The Concept of Housing Finance

One of the most cherished dreams of an individual is to own a house. When an individual purchases a house he will reap the long-term benefits of acquiring equity and actually acquires psychological advantage of owning one of the most desired assets - a house. Homeownership is “inherently desirable and naturally superior to other forms of tenure, and that given accessibility and adequate resources, all households would choose to own” (Kemeny, 1981). This has shaped the housing policies of United Kingdom, United States and Australia. In addition, homeownership rate is higher amongst those in higher socio-economic group. For example, in Britain, about 91% of professionals against 21% of manual workers are home owners. This is because high amount of investment is involved in owning a house. The average ratio of housing value to annual income was found to be 5.5 in a sample of 11 developing countries while it was 3.0 in the two developed countries (World Development Report, 1989). Thus, Finance for housing is the primary determinant of demand for owner-occupied housing as there is considerable gap between the savings of an individual and the cost of the asset. This gap can be bridged either through loan from a friend or relative or from sophisticated financial intermediaries. Renaud (1999) observed that “the way cities are built reflects the way they are financed, because methods of financing dictate modes of construction”. Thus, finance is the important factor for the demand for housing.

One way of understanding the meaning of housing finance is looking at the sources. Investment flows into this sector are comprised of:

i. finance that is available from the government

ii. earned income and
iii. private income.

Housing finance includes:

i. government subsidies to landlords and households.

ii. the owned income of the households in maintaining and improving their housing.

iii. private finance from mortgage lenders and financial institutions.

iv. the accumulated wealth to be used to fund housing and non housing activities.

The requirement of housing finance comes from those who do not have sufficient savings to acquire the asset. On the other there are people who have both of the assets i.e. house and surplus fund. Thus, a system may be developed to attract the latter group of people whose funds can be utilized to fill the vacuum. In other words it refers to transfer of savings from the elderly, who are not potential homebuyers to the younger people who require funds to acquire the asset.

The non-availability of the rented sector induces individuals to purchase their house at a much early age for fulfilling their shelter needs. This would result dependence on housing finance. Generally speaking, the higher the level of owner occupation, the greater the need of fund for the buyers. United Kingdom is the best example where a substantial rented sector is absent. In such a situation, the housing finance system has to operate efficiently for fulfilling the shelter needs of the population. An interesting exception is found in the case of Switzerland, which has a sophisticated housing finance system, though it has a low level of owner occupation (Boéat, 1985)

An effective housing finance system leads to housing loans available to qualified borrowers without excessive delay. The relative cost, in such a system, is in conformity with the cost of overall credit in the economy. The system should be such to absorb
moderate exogenous shocks and also be comprised of efficient financial instruments to meet diverse consumer needs.

There are various methods of estimating the investment flows into the housing sector. The most commonly used method refers to contributions made by the formal and informal sectors (Figure: 3.1). The contribution of the former comprises of budgetary allocations of the state and the central government and institutional finance from financial intermediaries. Thus, housing finance in this sector comprises of (a) bulk credit (finance from apex level institutions) and (b) retail credit (finance by housing finance institutions). The informal sector, on the other hand, covers loans from friends, relatives, and employers.

Thus, housing finance includes the following broad categories of investment flows into the housing sector:

i. Financial assistance by central and state government (budgetary allocation).

ii. Direct participation of the government in sites and services projects.

iii. Financial intermediation (mortgage bank, contractual saving for housing, mortgage backed securitisation and various deposit taking route).

iv. Informal loans (direct route).

Formal housing finance includes financial assistance by central and state government (budgetary allocation). Governments often directly participate in projects. ‘Public housing’, ‘upgrading squatters and slums’ and ‘sites-and-services’ (discussed in chapter 2) are instances of governments direct participation in the housing sector.
Retail financing of housing loans, on the other, is made through financial intermediation by general and financial institutions. In this case the financial intermediaries raise finance from the household or the financial market and make housing loans to the individuals directly. This takes the following three routes.

- Mortgage bank
- Contractual saving for housing (CSH)
- Deposit-taking route (Thrifts and Savings bank)

**Types of Housing Finance System**

The primary function of housing finance system is transfer of funds from the net savers to the potential home owners. A longer tenure of loan is possible only if the housing finance system achieves a certain degree of maturity, since a longer tenure implies more faith in the system. There can be four basic kinds of housing finance system depending on the four specific routes comprising the direct route, contractual system, deposit taking system and the mortgage bank system.
- **The Direct Route**

Non institutional source includes family savings, assistance from friends and other relatives and also includes loans from employees and credit unions. Typically, the older people lend money to their children to enable them to purchase house. Informal credit is 72% in developing countries in contrast to 40% in Organisation for Economic Cooperation and Development (OECD) countries (World Development Report, 1989). In advanced economies, this route became popular when the established financial mechanisms were not working improperly. 'Creative financing' was extensively used in the USA in the late 1970's and early 1980's when housing finance system of the country suffered a major crisis. In this case the vendor does not advance loan directly to the purchaser, rather, he sells a house against a deferred payment of the purchase price. This subsystem of housing finance is being increasingly acknowledged. It is regarded as a positive and productive complement to the formal sector (Asian Development Bank, 1983, p18).

