded by a tax system which treats this inflation premium as income. Although there is no inherent reason why increased nominal rates of interest resulting from increased inflation should worsen a household's real financial position or increase the real cost of its housing, the mortgage instrument conventionally used in Australia does, in fact, unnecessarily exclude certain types of borrowers from access to housing finance and hence from owner-occupation. With a variable rate credit foncier mortgage instrument, repayments are fixed in nominal terms for the life of the loan and change only when the interest rate charged on such mortgages changes. Use of this instrument in times of inflation therefore increases the real burden of debt service (as measured by the repayment to income ratio for a given loan) in the early years of such a loan. This results from the fact that while nominal interest rates have risen in response to anticipated future inflation, it is only in the future that incomes will rise to match the resultant increase in current repayments on a given loan.

The impact on the repayment burden of the increase in the underlying persistent rate of inflation of approximately 2½ per cent in the 1950's and 1960's to 12½ per cent in the 70's and 80's is shown in Table 1 and illustrated in Figure 1. The upward "tilt" in the repayment burden or "front end loading" problem which results from high inflation leading to high nominal interest rates can result in a considerable cash flow problem
for borrowers or would-be borrowers who are forced to commit an increasing proportion of their current income to service a given debt.\(^3\)

One of the most dramatic ways of portraying the impact of the inability of many households to undertake this additional commitment is to calculate the increased "deposit gap" which has resulted from a combination of increased house prices and increased interest rates when households on average weekly earnings commit only a fixed proportion of their income to repaying a loan. This is done in Table 2. As can be seen from this table, at the present time an average valued house in Sydney is accessible to those households on average weekly earnings and able to commit only 25 per cent of their income to repayment of a loan only if such households can find a $50,000 deposit. This means that many households, and particularly first home buyers, are effectively excluded from the housing finance market.

It has been argued that the cash flow problem, or liquidity constraint, which restricts households to a loan where repayments do not exceed a certain percentage of income is primarily a reflection of imperfections in the capital market since, with perfect capital markets, a household with an expected income stream sufficient to service a mortgage with a given present value but unable to undertake that mortgage because of inadequate current income would be able to effectively reschedule its repayment burden by borrowing a sufficient amount to cover repayments when income is low and repaying this once income has increased.\(^4\)

There have been a number of studies which, by concentrating on only one characteristic of the time profile of payments (viz., the initial repayment), have provided both theoretical arguments and empirical results to show that, for a mortgage with a given present value, the tilt in the stream of repayments which results from the use of a standard mortgage
Table 1: Effect of inflation on repayment burden with a VRM

|$30,000| 20 year mortgage | $15,000| initial income, increasing at inflation rate |

<table>
<thead>
<tr>
<th>Year</th>
<th>Monthly repayment ($)</th>
<th>Real monthly repayment ($)</th>
<th>Annual repayment/annual income (%)</th>
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<tr>
<td>Case 1: 0% inflation, 3% real rate of interest, 3% nominal rate of interest</td>
<td></td>
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<tr>
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</tr>
<tr>
<td>20</td>
<td>168</td>
<td>168</td>
<td>13.4</td>
</tr>
<tr>
<td>Case 2: 2½% inflation, 3% real rate of interest, 5½% nominal rate of interest</td>
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<td></td>
<td></td>
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<td>10.1</td>
</tr>
<tr>
<td>Case 3: 12½% inflation, 3% real rate of interest, 15½% nominal rate of interest</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>341</td>
<td>341</td>
<td>27.3</td>
</tr>
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<tr>
<td>20</td>
<td>341</td>
<td>32</td>
<td>2.6</td>
</tr>
</tbody>
</table>

a. Increasing or reducing both the size of the loan and initial income by equal proportions to give historically more realistic figures will not change the figures in the final column of the table but will change those in columns (2) and (3) by the same proportional adjustment made. Repayments calculated on basis of fixed monthly amount to fully amortize debt at end of mortgage term.
Figure 1: Effect of inflation on repayment burden with fixed nominal repayments

Real repayment: 12 1/2% inflation, 3% real rate of interest

Real repayment: 2 1/2% inflation, 3% real rate of interest

Real repayment: 0% inflation, 3% real rate of interest

a. see Table 1 for assumptions about size of mortgage and initial income
instrument with increased inflation does create an effective liquidity constraint on households and so reduces their demand for housing. These results lead to the conclusion that the introduction of alternative mortgage instruments which reduce or reverse this tilt will therefore increase the demand for housing finance.

In order to provide the flexibility needed to ease the pressures associated with inflation, however, new mortgage instruments need to satisfy the needs of both borrowers and lenders. There are three characteristics of mortgage instruments which are typically listed as desirable from the borrower’s point of view. These are:

a. choice in the repayment to income ratio over the lifetime of the mortgage

b. short-run stability in this ratio and
c. low levels of uncertainty about the real cost of the mortgage over time.

For lenders, of prime concern is immunity from problems which can arise from a mismatch of assets and liabilities, assuming that all instruments can be designed to yield the same risk adjusted rate of return.

