An Empirical Analysis of the Demand for Home Loans in Urban India

** Archana Fulwari*
*** Jayant Kumar*

Abstract

Housing aspirations of households in India have been on a rise, particularly in the post reforms period, and the role of home loans in meeting these needs cannot be overemphasized. The entry of private financial institutions and banks in a big way after the introduction of economic reforms in India and their aggressive posturing have added further fuel to the demand for housing. The post reforms period has witnessed higher personal disposable incomes, lower inflation rates, lower interest rate regime, and an increased thrust on retail lending by the financial institutions, contributing to the expansion of the housing finance sector. The recent years, however, have witnessed a rise in interest rates and inflation, and a general slowdown of the economy, all of which appear to have impacted the housing finance sector. The present paper attempted to find out the impact of important economic factors on the households' demand for home loans for the period from 1990-1991 to 2014- 2015. The study employed regression analysis to examine the significance of income and interest rates in determining the demand for home loans in urban areas.

Keywords : **housing finance, home loan interest rates, household income**

JEL Classification: G21, R21, R31

Paper Submission Date : September 9, 2015 ; Paper sent back for Revision : March 29, 2016; Paper Acceptance Date : April 30, 2016

Housing is an important component of the socioeconomic status of any household from the poorest to the most affluent. Demand for housing is considered to be a derived demand for the services it provides like privacy, security, and comfort (Charles, 1977). Housing has been typically considered to be a basic necessity, implying that it has lower income elasticity. However, if we look at the range of amenities and luxury elements that it can encompass, housing is more of a comfort good. This implies that the demand for housing, and therefore, for housing finance, can be expected to respond to economic variables such as interest rates and income levels. The role of income in the demand for housing finance is clear from the fact that of the total household expenditure, housing claims 15% - 25% share, second only to food (Grimes, 1976).

The Indian housing finance sector has graduated from its earlier phase of government dominance to a market-based system in the recent times. In the 1990s, as the process of liberalization unfolded, it provided a great impetus to the private institutions to enter into the expanding financial sector of India. This has lent the much-needed vibrancy to the housing finance sector, resulting into lower lending rates and stiff competition among retail lenders. Furthermore, economic reforms fructified into higher personal incomes, and with the expansion of the middle class, thrust the demand for housing on to a higher gear.

* *Assistant Professor,* Department of Business Economics, Faculty of Commerce, The M. S. University of Baroda, Lok Manya Tilak Road , Sayajigunj, Vadodara - 390 002, Gujarat. E-mail : archanafulwari@gmail.com
** *Associate Professor,* Department of Business Economics, Faculty of Commerce, The M. S. University of Baroda , Lok Manya Tilak Road , Sayajigunj, Vadodara - 390 002, Gujarat. E-mail : jyntkumar@yahoo.com

Review of Literature

Economic literature on housing credit boasts of many studies that analyze the factors influencing the demand for housing and housing finance. Kearl (1979) stated that the mortgage market permits households to adjust their asset portfolio as desired, by making the housing asset divisible. However, he also emphasized on the distortions caused in the housing market by anticipated inflation as it affects down payments, maturity period of housing loans, and the risks involved in the same, particularly in the case of constant payment mortgages. He postulated demand for housing services as a function of price of the services, income, index of prices of other commodities, and household characteristics. His regression results showed a significant impact of house prices and income. The role of terms of housing finance such as loan-to-value ratios, nominal mortgage rates, and loan duration have been postulated as factors affecting the price of the housing asset. Using a simulation technique, Kearl showed that anticipated inflation influenced the terms of housing finance and thereby affected the house prices and demand.

Von Furstenberg (1969) and Herzog and Earley (1970) stated that easy credit terms such as higher loan-to-value ratio and longer maturity of housing finance improves the housing finance affordability of households. Gelfand (1966, 1970) too concluded in his studies that liberal credit terms such as lower interest rates, lower down payment requirements, and longer maturity period have favourable effects on the demand for housing. His analysis was based on data generated through simulation study of the housing markets in the lower-middle income group and on informal interviews of builders and mortgage loan officers for data on cost of construction and cost of finance.

Arcelus and Meltzer (1973), in their econometric analysis, using ordinary least squares method, reported that the demand for housing services, as against demand for new housing, is a positive function of real income measured as permanent income instead of current income. They used real consumption expenditure as a proxy for permanent income. In their analysis of the demand for new housing, using the method of two-stage least squares, the researchers found interest rates to be one of the principal determinants. Meltzer (1974) emphasized that availability of credit reduced the relative mortgage rates and eased the terms and conditions of mortgage contract, thereby affecting the demand for housing. However, in the long run context, he did not find any positive correlation between availability of credit and increase in housing assets.

In his paper, Kirby (1976) highlighted how the level and type of household income, whether regular or variable, is an important factor for lenders to discriminate between households. Rosa (1978), using portfolio model of households' holdings of assets and liabilities, reported housing demand to be highly interest elastic. Starr (1977) suggested that availability of housing for moderate and low-income borrowers could be improved by lowering of mortgage interest rates. Employing the technique of regression analysis, Kent (1980) reported that home mortgage rate was not a determinant of the demand for home-mortgage funds since its effect was captured in the user cost term. He found permanent income to have a positive effect on the demand for home mortgage funds. He also reported stronger impact of maturity period as a determinant of the demand for home mortgage funds compared to the loan-to-value ratio. Chatterjee (1982) too considered mortgage credit terms such as mortgage rates, loan size, and payment terms to have a great bearing on housing affordability of households. Her analysis was based on a housing affordability model, developed for different income groups, and examined under easy and stringent mortgage credit terms using a simulation technique.