This system is criticized as it is regarded as an ineffective form of financial intermediation as the requirement of the borrowers and the lenders seldom match. Thus, the parties have to make adjustments to their financial needs. The non-availability of standard financial instrument is the most critical failure of this route. This route is predominantly used in developing countries because of the immaturity of financial intermediation process. Unavailability of proper collaterals and improper property rights along with unfavourable regulations caused serious concerns in the housing finance system. In these countries the adverse macroeconomic conditions also resulted in increase in the interest rates on mortgages. This made mortgage loans more unaffordable. It has been observed that informal systems of housing finance do work because they are suited to the conditions in which they operate (Bolat 1987a).
• The Contractual System

It is observed that there is considerable gap between the cost of a house and the savings of an individual. However, the regular savings can later be effectively utilized in accumulating funds for purchase of the desired house. In the contractual system an individual makes regular savings at an interest rate below the market level and at maturity, the investor becomes entitled to a house building loan (three to four times his accumulated savings). Generally, the government provides bonus, which makes these schemes attractive.

This system is suited to countries where people do not purchase their houses until a relatively later age as that would give them ample opportunities to accumulate handsome savings. The system works very well in countries where there is a substantial rented sector, used by the people to house themselves before they are financially solvent to purchase their own house. The system has worked effectively in Germany through special institutions, the Bausparkassen, and in France through housing saving institutions. In India, a similar system, Home Loan Account Scheme (HLAS) introduced by the National Housing Bank, has been operating successfully though not as effectively as Bausparkassen in Germany.

The main shortcoming is that the system fails to provide sufficient funds for house purchase. The scheme may provide a maximum of half of the financial requirement of the buyer. Thus, the system, it is opined, has to be operated in combination with other systems. The use of social security funds to provide housing loans which is prevalent in developing countries may be considered as further modification to this system. The use of social security funds for house purchase is very common in Brazil, Mexico and Philippines.
• **The Deposit Taking System**

In this system the financial intermediaries raise short term deposits from the personal sector and lend long term for housing. These intermediaries may be commercial banks, savings banks or specialized financial institutions. While the specialized institutions, known as Building Societies (UK) and Savings and Loan Association (USA) lend exclusively for housing, the commercial banks and the savings banks allocate only a portion of the deposits for housing. The commercial banks and the savings banks do not have mandate on their loaning activity. One of the important aspects of these institutions is their intricate branch network which helps them to mobilize household savings of the rural and backward areas. Through their branches they can cater the housing needs of the people in the rural and backward areas, as well. This ensures a balanced growth of the housing sector. The specialized institutions, on the other, are conduits of the housing policies of the government and thus, have clear mandate to financially assist the housing sector. These institutions, generally, do not access the capital market for finance. Their deposits are generally short term in nature, but the loans they provide are longer termed. Thus, the institutions suffer from asset-liability mismatch.

• **The Mortgage Bank System**

The Mortgage Bank or mortgage bond system is a system in which a specialized institution advances housing loan and sells bonds in capital market to finance the loan. The loans are made generally at fixed rate of interest and the bonds are issued at market rate. Thus, an efficient bond market is the primary necessity for the system to operate. The bond market can efficiently work only when the institutional investors can freely operate without any intervention by the government. This may also be considered as the biggest

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1 In India, the specialized housing finance institutions have grown more as mortgage banks and not as 'thrifts'. Thus these institutions have more access to the capital market and do not exclusively depend on the household sector for finance.
problem of this system. The system is not very popular in the developing countries as the financial market is at its nascent stage. The system is becoming popular in those countries which are in the process of financial liberalization (financial liberalization assists the capital market to become more efficient that helps the mortgage banks to raise money more competitively from the capital market). Deposits are generally not raised by these institutions as they donot have access to the household sector through branch networks. Also, regulations may be such that they are not able to raise deposits. It is observed that Housing Development Finance Corporation Ltd, a mortgage bank in India, depended much on public deposits, at least, in the initial years for financing its housing loans. The bonds issued by mortgage banks are purchased by insurance companies, pension funds, banks, and other institutional investors. Even individuals can directly purchase such bonds. Often, it is observed that the governments issue guidelines for institutional investors to subscribe a stipulated percentage of mortgage bonds. The government may also declare tax benefit to the subscribers for such bonds.

A variation in this system has developed in the United States, where the mortgage banks originate\(^2\) and service\(^3\) housing loans which are sold to institutional investors. The bank in such a situation secures guarantee before selling it off.

\(^2\) When the loans are initiated the loans are said to be originated.