In this paper, only those mortgage instruments which have been specifically designed to overcome the problems which borrowers face because of the increased burden of repayments in the early years of a loan will be examined. The two major alternative types of instruments which will be considered are graduated payment mortgages and shared appreciation mortgages. Other innovations such as high-start mortgages, primarily designed to appeal to households with a temporary two income status, reduced interest rate mortgages, which actually confer an additional subsidy on the borrower or reverse annuity mortgages, primarily intended as a means of enabling asset rich but income poor households to gain access to the wealth they have accumulated in their housing, will not be
Table 2:

| Year | House price $ | A.W.E. $ | Saving Bank interest rate % | Borrowing capacity $(| | Deposit gap $(| | Deposit gap/ annual income |
|------|--------------|----------|----------------------------|----------------|----------------|------------------|
| 1970 | 19500        | 79       | 8.25                       | 10023          | 9477           | 2.3              |
| 1971 | 22100        | 89       | 8.25                       | 11292          | 10808          | 2.3              |
| 1972 | 24900        | 96       | 7.75                       | 12714          | 12186          | 2.4              |
| 1973 | 28200        | 107      | 7.75                       | 14171          | 14029          | 2.5              |
| 1974 | 33400        | 128      | 9.5                        | 14650          | 18750          | 2.8              |
| 1975 | 35800        | 155      | 11.5                       | 15249          | 20551          | 2.5              |
| 1976 | 38600        | 179      | 10.5                       | 18958          | 19642          | 2.1              |
| 1977 | 41000        | 198      | 10.5                       | 20971          | 20029          | 1.9              |
| 1978 | 43700        | 216      | 10.0                       | 23770          | 19930          | 1.8              |
| 1979 | 51000        | 231      | 9.5                        | 26439          | 24561          | 2.0              |
| 1980 | 64800        | 259      | 10.5                       | 27431          | 37369          | 2.8              |
| 1981 | 77500        | 294      | 11.5                       | 28924          | 48576          | 3.2              |
| 1982 | 78000        | 329      | 13.5                       | 28225          | 49775          | 2.9              |

a. all data as at June quarter

b. Source: Abelson (1982); figures presented are for Sydney, Newcastle and Wollongong and are based on extrapolating the ABS, Cat. No. 8710.1 figures for 1976(N) - 1979(J) using rates of change of house prices calculated from Bis-Shrapnel's survey of house prices

c. Source: Seasonally Adjusted indicators, ABS Cat. No. 1308.0; Reserve Bank Bulletins for 1981, 1982.

d. Source: Reserve Bank of Australia, Occasional Paper 8A; top of range rates charged on new savings bank loans

e. based on 25 year credit foncier loan, assuming monthly repayment capacity equal to A.W.E. (i.e. approximately 25% income)
considered. Before these innovations are considered, however, the properties of the variable rate credit foncier mortgage in relation to its impact on both borrower and lender will be considered.

As already indicated, the major characteristic of a variable rate credit foncier mortgage, from the borrower's point of view, is that it results in a declining real repayment burden over time. For some households, this is seen as an advantage because they can rely on a temporary two-income status in order to meet the heavy repayment commitments in the early part of the loan; alternatively, they can ensure that the worst of the repayment burden is undertaken before their discretionary income is reduced through family commitments. Such households are unlikely to want to switch to alternative mortgage instruments such as those being considered here (which, as indicated, are limited to those alternatives which reduce initial repayments). For other households, however, it is a disadvantage because it does not take into account increased repayment capacity over time.

A further disadvantage to the borrower (whether or not declining real repayments are preferred) is that the variable rate nature of the mortgage means that there is an "interest rate risk" for the borrower who is faced with the prospect of increased repayments and possibly an increased repayment burden if interest rates rise. This risk has become real for some recent borrowers with the relatively rapid increases in interest rates which have occurred in the past few years. It should be pointed out, however, that for most borrowers the increase in repayments resulting from increased interest rates have generally been able to be met by increased incomes. For example, the recent rises in bank interest rates in Australia (from 9.5 per cent in March 1979 to 13.5 per cent in March 1982) resulted in a 23 per cent increase in nominal repayments for
households with 25 year loans. However, over this same period average weekly earnings increased by 44 per cent, thus effectively dampening the impact of these increases in the rate of interest for any household whose income kept pace with A.W.E.. Those households most at risk, of course, are those who incomes declined (for example, through loss of a job); such households, however, are at risk whatever the form of mortgage instrument used.

This cost to the borrower resulting from increased uncertainty about future repayments, however, is an advantage to the lender. It is generally argued that in an unregulated market in times of increasing interest rates VRMs provide some degree of protection to those lenders whose liabilities predominantly consist of short-term deposits, with the extent of this protection depending on whether the mortgage rate is set as a long-term or a short-term rate. Because of the unwillingness of the authorities to relax interest rate ceilings in Australia in the past decade, however, any such protection provided by the fact that mortgage rates are variable has been reduced. In principle, the extent of this protection should be reflected in a lower rate of interest being charged for a VRM than would be charged for an equivalent mortgage where the interest rate is fixed for the life of the loan.

In a deregulated market, one partial compromise to the desire of borrowers to have a relatively smooth repayment stream and of lenders to receive a return on their assets which matches the costs incurred on their liabilities is to use what is described as a dual rate VRM. This enables lenders to use a short-term interest rate as the reference rate for calculating interest owed on the mortgage but to keep a long-term rate as the reference rate for calculating repayments for the borrowers. It has the effect of varying the length of the loan if the short-term fluctuations do not cancel out in the long-run. Cohn and Fischer (1975)
claim that "because short-term rates are more volatile than long-term rates, the use of a long term payment factor results in a smoother payment stream than would a short-term payment factor. (However) because the debiting rate is a short-term one, the lender earns a short-term rate of interest on his investment, and institutional lenders could finance a portfolio of such mortgages with short-term deposits and still be hedged."

Although such an adaptation of the standard mortgage may improve its desirability from both the lender's and borrower's point of view, it still does not address the problem of reducing high initial repayment burdens. Schemes specifically designed to do this are discussed next; the first being a graduate payment mortgage.

The main characteristic of graduated payment mortgages is that repayments start at a lower level than for an equivalent VRM but increase steadily for the life of the loan, although in some modified versions payments may increase only for a fixed number of periods and then remain constant for the remaining term of the loan. As with the standard mortgage instrument discussed above, current repayments reflect the current rate of interest. However, with this instrument, early repayments do not necessarily cover the interest cost of the loan. In such cases, the outstanding principal increases by the difference between payments and current interest due so that the household is effectively borrowing additional amounts to meet the interest burden in the early years of the loan. As a result, the nominal debt outstanding can increase in the early years of the loan. In real terms, however, the debt still declines. The effect of such schemes is to significantly reduce the "tilt" in repayments, with the extent of the reduction depending on the rate of increase in repayments over time. These type of schemes, therefore, directly attack the front loading problem associated with
the use of conventional fixed or variable rate mortgages. Table 3
and Figure 2 illustrate the impact on real repayment streams of
different rates of graduation for a given rate of inflation. From
these it is obvious that the reduction in the initial payment is bought
at the expense of a more rapid increase in nominal repayments over
time (and hence a slower decline in real repayments).

If nominal interest rates reflected just the inflation component
on top of real interest rates and no additional factors (such as the
effects of taxation) then a GPM where repayments increased at the
rate of inflation would be exactly the same as a fully index-linked
mortgage. The distinguishing characteristic of an index-linked
mortgage is that the rate of interest used to calculate interest owed
and repayments is a "real" rate of interest (in other words, the rate
of interest which would apply if there were no inflation) and repayments
are also fixed in real terms (so that nominal repayments increase at
the inflation rate). As Staines (1982) points out, "conventional
housing loans compensate for inflation entirely by raising the basic
interest rate. Fully indexed loans would compensate for inflation
entirely by indexing repayments."

Obviously, one of the main disadvantages of GPMs is that household
income may not increase at the same rate as nominal repayments and so
the real repayment burden could increase rather than decline. This
possibility has led to reasonably conservative rates of graduation
being applied to nominal repayments in those GPM instruments which
have been introduced. In the U.S., for example, only five types
of GPMs are insurable under section 245 of the Housing and Community
Development Act of 1974 (Villani, 1981). Three of these have annual
repayments increasing for five years only at rates of up to 7½ per
cent. Those in which repayments increase for ten years have maximum
graduation rates of 3 per cent per annum. In Australia, the schemes
which have been announced by some of the banks following the 1982
Table 3: Effect of rate of graduation on real repayment burden with a GPM

$30,000 20 year mortgage, annual rests (monthly repayments shown
$15,000 initial income increasing at 12½% p.a.
nominal rate of interest 15½%

<table>
<thead>
<tr>
<th>year</th>
<th>rate of increase in repayments (%)</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td>0</td>
<td>410</td>
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<td>228</td>
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<td>10</td>
<td>126</td>
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<tr>
<td>15</td>
<td>70</td>
</tr>
<tr>
<td>20</td>
<td>39</td>
</tr>
</tbody>
</table>

a. calculated on basis of annual rather than monthly rests for direct comparison with remaining figures in table, but therefore not directly comparable with case 3, Table 1.
Figure 2: Effect of rate of graduation on real repayment burden with a GPM.