\(^3\) Servicing of loans means the process of collection of equated monthly instalments, resetting of interest rate, collection of prepayments and initiating the foreclosure process in case of default.
Types of Housing Finance Institutions

There are five types of financial institutions which are operative in advancing housing loans. Two of them are general purpose financial institutions, while the other three are specialized housing finance institutions. In most of the countries these types of institutions coexist. In developing countries we find government agencies to act as mortgage banks in the housing finance market.

- **General Banks**

  General banks are also called as joint stock banks, commercial banks or deposit taking banks. These are full service banks, providing range of retail, wholesale and international banking services. Thus, advancing of housing loan is one of the various banking services they undertake. The bank’s investment in the housing sector, through housing loan or through subscription of bonds issued by housing finance institutions is, typically around 20% (Bolet, 1985). Most of the big banks of the world are significant contributor in the housing sector. For example, the Crédit Agricole in France is the largest general purpose bank which is also the biggest contributor in the housing sector. These banks may also have significant stake in the specialized housing finance institutions. For example, the large deposit taking banks of West Germany have stake in Bausparkassen and the mortgage banks. In India, the housing loan portfolio of the commercial banks has increased significantly over the years. In 2006, State Banks of India, a commercial bank is the found to be largest provider of housing loans in India.

- **Savings Banks**

  Savings banks raise funds entirely from the household sector and lend to the personal sector and also to small businesses. In some countries, savings banks are very big in nature and provide an array of banking services. Typically housing loans account for 20% to 50% of the assets of the banks. In some countries savings banks own mortgage
banks and therefore have indirect influence on the housing finance market. In Germany an interesting group of savings bank, namely, Landesbank are in operation which control the Bausparkassen and other mortgage banks, as well.

- **Special Savings Banks**

  These are also savings banks that specialize in housing loans. They generally utilize 80% (approximately) of their loan portfolio in housing loan. In UK, Australia, South Africa and New Zealand they are called building societies. They are also called mortgage loan companies in Canada and savings and loan associations in USA and South America (Boldai, 1985). The distinction between savings bank and special savings bank is unclear except for the fact that special savings banks have a mandate for providing housing loans while in case of savings banks housing loans compete with other loans and thus, the savings bank have much lesser proportion of housing loans in their total loan portfolio.

- **Contractual Institutions**

  These institutions accept deposits (interest rate lower than market rate) from individuals. The housing loans, advanced by the institution, depend on the accumulated savings of the depositor. The Bausparkassen of West Germany and Credit Foncier of France are examples of such institutions. The HLAS of the National Housing Bank in India is another example. In this case the NHB is not a contractual institution by itself. It has a scheme called the HLAS which operates on the same limit as the contractual route of housing finance. Since the housing loan depends on the accumulated savings of the individuals, the loan often falls short of the requirement. As such, contractual institutions cannot thrive independently. In France, these institutions are controlled by general financial institutions or specialized mortgage banks.
Mortgage Banks are not deposit taking institutions thus they do not have substantial branch network. These institutions raise funds from the capital market through issuance of bonds. Mortgage banks are either independent institutions or governed by general purpose banks.

Mortgage loan – Genesis, Evolution, Types and Technicalities

The post World War housing policies of America and Britain was dominated by the concept of supremacy of homeownership. Thus, the rate of homeownership was very high in the USA. It increased from 45% in 1930s to 65% in 1980s. Since then, it has not shown much improvement (66% in 1998). Rate of homeownership is predominantly shaped by the housing finance system where the main financial instrument is the mortgage loan. The genesis and evolution of the mortgage loan can be traced mainly to USA. In literature, it is found that prior to 1930s the mortgage industry in USA was restrictive in nature and was regional. In 1890, only 28% of all non-farm owner-occupied houses were mortgaged. During that time, lenders required large down payments and the tenure of the loan was never beyond five to seven years. The loan to value ratio never exceeded 50% which implied that the proportion of financial intermediation was less, the financial burden of the repayment was high and as a consequence the whole process failed to attain its objective. The National Housing Act established the Federal Housing Administration (FHA) in 1934. The FHA introduced mortgage loan insurance program to provide insurance against credit risk in housing loan to the lenders. This brought confidence in the system and the lenders started extending longer term housing loans (15 to 20 years) which required lower down payments and this led to the long term amortization loans. The terms of the loan were so beneficial that it changed the total complexion of the housing finance
sector in USA. By 1980s, about $\frac{2}{3}$rd of all non-farm owner-occupied houses were mortgaged and more than $\frac{4}{5}$th of all house purchase was through this mortgage system. Nevitt (1966) commented that 'the 19th Century invention of the amortized loan is of such importance ....... that it ranks with the invention of steam engine in changing the face of Britain'. The mortgage loan was generally a long term loan with a loan to value ratio (LTV) of 80% to 85% (requiring 20% to 15% down payment). The loan was initiated with the application of the borrower. The application was appraised by the lender (credit appraisal, technical appraisal and legal appraisal). Credit appraisal was done for appraising the credit worthiness of the borrower. Technical appraisal was done to scrutinize the technical aspects of the loan and legal appraisal was performed to check the legal documents of the property.