- Real repayment: 12½% inflation; 0% increase in repayments
- Real repayment: 12½% inflation; 2½% increase in repayments
- Real repayment: 12½% inflation; 5% increase in repayments
- Real repayment: 12½% inflation; 10% increase in repayments
- Real repayment: 12½% inflation; 12½% increase in repayments

a. See Table 3 for assumptions about size of mortgage, interest rates etc.
March housing package are, in fact, GPM schemes. The early illustrations of the National Bank scheme, for example, were based on loans with reduced terms of 15 - 20 years and had graduation rates varying from 2½ to 4½ per cent. Later illustrations have been even more conservative, being based on 15 year terms and graduation rates varying from 1½ to 3½ per cent. The impact of the reduction in the loan terms in many of these GPM schemes which have been outlined has been to considerably reduce the potential advantage to the borrower in relation to initial reduced repayments. In 1982 the standard GPM scheme actually introduced by the National Bank, for example, was based on a 2½ per cent increase in repayments and a 15 year loan. Monthly repayments on a $30,000 loan started at $341.10 only $6.70 below the repayments on a conventional 25 year loan. In this case graduated repayments would have been approximately the same as those from a conventional loan just one year after undertaking the graduated payment mortgage and would exceed them thereafter. The more common conventional loan term, however, is 20 years in which case the adoption of such a GPM scheme would result in a reduction in repayments of $21 (from $362 per month). In this case, GPM repayments would exceed those on a 20 year conventional loan only after 3 years. With this type of scheme, a 1½ per cent increase in annual nominal repayments would lead to only a $2 per month reduction in the initial repayment required on a $30,000 loan over 20 years (from $362 to $360 per month). A 10 per cent reduction in repayments, however, (from $362 to $322 per month) could be achieved by a loan where repayments increase at 3½ per cent per annum. A.N.Z. and Westpac standard loans make no pretence at attempting to protect the borrower from high initial repayments. Their new home lending policy is based on the standard repayment required to clear the loan in 20 years (that is, $362 per month on a $30,000 loans at an interest rate of 13½ per cent). As long
as the increase is within the borrower's capacity to repay, this amount will then increase by 2½ per cent per annum. As with the National Bank scheme, this is equivalent to introducing a GPM over a shorter loan period (17 years in the case of the ANZ scheme outlined). Initial repayments are reduced to 80 per cent of the standard repayment in the ANZ scheme only when repayments are set to increase at 5 per cent per annum. 9

The shortening of the loan term in those schemes which have been proposed in Australia presumably results from another disadvantage of the widespread introduction of GPMs; namely, that from the lender's point of view, any reduction in initial repayments increases any cash flow difficulties faced by the lending institutions because of the mismatching of the maturities of assets and liabilities. For the same reason, it also puts additional pressures on resources so that fewer loans can be financed in such a way in the early years of such schemes. Jackson and Kralikas (1974) calculated that for a cohort of borrowers undertaking the same size GPMs in successive years, if there was a 4 per cent increase in repayments built into the scheme, 34 per cent more funds would have to be found after 25 years to finance the scheme. With a 2 per cent increase in repayments, only 16 per cent more funds would have to be found. Alternatively, with a 4 per cent graduation in repayments, in the 25th year of operation of the scheme, for every 3 borrowers who receive a loan under the conventional system, only 2 could receive loans under a graduated payment mortgage offered for the same term. This, however, should only be a once off problem as once the institutions have well balanced portfolios of GPMs the short fall in repayments in the early years of newly issued mortgages will be offset by the increased repayments of those mortgages nearing the end of their term. 10
The shortfall in repayments in the early years of the loan also has a further difficulty associated with it. This arises from the fact that, when repayments are insufficient to cover the interest costs of the loan, the mortgage debt outstanding increases. This rise in the nominal outstanding debt is greatest in those cases where initial repayments have been reduced the most by high graduation rates being applied to nominal repayments. Figure 3 illustrates this rise in outstanding debt for different rates of increase in repayments. However, as long as the value of the house increases at least as fast as this build up in the outstanding mortgage, borrower's equity or lenders' collateral remain unaffected. It is only when the expected capital appreciation on the house is very low and when a high loan to valuation ratio has been applied that the lender need be concerned about increased risk of default on the loan because of the increased debt. In these cases, the lender may not be prepared to offer such loans unless some form of mortgage insurance was available. The graduated payment mortgages introduced in the U.S. have had the rates of interest charged on the loan and the rate of increase in repayments fixed at the outset of the loan. This means that they have no interest rate risk associated with them from the borrower's point of view. It also means that the delay in the reduction of principal makes them a not entirely satisfactory investment from the lender's point of view. Those schemes which have been proposed for Australia, however, do appear to have this risk reduced for the lender (and so increased for the borrower) by the provision that any subsequent increase in interest rates after the loan has been made will result in an increase in the rate of repayment by the same amount. For the hypothetical examples presented in Table 3, if interest rates increased by one percentage point just after a loan
Figure 3: Principal outstanding with a GPM.a.

PRINCIPAL OWING AT END OF YEAR

15% Increase in Repayments

10% Increase in Repayments

5% Increase in Repayments

YEARS

0 2 4 6 8 10 12 14 16 18 20 22 24 26

a. $30,000 loan, 10% rate of interest

Source: Jackson and Kralikas (1974)
based on a 2½ per cent increase for 20 years had been taken out, the
increase in the rate of repayment to 3½ per cent would reduce the loan
term to 15 or 16 years (and hence would reduce the risk to the lender by
increasing cash flow and shortening the term to maturity). 28 In a scheme
based on a rate of interest of 13½ per cent and an annual increase in
repayments of 3½ per cent for 15 years, a one percentage point increase
in the rate of repayment within a year of the loan being undertaken would
mean the loan term was reduced to 13 years with repayments increasing
again at 4½ per cent per annum.

These difficulties notwithstanding the introduction of graduated
payment mortgages can be expected to increase the demand for housing
and finance both by increasing access to those households currently excluded
because of the cash flow constraint in the early years of a conventional
loan and by enabling households currently able to afford a conventional
and loan to increase their demand for housing. These increases in
demand, are likely to place considerable pressures on institutions
currently lending for housing and could result in higher rates of interest
being charged for all housing loans, thus reducing some of the impact
of reduced initial payments. They could, of course, also place considerable
pressures on house prices if the increased demand for funds was met by
an increased availability of funds. To ensure that such schemes do
provide assistance to those who need it, it has been suggested (Jackson
and Kralikas, 1974) that they be either restricted to first home owners,
or restricted according to level of income.

The second and more recent mortgage innovation designed to overcome
the front loading problems associated with the use of a standard mortgage
which is to be discussed in this paper is a shared appreciation mortgage.
As the name implies, a shared appreciation mortgage is a mortgage loan
in which the borrower agrees to pay the lender a pre-specified share of
any appreciation in the property in return for a discounted rate of interest on his loan. Such a proposal is specifically designed to reduce the immediate cash requirements of the borrower, with the borrower effectively borrowing against expected appreciation of the dwelling. This becomes due either when the property is sold or after a specified number of years, usually considerably less than the term of the loan. A SAM can be thought of as a two-part loan, with the first part equal to the discounted or present value of the lender's share in the expected appreciation of the property and the second part equal to the difference between this and the total loan. Repayments to amortize the whole loan over its full term are calculated on the basis of market rates of interest only on this second part of the loan. This, of course, is equivalent to a discounted rate of interest on the full loan. The first part of the loan is paid for from the appreciated value of the property. If, after the specified number of years, the borrower does not wish to sell the property he must undertake to refinance this (now appreciated) first part of the loan at market rates of interest with funds provided by the lender. In this way the borrower is partially protected from the "interest rate risk" associated with an increase in nominal interest rates with increased inflation because the income used to repay part of the loan is derived from the increased value of the property rather than from increased earned income. Thus, the lender shares part of the risk that income, or capital appreciation, does not rise with inflation. If capital appreciation is greater than expected (e.g. greater than inflation, or greater than the assumed average rate of appreciation) and is expected to continue to be greater, it will pay the borrower to prepay the loan and refinance it with a more conventional loan.
McKenzie (1980) points out that if this first part of the loan had to be refinanced each year and the lender's share of the appreciation always equalled the actual loan to valuation ratio (i.e., if LVR is 60 per cent, then lender receives 60 per cent of any capital appreciation) then this scheme would, in fact, operate in the same way as a fully indexed GPM where the index rate is equal to the rate of capital appreciation of the property.

An alternative and simpler way of achieving much the same result is to regard the loan as a deferred interest loan where the borrower pays a reduced rate of interest on the loan and defers the payment of the difference between the market rate and the rate paid until a specified period of time when it can either be paid for out of accumulated equity in the property or when the original loan plus interest due can be refinanced.

Freiberg (1982) lists a large number of factors which affect the relative profitability of SAMs. Those which are known at the time of undertaking such a mortgage are the purchase price of the property and the conventional mortgage rate at the time of the loan; those which are unknown are the market rate of interest in each subsequent year, the housing appreciation rate and the number of years before the house is sold; those which are negotiable at the time of undertaking the mortgage are the size of the mortgage, the discounted mortgage rate on the loan, the length of the mortgage period and the participation rate for the lender. For given assumptions about future interest rates and house price appreciation Freiberg shows how down-payment, lender participation and the size of discount can be adjusted to provide an acceptable rate of return for the lender.
There are a number of difficulties associated with determining the appropriate basis for SAMs; some decision, for example, needs to be reached on how capital appreciation is to be determined and how any 'improvements' undertaken by the borrower are to be taken into account. Similarly, some decision needs to be made as to whether any risk premium is necessary on SAMs because of the fact that such mortgage instruments may only be attractive to lower income households purchasing properties with below average expected rates of appreciation; in other words, there may be some adverse selection risk involved. Some decision also needs to be made about whether prepayment penalties should be imposed to ensure that borrowers taking advantage of such schemes when interest rates are high and rates of capital appreciation low do not refinance as soon as interest rates start to fall and house values start to rise.

The advantages of such a scheme to the borrower are obvious; by reducing initial repayments a SAM provides access or increased access to homeownership for those households with little accumulated assets or equity in housing. The borrower also gains access to at least some of the expected capital gains on the property. The disadvantage primarily comes from the fact that the borrower is either faced with a large jump in repayments when the first part of the loan becomes due or with the prospect of selling his property. Such instruments, therefore, are likely to appeal to those households who expect to live in a particular dwelling for only a short-period of time. SAMs do not eliminate the 'interest rate risk' associated with increased inflation but, as pointed out, do reduce it in part by shifting some of the burden to lender. In return for this, of course, the lender may well require a higher return on such mortgages in order to be induced to undertake them. This response may reduce the attractiveness of such mortgages.