Before the great depression of 1929 the mortgage loan was short tenured (5 to 7 years) and required high down payment (LTV of 50%). The 'interest only' loans were structured in a manner that the borrower was required to make regular payments of interest on the loan and the principal was due at the end of the loan. These loans were also called balloon payment loans as the principal was to be paid at the end of the term of the loan which required huge financial outflow. In absence of foreclosure laws the property was considered as proper collateral. The difficult terms of the loan made house purchase almost unaffordable. Also shorter tenure and balloon payments accounted for higher credit risk. In the next few lines the specific types of the mortgage loans (amortization loans) are discussed.

- **The Constant Amortization Loan (CAM)**

In 1934, with creation of the FHA, the lenders started the constant amortization mortgage loan (CAM) which was a longer-term full-amortization loan with monthly payments consisting of partial repayment of the outstanding principal. The monthly
payment comprised of a constant amount (value of the loan ÷ total repayment period) applied towards adjustment of principal amount of the loan. The other portion of the monthly payment was the interest component calculated as a percentage (contract rate) on the outstanding balance of the loan.

The amortization schedule of a 20 year, Rs 100000 loan carrying a contract rate of 12% would be as follows (Table 3.1). In this case the constant amortization would be Rs 416.667 (100000/240).

| Table 3.1: Amortization Schedule (Constant Amortization Mortgage Loan) |
|-----------------|----------------|----------------|----------------|-----------------|----------------|
| Month | Opening Balance | Interest | Amortization | Monthly payment | Closing Balance |
| 1 | 100000.00 | 933.33 | 416.67 | 1350.00 | 99583.33 |
| 2 | 99583.33 | 929.44 | 416.67 | 1346.11 | 99166.66 |
| 3 | 99166.66 | 925.56 | 416.67 | 1342.23 | 98749.99 |
| 4 | 98749.99 | 921.67 | 416.67 | 1338.34 | 98333.32 |
| 5 | 98333.32 | 917.78 | 416.67 | 1334.45 | 97916.65 |
| 6 | 97916.65 | 913.89 | 416.67 | 1330.56 | 97499.98 |
| 7 | 97499.98 | 910.00 | 416.67 | 1326.67 | 97083.31 |

The computations show that the initial monthly payment of Rs 1350 included an amortization of Rs 416.67, plus interest computed on the balance of the loan. And the principal decrease constantly by Rs 416.67. Thus the interest will decrease by Rs 4.1667 (416.67 × 0.12 ÷ 12). And the total monthly payment will decrease by a similar amount. The loan payment and the amortization pattern are shown in Figure 3.2.
The constant amortization mortgage was a short lived phenomenon as it failed to appreciate the fact that borrower's real income was more likely to increase (monthly repayment declined in this case). Thus, the constant payment mortgage (CPM), evolved during the post depression era, remained to be the most popular financial instrument in real estate finance even today. The payment pattern was structured in such a way that a level or constant monthly payment was calculated on the original loan amount at a fixed rate of interest for a given term. The level payments were comprised of principal and the interest on the outstanding loan amount. For example, a 20 year loan of Rs 100000 carrying a contract rate of interest of 12% would be amortized in the following manner. In Table 3.2 the monthly payment (equated monthly installment or EMI) is shown using the standard formula for present value.\footnote{PV = A \sum \left( \frac{1}{1 + \frac{i}{12}} \right)^n}$

Where, $PV =$ Present Value (loan amount), $A =$ annuity or constant payment, $i =$ fixed interest rate on mortgage, $n =$ number of months the loan will remain outstanding.

The formulas for PMT, IPMT and PPMT from the standard excel package may also be used to derive the equated monthly installment (EMI), the interest portion of any specific installment or the principal payment of the same.
### Table 3.2: Amortization Schedule (Constant Payment Mortgage Loan)

<table>
<thead>
<tr>
<th>Month</th>
<th>Opening Balance</th>
<th>Interest</th>
<th>Amortization</th>
<th>Monthly payment</th>
<th>Closing Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100,000.00</td>
<td>1,000.00</td>
<td>101.09</td>
<td>1,101.09</td>
<td>99,898.91</td>
</tr>
<tr>
<td>2</td>
<td>99,898.91</td>
<td>989.99</td>
<td>102.10</td>
<td>1,101.09</td>
<td>98,899.92</td>
</tr>
<tr>
<td>3</td>
<td>98,899.92</td>
<td>989.00</td>
<td>112.09</td>
<td>1,101.09</td>
<td>97,910.92</td>
</tr>
<tr>
<td>4</td>
<td>97,910.92</td>
<td>979.11</td>
<td>121.98</td>
<td>1,101.09</td>
<td>96,931.81</td>
</tr>
<tr>
<td>5</td>
<td>96,931.81</td>
<td>969.32</td>
<td>131.77</td>
<td>1,101.09</td>
<td>95,962.49</td>
</tr>
<tr>
<td>6</td>
<td>95,962.49</td>
<td>959.62</td>
<td>141.46</td>
<td>1,101.09</td>
<td>95,002.87</td>
</tr>
<tr>
<td>7</td>
<td>95,002.87</td>
<td>950.03</td>
<td>151.06</td>
<td>1,101.09</td>
<td>94,052.84</td>
</tr>
<tr>
<td>100</td>
<td></td>
<td>830.37</td>
<td>270.72</td>
<td>1,101.09</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td></td>
<td>655.86</td>
<td>445.23</td>
<td>1,101.09</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
<td>368.86</td>
<td>732.23</td>
<td>1,101.09</td>
<td></td>
</tr>
<tr>
<td>240</td>
<td></td>
<td>10.90</td>
<td>1,090.19</td>
<td>1,101.09</td>
<td></td>
</tr>
</tbody>
</table>

The EMI is consisted of monthly interest charge and is calculated on the outstanding balance of the previous month and amortization of the principal. While the interest component is more (Rs 1000, Rs 989 and Rs 950.03 in the first, third and seventh month respectively) the amortization of principal is slow during the initial years (Rs 101.09, Rs 112.09 and Rs 151.06 in the first, third and seventh month respectively). The pace of amortization increases during the later years (Rs 270.72, Rs 445.23, Rs 732.23 and Rs 1090.19 in the 100th, 150th, 200th and 240th installments respectively). This can be represented in Figure 3.3.
- **Partially Amortizing Constant Payment Mortgage.**

  In the previous case the loan was fully amortized over the tenure of the loan. A variation to this type is the 'balloon payment' mortgage which has non-zero outstanding balance on maturity date. This is done in order to reduce the burden of the EMI in the hands of the borrower. Since the loan is not fully amortized at maturity the EMI is comparatively lower and ends with lump sum payment at maturity.

- **Zero Amortization or 'Interest only' Loans.**

  In this particular system, the principal is payable at maturity and the monthly payment is consists of the interest (Rs 100000 \(\times\) 12\% \(\times\) 1 \(\div\) 12 = Rs 1000) only. These are also called 'interest only' loans.

- **Increasing Loan Balances or Negative Amortization.**

  In this system, EMI payment is such that it covers less than the interest portion of the loan resulting negative amortization and thus the future value of the loan increases beyond the initial loan amount. This is an innovation to give the benefit of lower EMI in the initial years to the borrower. The Graduated Payment Mortgage (GPM) was developed on this concept to mitigate the 'tilt' effect in inflationary conditions. The series of
mortgage payment under the GPM are lower in the initial years and increases in future when the income of the borrower also increases.

• **Reverse Annuity Mortgages (RAM).**

As the name suggests the RAM is the opposite of the mortgage loans discussed above. This is a method to release the huge wealth locked in home-ownership. For example, the household which owns a residential property worth Rs 600000 may wish to generate some cash flow from mortgaging the property. In such a situation the RAM may be a good option for the homeowner. In this case a financial institution may allow a loan to the home-owner against the mortgage of the house. In our example the financial institution allows a loan of Rs 360000 (60% of the Value) at 10% rate of interest. In most cases the loan is paid in monthly installments which supplement the retirement income of the homeowner.

• **Variable Rate Mortgages (Adjustable Rate Mortgages).**

All the mortgages discussed above originated with fixed interest rates and predeterminded payment patterns. This poised problems for the lenders as the interest rate increased during times of inflation. The deposits were generally short term and thus had to be serviced at the enhanced rate while the funds were being blocked at long term mortgages which were at lower rate of interest. To overcome this problem of asset-liability mismatch a mortgage instrument was developed with variable coupon rate of interest. In 1978, a state chartered saving and loan association in California introduced the variable rate mortgage and in 1982 the Federal Home Loan Bank Board (FLBB) adopted this instrument. This instrument differed from fixed rate mortgages (FRMs) as they were designed to adjust to changes in economic conditions. The lenders and the borrowers shared the risk of fluctuation of interest rate. The payments (EMI) of these loans are initially pegged to a *coupon rate* (linked to the base rate or the prime lending rate). This
coupon rate is adjusted on adjustment dates as per some predetermined index, which is often the base rate or the prime lending rate plus/minus a margin. Thus, the mortgage interest rate varies as the central bank revise the base rate or the prime lending rate from time to time. Every time the mortgage interest rate varies, the amortization schedule is restructured (only on the adjustment dates). Caps (upper limit) and floors (lower limit) are incorporated within which the EMI is allowed to fluctuate. When the change in coupon rate is not captured through the change in EMI because of the caps and floors, the tenure of the loan is increased or decreased accordingly. For example, the initial EMI for an amount of Rs 100,000, 20 year 10% mortgage loan is Rs 965.02. If the central bank increases the prime lending rate such that the coupon rate increases to 12% and the adjustment interval is one year then the mortgage would be restructured on the adjustment date (one year hence). After one year the outstanding loan balance would be Rs 87,873.98. The amortization schedule would be restructured (interest rate of 12%) and the EMI for the second year would be Rs 980.13.