For a lender McKenzie (1980) argues that a SAM is a form of portfolio indexing and that "if actual inflation (and property appreciation)
exceeds expected inflation, then the yield on a SAM will exceed the expected yield at the time of origination ... Thus, a portfolio of SAMs allows for a partial hedging of unexpected changes in the inflation rate. It also has the effect of shortening the average maturity of mortgage loans but despite this still results in cash flow problems in the early years compared with a conventional mortgage. As with GPMs, however, this is a short-term problem only since once a well-balanced portfolio of SAMs is held the initial poor cash flows on new loans are offset by increased cash flows (vis a vis conventional mortgages) in the later stages of existing loans. Because of their inflation hedging characteristics it is often argued that SAMs are more likely to be preferred by lenders, such as insurance companies, with long term liabilities.

As already indicated above, the mortgage instrument which has been predominantly used in the past is that which provides lenders with the best scope for minimising any problems associated with the mismatch of the maturities of assets and liabilities. Consequently, there will be little incentive to lenders to introduce new mortgage instruments while there is sufficient demand for available funds under existing arrangements. The failure of interest rate regulations to move in line with market rates generally has meant that over the past decade, despite generally high interest rates, the demand for housing finance has generally exceeded the supply. It is only since 1982 that the combination of a general easing of market rates of interest, changes in interest rate regulations, increased government subsidies for would-be owner-occupiers and an agreement on the part of the banks to lend more for housing has led to indications that the demand for and supply of housing funds are more or less in balance at the prevailing rates of interest and with the conventional mortgage instrument still being that predominantly
used.

In order to encourage the widespread introduction of more flexible mortgage instruments it is necessary to remove the existing lack of incentive on the lender's side. This will be done by any move which increases the supply of funds available for lending or by changing the liabilities side of the balance sheet so that lenders for housing no longer rely predominantly on short-term deposits. The introduction of longer-term deposits or index linked bonds and the like will all serve to lengthen the maturity structure of liabilities and hence provide increased incentives for lenders to switch to alternative mortgage instruments. Successful innovations on the liabilities side of the balance sheet are almost certain to require changes in taxation arrangements to ensure their attractiveness. In the shorter term, of course, the cash flow problems which arise from deferred repayment schemes can be offset by the simultaneous introductions of high-start mortgages (in which the tilt in the repayment burden under a credit foncier mortgage is accentuated rather than reduced).

The conclusion which can be derived from the points made in this paper is that, unless there is an increase in the supply of funds being made available for housing finance, the introduction of alternative mortgage instruments will have very few social or distributional implications.

In general, low income households cannot compete with households with a greater saving capacity and a greater repayment capacity for a limited supply of housing finance or for high cost finance. While the distribution of funds available for housing is left to the market place, such households will be excluded from access. In the past, the non-price rationing criteria introduced by necessity to ration an inadequate supply of finance at a regulated rate of interest have been effective in
preventing lower income households from gaining access to this housing finance. Price rationing will have the same effect although the income and wealth characteristics of marginal borrowers may be slightly different under price rather than non-price rationing. In an unregulated environment innovations can be used to offset the effects of increased interest rates but there is little reason for them to be used to extend access to housing finance to those currently unable to afford it if there is no increase in the supply of funds available. If the supply of funds available decreases there is even less incentive to innovate.

Low income households can be assisted into home-ownership by the extension of policies specifically designed to increase the supply of funds directed towards this group. Such policies can either be introduced through the budget (for example, by increasing rather than cutting back funds allocated under the Home Purchase Assistance scheme) or by changing the nature of the existing regulations on financial intermediaries (for example, by requiring all financial intermediaries to lend a given proportion of funds to low income households). Once this is done, flexible mortgage instruments will be essential in ensuring that maximum benefit can be derived from such funds and that unnecessary subsidies are not implemented simply to overcome short-term liquidity constraints. The viability of such schemes in these cases may well be enhanced by the use of loan insurance schemes.
Footnotes:

* A version of this paper was presented at the 8th Australian School of Administration, organised by the Building Societies Institute and held in Perth in December 1982. I would like to thank the organisers of this school for encouraging me to prepare this paper. I would also like to thank Mary Donnelly, Geoff Gloster, Tony Phipps and Rick Turner for their constructive comments on an earlier draft. The views contained in the paper are my own and in no way should be attributed either to the above individuals or to the institutions they represent.

1. In Australia, this response of interest rates to inflation has been slow. Stammer and Valentine (1982) argue that this may, in part, have been due to the unwillingness of authorities to change controlled rates but point out that slow adjustment has also been a characteristic of market determined rates. They attribute this primarily to the fact that for most investors "there is no alternative asset with a return which increases with inflation (i.e. an inflation hedge) and the absence of such an alternative means that there is no market pressure to push nominal interest rates up when inflation increases", to the impact of exchange rate expectations and to a long lag in the reaction of interest rates to changes in the rate of inflation.

2. The fact that the increase in the nominal rate of interest, designed to compensate the lender for inflation, does not necessarily increase the real cost to the borrower can readily be seen by pointing out that, as long as the price of the house being bought increases in line with inflation, the inflation premiums paid by the borrower will eventually be recaptured in the increased capital value of the house.

3. It must be pointed out that this tilt in the repayment burden only arises from an increase in nominal interest rates arising from inflation. Any increase in nominal rates arising from increased real rates of interest will increase the real repayment burden at all levels of income.

4. A perfect capital market would take into account the risk associated with the failure of income to rise as expected in the rate of interest charged for such a loan.

5. Schwab (1982), using a two-sector intertemporal utility model, for example, shows that the forced saving which results from an increase in expected inflation when standard mortgage instruments are used to finance housing, results in a decrease in the demand for housing. He shows that consumers are not indifferent to the breakdown of the nominal interest rate into its real and inflation components and
concludes that the demand for housing is not solely based on real variables.

Kearl (1979) presents empirical results which indicate that the price of housing is responsive to both the initial repayments required and to the tilt of the repayment stream. He concludes that even if inflation is fully anticipated and there is complete adjustment to it, its effect is not neutral because the demand for housing is distorted. By running simulations using indexed rather than standard mortgages he shows that removal of the distortion created by fixed nominal repayments on mortgages increases the demand for (and price of) housing.

Follain and Struyk (1977) examine the impact of alternative mortgage instruments on home ownership rates by concentrating on the impact that these instruments have on the initial repayment to income ratio (for a mortgage with a given present value). They conclude that the home-ownership effects are substantial, especially for the lowest income groups with full-scale use of different instruments changing home ownership rates by anything up to 6 percentage points.

Jaffee and Kearl (1975) likewise concentrate on the impact of initial payment changes but do so in the context of a more complete model which allows for both the demand and supply effects of alternative mortgage instruments. They similarly conclude that the widespread adoption of such instruments could have significant effects on the demand for and supply of mortgages.

6. These have been taken from Cohn and Fischer (1975) and Smith (1976). Both papers take care to point out that not all households will prefer a stable repayment to income ratio over the lifetime of the mortgage.

7. See, for example, Revell (1975).

8. This information was provided by Geoff Gloster of the National Bank. He points out that a 25 year conventional loan, whilst available from National, is not available from all savings banks and the more common loan term is, in fact, 20 years.

9. Rick Turner points out that the widespread adoption of such schemes would take much of the political heat out of interest rate increases as repayments would be less sensitive to rate increases.

10. With the GPM's actually introduced in Australia, the shortened loan term means that more loans can be issued from a given supply of funds after only a few years.

11. This applies without qualification only to the National scheme. For both ANZ and Westpac, increases in interest rates of up to 2.5 per cent are absorbed by an increased loan term (of up to 20 years).

12. In February 1983 the Ramsay Trust, with the backing of the S.A. government, attempted to raise funds by offering non-interest bearing capital indexed debentures where the capital amount subscribed was to be linked to the CPI. The claim made for this scheme was
"except as it may be affected by taxation, the debenture offers a means of safe saving at any rate of inflation". Expectations at the time of the loan were that any inflation induced capital gain would be taxed as income. The Trust managed to reach less than 15 per cent of its target and folded.