A portion of the interest rate risk lies with the lender as he can restructure the loan only on the adjustment dates. Thus, when the interest increases immediately after an adjustment date he would incur loss till the next adjustment date when he would be able to restructure the EMI or the tenure as the case may be to shift the burden of enhanced interest rate on the borrower. Thus, longer the adjustment interval, greater is the interest rate risk to the lender. Since the lender shifts substantial portion of the interest rate risk to the borrower the initial interest rate (coupon rate) on an ARM should generally be less than that on a FRM as the initial interest rate would consist of lower risk premium for the lender.

5 Basic calculator solution n = 240 months PV = 100,000, i = .10/12, PMT = Rs 965.02.
6 Basic calculator solution, n = 12, i = .10/12, FV = 121,26.02. Therefore the outstanding balance = 100,000 - 121,26.02
7 Basic calculator solution n = 228 months PV = 87,873.98, i = .12/12, PMT = Rs 980.13.
- *The Price Level Adjusted Mortgage (PLAM).*

Expected real interest rate ($r$), risk premium ($p$) and premium for expected inflation ($f$) are the components of the mortgage interest rate, $i$. For countries with high inflation estimation of this third component (expected inflation, $f$) poses serious difficulty. In order to reduce the interest rate risk or the uncertainty of inflation and its effects on interest rates, the PLAM was developed in which the mortgage interest rate was devoid of the premium for expected inflation ($f$). Thus, the initial mortgage interest rate comprised of $r$ and $p$ (for default risk) is much lower. The outstanding loan balance is adjusted for inflation (on adjustment date) and the EMI is re-fixed on the inflation adjusted outstanding loan balance for the ensuing adjustment interval period. Thus, the interest rate risk (due to inflation) would be shifted to the borrower and the lender would not have to estimate the inflation for computing the premium for expected inflation. For example, the initial EMI on a 4% mortgage loan (20 years) for Rs 100000 is Rs 605.98. At the year end the outstanding loan balance is Rs 92,593.43. This outstanding loan balance shall be adjusted to an index (pre-decided by the lender and the borrower). In most cases the consumer price index (CPI) is considered as the relevant index. If the CPI increased by 15% during the adjustment interval (one year) then the adjusted outstanding loan balance would become Rs 106482.45 ($92,593.43 \times 1.15$). Under such a situation the loan amortization schedule would have to be restructured and the new EMI (Rs 667.51) would be applicable for the next adjustment interval (one year). The new EMI would be applicable for the next adjustment interval and on the next adjustment date a similar exercise would be

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8 The initial coupon rate would be lower as it does not incorporate the premium for unexpected changes in inflation.
9 Basic calculator solution $n = 240$ months $PV = 100000, i = .04/12, PMT = Rs 605.98$.
10 Basic Calculator Solution, $n = 12, i = .04/12$, $FV = 7406.57$. Therefore the outstanding balance = 100000 - 7406.57
11 Basic calculator solution $n = 228$ months $PV = 106482.45, i = .04/12$, $PMT = Rs 667.51$
12 Outstanding loan balance would be multiplied by the CPI to arrive at the adjusted outstanding loan balance
undertaken. If it is assumed that the inflation rate remains constant at 15% (reflected in the CPI) then the monthly payments would increase consistently and the outstanding mortgage balance would increase beyond the contract amount in the initial years but would decrease more steeply in the later years. In Figure: 3.4 the monthly payments and the outstanding mortgage balance of the PLAM is shown and a comparison is drawn with that of the constant payment mortgage discussed earlier.

**Fig 3.4: The Price Level Adjusted Mortgage (PLAM) and CPM**

<table>
<thead>
<tr>
<th>Monthly Payments</th>
<th>Outstanding Balance</th>
</tr>
</thead>
</table>

The Mortgage Process

In the previous section the various types of mortgage loans have been discussed. This section deals with some issues related to the mortgage process. The mortgage process begins with the application for loan of the borrower. The proposal is processed on the basis of the financial consideration (appraisal of the borrower), technical consideration (appraisal of the property), and legal consideration (appraisal of legal title to the property). In financial appraisal the borrower's financial credibility is assessed. This is done to make an assessment of the default risk involved with the loan. Loan eligibility is also an important issue. It is determined on the basis of the repaying capacity of the borrower.
Various ratios are used to calculate the repaying capacity. There are basically two kinds of housing ratio used in the mortgage lending process, the value to income ratio and the payment to income ratio. The value to income is the ratio between the value of the house financed and the income (after adjustment of all financial obligations) of the individual. Given the income of the individual, this ratio would give an estimation of the value of the house proposed to be purchased. Extensive use of this ratio is found in the USA where the home buyers are advised to buy homes not exceeding two to two and half times the annual income of the individual. The payment to income ratio, also called the mortgage payment to income ratio, is the ratio between the monthly repayment of the loan and the income (after adjustment of all financial obligations) of the individual. The rule of thumb is that the households should pay not more than 25% of their adjusted income (gross take home pay less all financial obligations). This rule evolved from the late 19th century concept of “a week’s pay for a month’s rent” The mortgage lenders of USA used a 30% payment to income ratio, which was based on the home loan repayment pattern during that period, for more than 50 years. During 1980s, higher consumer expenditures for housing provided a rationale of using higher payment to income ratio.

The loan to value ratio (LTV), fixed obligations to income (FOIR) and some derivatives of these ratios, are used by the financial institutions to calculate the eligibility of home loans of the individuals. While, LTV is used to calculate the loan eligibility on the basis of the value of the property, FOIR is used to calculate the eligibility on the basis of the repayment capacity of the individual. For example, an 85% LTV implies that the home buyer is eligible for 85% of the value of the property as home loan. A 25% FOIR implies that the individual can set aside 25% of his adjusted gross take home pay for fixed obligation of repayment of home loan. For example, if the gross adjusted take home pay of an individual is Rs 20000, then Rs 5000 (25% of Rs 20000) is considered as the repayment
capacity of the borrower as regards to the monthly obligation towards housing loan installment. On the basis of this installment payment the loan eligibility is calculated. If the equated monthly installment of Rs 100000 (loan) is Rs 1000 (at a given coupon interest rate) then the borrower would qualify for Rs 500000 (as he can pay Rs 5000 every month towards his housing loan). The housing finance institutions along with their agents often use higher ratios to increase the financial eligibility of the borrower as that helps them increase their business of housing finance though this practice increases the risk of default.

Construction of a property requires the approval of proper authority for ensuring the quality of the housing stock and the neighbourhood. In technical analysis the financial institution has to satisfy itself that the norms of the relevant authority are abided by.

If the financial and technical aspects are cleared, legal appraisal of the loan is undertaken. This is done for creating the most suitable mortgage. For example, in India under the Transfer of Property Act several forms of mortgage are valid in law but the least expensive is the creation of equitable mortgage by way of deposit of title deeds (Section 58A of the Transfer of Property Act). For this purpose title deeds need to be free from any encumbrances. Legal appraisal would entail an assessment of the title deeds of the property involved.

‘Stages’ of Development of Housing Finance System

More than 180 advanced and developing countries are listed as beneficiaries of the World Bank as a consequence of the phase two policies (discussed in chapter 2) formulated by the Bank. In developing countries the cities are growing rapidly, poverty is threatening and there is tremendous dearth of financial resources. In these countries financing of social housing should be a part of the overall housing finance system for countering the rapid urbanization problems.
Development and maintenance of a safe and sound housing finance system is of primary concern to the governments. Effective formulation of housing finance system depends on the interaction of three sets of complex factors viz. the macroeconomic and financial policies, financial infrastructure and urban laws, policies and practices. The constitutive elements of each of them are as follows

1. Macroeconomic and world economy are comprised of
   a) integration with world economy,
   b) exchange rate policy,
   c) interest rate and credit policy and
   d) associated level of domestic price stability.

2. Financial infrastructure includes
   a) laws,
   b) accounting systems,
   c) regulation and supervision and
   d) payment systems.

3. Urban laws, policies and practices consider
   a) clarity of ownership and enforceable property rights,
   b) economically sound, market sensitive urban planning,
   c) predictable land development codes and practices and
   d) local taxation policy in housing and Real estate.

Amongst the above three the policy makers often pay least attention to financial infrastructure which is most related to the housing finance system of a country. Owing to variations in the listed factors the development of housing finance system differs significantly across countries. Accordingly, we find that the housing finance system, in
some countries, barely exist while in other countries it is deeply imbedded and integrated to the broader financial market.

It has been observed that the housing finance system of different countries varies considerably depending on the above three complex set of factors. Accordingly, six categories of housing finance systems have been noted (Renaud, 1999). These six categories do not necessarily follow a sequence. The categorization has been made on the basis of the size of the housing finance system in comparison to the economy. Average size of a country’s outstanding mortgage portfolios and the ratio of annual mortgage loan origination to GDP form the basis of categorization of the housing finance system. The six categories of housing finance systems which may also be called ‘stages of development’ are discussed below:

- **Undeveloped housing finance system**

  In this type of housing finance system the outstanding mortgage portfolio is 6% (approximately) of the GDP and new mortgage loan origination is almost absent. These housing finance systems are found at very early stage of economic development. These systems are dominant in the poor countries of Africa where per capita income is very low along with immense poverty and massive unemployment. The housing finance system fails to develop due to poor financial infrastructure and absence of urban laws, policies and practices. The basic institutions of the financial system are barely at place. The commercial banks often fail in functioning as financial intermediaries. Since the core financial institution i.e. commercial banks are poorly developed the overall financial structure is not trustworthy and thus housing finance system remains unstructured. Inadequate information system and primitive methods of operation add to the high operating costs. Proper government intervention in policy formulation, refinancing and urban development is also
Informal finance is dominant, accounting for almost 95% of the financial flow in the housing sector.