13. This second alternative still has the disadvantage of leaving the allocation of these funds to the market. There is no guarantee that beneficiaries will not simply be those households whose current incomes are low but whose income earning potential is high.
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A Strategy for Winning at Roulette
<table>
<thead>
<tr>
<th>Page</th>
<th>Author(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>R.L. Brown</td>
<td>A Test of the Black and Scholes Model of Option Valuation in Australia</td>
</tr>
<tr>
<td>23</td>
<td>I.G. Sharpe &amp; P.A. Volker</td>
<td>The Selection of Monetary Policy Instruments: Evidence from Reduced Form Estimates of the Demand and Supply of Money in Australia</td>
</tr>
<tr>
<td>24</td>
<td>V.B. Hall</td>
<td>Excess Demand and Expectations Influences on Price Changes in Australian Manufacturing Industry</td>
</tr>
<tr>
<td>25</td>
<td>I.G. Sharpe &amp; P.A. Volker</td>
<td>The Tradeoff Between Improved Monetary Control and Market Interest Rate Variability in Australia: An Application of Optimal Control Techniques</td>
</tr>
<tr>
<td>26</td>
<td>Evan Jones with the assistance of Mary MacDonald</td>
<td>An Examination of Earnings Differentials in Australian Manufacturing Industry</td>
</tr>
<tr>
<td>27</td>
<td>W.P. Hogan</td>
<td>Questions on Structural Adjustment Policies</td>
</tr>
<tr>
<td>28</td>
<td>P. Saunders</td>
<td>Price and Cost Expectations in Australian Manufacturing Firms</td>
</tr>
<tr>
<td>29</td>
<td>W.P. Hogan, I.G. Sharpe &amp; P.A. Volker</td>
<td>Regulation, Risk and the Pricing of Australian Bank Shares 1957-1976</td>
</tr>
<tr>
<td>30</td>
<td>W.P. Hogan</td>
<td>Quicksands of Policy-Making</td>
</tr>
<tr>
<td>31</td>
<td>C. Emerson</td>
<td>Taxing Natural Resources Projects</td>
</tr>
<tr>
<td>32</td>
<td>R.W. Bailey, V.B. Hall &amp; P.C.B. Phillips</td>
<td>A Small Model of Output, Employment, Capital Formation and Inflation, applied to the New Zealand Economy</td>
</tr>
<tr>
<td>33</td>
<td>W.P. Hogan</td>
<td>Eurofinancing: Currencies, Loans and Bonds</td>
</tr>
<tr>
<td>35</td>
<td>W.P. Hogan</td>
<td>The 40 Per Cent Investment Allowance</td>
</tr>
<tr>
<td>36</td>
<td>W.P. Hogan</td>
<td>Controlling Eurofinance Markets</td>
</tr>
<tr>
<td>37</td>
<td>R.T. Ross</td>
<td>Disaggregate Labour Supply Functions for Married Women: Preliminary Estimates for New Zealand</td>
</tr>
<tr>
<td>Page</td>
<td>Author(s)</td>
<td>Title</td>
</tr>
<tr>
<td>------</td>
<td>------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>39</td>
<td>G. Mills</td>
<td>Government Incentive Contracts with Private Companies: Some Lessons from the Channel Tunnel</td>
</tr>
<tr>
<td>40</td>
<td>C.G.P. Simkin</td>
<td>Closer Economic Relations Between Australia and New Zealand</td>
</tr>
<tr>
<td>41</td>
<td>U.R. Kohli</td>
<td>Relative Price Effects and the Demand for Imports</td>
</tr>
<tr>
<td>42</td>
<td>W.J. Merrilees</td>
<td>Alternative Models of Apprentice Recruitment: with Special Reference to the British Engineering Industry</td>
</tr>
<tr>
<td>43</td>
<td>P. Saunders</td>
<td>Price Determination in Australian Manufacturing Firms: A Cross-Section Study</td>
</tr>
<tr>
<td>44</td>
<td>W.P. Hogan</td>
<td>Immigration Policies and Issues</td>
</tr>
<tr>
<td>45</td>
<td>W.J. Merrilees</td>
<td>Labour Market Segmentation in Canada: A Translog Approach</td>
</tr>
<tr>
<td>46</td>
<td>W.J. Merrilees</td>
<td>Pricing Strategies in the Newspaper Industry</td>
</tr>
<tr>
<td>47</td>
<td>J.L. Whitteman</td>
<td>The Micro-Foundations of Layoffs and Labour-Hoarding</td>
</tr>
<tr>
<td>49</td>
<td>U.R. Kohli</td>
<td>Nonjoint Technologies</td>
</tr>
<tr>
<td>50</td>
<td>P. Saunders</td>
<td>Price Determination, Expectations Formation and some Tests of the Rationality of Australian Price Expectations</td>
</tr>
<tr>
<td>51</td>
<td>J.L. Whitteman</td>
<td>Rational Choice, Learning-By-Doing and the Personal Distribution of Income.</td>
</tr>
<tr>
<td>52</td>
<td>J.L. Whitteman</td>
<td>Firm-Specific Human Capital, Experience and the Differential Incidence of Unemployment.</td>
</tr>
<tr>
<td>53</td>
<td>J. Yates</td>
<td>An Analysis of Asset Holdings in Australia By Income Class.</td>
</tr>
<tr>
<td>54</td>
<td>J. Yates</td>
<td>An Analysis of the Distributional Impact of Imputed Rent Taxation.</td>
</tr>
<tr>
<td>55</td>
<td>G. Mills</td>
<td>Investment in Airport Capacity - A Critical Review of the MANS Study</td>
</tr>
<tr>
<td>56</td>
<td>V.B. Hall &amp; P. Saunders</td>
<td>Pricing Models in Australian Manufacturing The Evidence From Survey Data.</td>
</tr>
<tr>
<td>57</td>
<td>P. Saunders</td>
<td>How Rational are Australian Price Expectations?</td>
</tr>
<tr>
<td>58</td>
<td>F. Gill</td>
<td>The Costs of Adjustment and the Invisible Hand with Special Reference to the Labour Market</td>
</tr>
</tbody>
</table>
59 G. Mills & W. Coleman
Peak Load Pricing and the Channel Tunnel: A Re-Examination

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The Gatt Agreement on Government Procurements: Canada and Australia.

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<table>
<thead>
<tr>
<th>No.</th>
<th>Author(s)</th>
<th>Journal/Title</th>
<th>Volume/Issue</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>V.B. Hall &amp; M.L. King</td>
<td><em>New Zealand Economic Papers</em></td>
<td></td>
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</tr>
</tbody>
</table>
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