- **Missing housing finance system (in former centrally planned economies)**

  In the transition economies (economies emerging from central planning to market based economies) of the former Soviet Union, Central and Eastern Europe, China and Vietnam, an efficient housing finance system was totally missing as their housing policies treated housing exclusively as a social issue to be met by the state. Thus, financing of social housing along with site development programmes, squatter settlements and slum upgradation were prevalent in these countries and market based financial intermediation was absent. However, considerable progress was made in some of these countries since 1990 with major changes in the political scenario. However, the countries faced major challenges as they tried to build a market based system.

  Previously, private property rights were not properly defined and as a result financing of social housing took the form of housing subsidies which is not recommended in market economy. Rent and legal reforms along with regulatory reforms of the banking sector were absent during the previous regime and thus the macroeconomic and financial policies were not congenial to housing finance. After 1989, these countries faced serious problems when were trying to develop a viable housing finance system. Countries like Poland and Hungary showed significant development in housing finance after decade long reform activities. In general, private housing finance remains limited, experimental and is meant exclusively for high income groups. Co-ordinated improvement of primary mortgage lenders and the development of secondary market facilities are needed for the development of these housing finance systems (Jaffee and Renaud, 1997).
• **Fragmented and unstable housing finance systems**

Some countries of the world are characterized with high inflation along with financial and macroeconomic instability. Countries in Latin America are examples of this type. Due to high inflation, the real interest rates are high, which is devastating for all types of long term finance including housing finance. Effective housing finance system depends primarily on long-term stability of interest rate and galloping inflation is a mortal enemy for the interest rate. The countries are also featured with severe income inequality and this, along with poverty, results in unaffordability (of the borrowers) in mortgage finance. Housing finance has become serious victim to the socio-economic condition of such countries. The government should intervene in such a situation to improve the socio economic condition by providing housing subsidies to the economically disadvantaged. In these countries housing finance systems are small, compared to the urban economy and are fragmented and distorted. High rate of inflation raises the cost of living and gives rise to financial crises as observed in Argentina, Brazil and other Latin American countries during the 1980s. In these countries housing subsidies must be segregated from housing finance and should be directed towards social housing. Along with this, financial environment must be bettered and inflation must be controlled for the development of housing finance system.

• **Segregated but stable housing finance systems**

In some of the developing countries especially in East Asia including India and in Middle East, housing has been included in the *priority sector*. These countries have done relatively well in managing their macroeconomic policies. The financial sector is not considered as an autonomous sector and is not allowed to run privately. Rather, the financial system is used as an instrument of the state plan to direct resources to the priority sectors. In the financial sector we find dominance of government securities and there is a
poorly developed bond market. The housing finance system is stable and is centered on a limited number of housing finance institutions. Administered interest rates (by the government) coupled with stringent rules and regulations (of the government) makes the task of these institutions difficult. Housing subsidies including cross subsidization of housing loans and preferential housing loans are some of the dominant features of this system. Formal financial intermediation is comparatively low which results in a significant volume of informal finance. These factors results to high implicit cost of capital in the housing sector.

- **Sound and integrating housing finance systems**

In some developing countries a sound and integrating housing finance systems is found. In Thailand and Malaysia housing loans are available to people belonging to relatively low income levels due to an efficient and effective housing finance system. In Malaysia we find a developed financial sector compared to its level of income resulting from the various reforms that were brought about in the mid 1980s.

Overall, this system is prevalent where the economies have been well integrated into world financial market, have good financial, legal, regulatory and supervisory frameworks in place and features proper external and internal macroeconomic management. However, in recent times the economy has undergone interest rate liberalization, which has led to the development of a suitable environment for secondary mortgage markets. These economies possess sufficient number of contractual savings institutions and institutional investors which favours the financial intermediation process and support the emergence of a competitive real estate industry. Secondary mortgage market based on asset securitization is also an important feature of this system. Technical innovations adopted from international markets are also important aspects of this system.
• **Advanced housing finance system**

The system is prevalent in the mature economies of European countries and USA. This system has grown out of the tradition of 'thrift' (which is basically a 19th Century Anglo-Saxon system) where building societies of the UK and the savings and loans association of the USA are considered as the basic form of housing finance institutions. The system also shares its inception from mortgage bank tradition of Continental Europe (particularly strong in northern European countries such as Denmark and Germany). In these systems a steady shift is observed, as specialized housing finance institutions has given place to general financial institutions and housing finance has developed as a specialized financial services (mortgage finance). The mortgage finance industry has become dynamic due to steady convergence of financial innovation, the digital revolution and globalization of capital markets.