While Kent (1980) considered permanent income to be decisive in affecting the demand for housing services, Dynarski and Sheffrin (1985) focused upon the role of transitory income in determining the ability of households to make down payments, and thereby, its bearing upon the demand for home loans. Mehta and Mehta (1991) highlighted how the absence of a regular stream of monthly income can be a factor that debars many urban poor households from availing home loans, although they are able to afford the loans at the

prevalent terms. Renaud (1996) stated that higher real rates of interest and falling real wages acted as deterrents to the demand for home loans. Khan (2003) linked poor access to housing finance for a majority of population in Pakistan to the highly prohibitive mortgage rates prevalent in the country. Ellis (2006) considered the mix of disinflation, deregulation, and financial innovation as the factors that encourage the supply of home loans; thereby, leading to increase in the demand for housing. Mahadev (2009) highlighted the urban bias of the Indian housing finance sector.

Bandopadhyay and Saha (2009), in their study on a sample of home loan accounts of housing finance institutions in India, investigated the important factors driving the demand for housing and the role of borrower characteristics influencing it. Chandrasekar and Krishnamoorthy (2010) examined the impact of housing finance variables such as home loan disbursals, interest rates, and inflation on the demand for housing for the U.S., UK, and Indian housing sector. Kumar and Fulwari (2012), in their analysis of the demand for housing finance in the state of Gujarat, reported that while in its individual capacity, the home loan interest rate had a negative impact on the demand for home loans, in conjunction with the income variable, it was not found to be a significant determinant. They also found that anticipated income of households provided better explanation for the variations in the demand for home loans in Gujarat rather than the current income levels. Another study by Fulwari (2012) found urban demand for home loans to vary negatively with the variable home loan interest rate. Sandhu (2013) highlighted the failure of the formal housing finance sector in India to reach out to the urban poor households.

Objectives of the Study and Research Methodology

In the light of the review of literature, the present study examines the role of interest rates and income levels in the demand for home loans in urban India. This study is significant, particularly, in the context of the fact that the Indian economy has witnessed a phase where these factors have been conducive to the demand for home loans on *a-priori* terms. This was followed by a phase where interest rates and income levels have displayed unfavourable trends owing to global economic slowdown and poor macroeconomic fundamentals within the country. This study aims at quantifying the effect of interest rates and income levels, if any, on the demand for home loans. The hypotheses examined are as under:

- **H1 :** Home loan interest rate has a negative impact on the demand for home loans.
- **H2 :** Income has a positive effect on the demand for home loans.

The technique of regression analysis has been used to examine the above hypotheses. The study takes into account a period of 25 years, from 1990- 1991 to 2014-15, for which data is available. The number of years is sufficient to predict the numerical impact. Since the scheduled commercial banks hold the major share of the housing finance market (more than 70% for major part of the study period) in India, the present study uses the outstanding home loans of the SCBs to semi-urban, urban, and metropolitan population to represent the demand for home loans. Outstanding home loans of rural population have been excluded from the study. The level of outstanding home loans is a combination of principal loan amount outstanding, new home loan disbursals, prepayments, balance loan transfers, and any other form of loan restructuring. By this implication, it is an expression of the preference of households to hold the housing loan liability at the existing rates of interest and income levels. Since separate data on new loan disbursals, prepayments or loan transfers is not available, the changes in outstanding home loans of SCBs are taken to suffice as the 'demand for home loans' variable. Yearly changes in the outstanding home loans of scheduled commercial banks have been computed for this purpose.

As regards the home loan interest rates, substantial segmentation has been observed on the basis of the

maturity period of loan, the quantum of loan, and the type of loan, whether on floating rate or fixed rate. It is not possible to incorporate the varied rates of interest for analysis of home loans in the aggregate form. The prime lending rates of five major public sector banks have been used as a proxy variable for the home loan interest rate.

Income is a major factor that plays a vital role in the decision to avail home loans. It is an important criterion that decides the credit worthiness of a potential borrower. The per-capita net national product (PC NNP) at constant prices has been taken as the income variable. Although the demand for home loans is taken in nominal terms, the income variable is taken in real terms as it would reflect the true affordability of households to service a home loan after discounting for their other consumption expenditures. All variables have been taken in their log forms. The study sources the data from the various publications of the Reserve Bank of India. The data has been presented in the Appendix Table 1 at the end of the paper.

Analysis and Results

The findings of the two log models examined in this study are as shown in the Table 1.

MODEL I : $D_{HL} = \alpha + \beta_1 r + \varepsilon$

The first model examines the effect of interest rates alone on the demand for home loans. The model explains more than 50% variation in the demand for home loans. The constant term has the expected positive sign indicating the maximum demand for home loans at zero rates of interest. It is statistically significant at the 1% level of significance. The beta coefficient of the interest rate variable also bears the expected negative sign and is statistically significant at 1%. The results support the first hypothesis under study that interest rates have a negative effect on the demand for home loans. The acceptance of the hypothesis is further strengthened by the positive sign of the constant term as it substantiates the negative slope coefficient of the demand for home loan equation. As the income variable is absent in the first model, the interest rate exerts much greater impact on the demand for home loans as is evident from the high interest elasticity value of seven. This is as expected as the rate of interest represents the cost of borrowing. The results also suggest that the rate of interest is insufficient to explain the total variations in the demand for home loans. This is borne out by the poor value of the D-W statistic.

MODEL II : $D_{HL} = \alpha + \beta_1 r + \beta_2 PCI + \varepsilon$

The second model examines the combined impact of interest rate and income on the dependent variable. Together, they explain 80% of variations in the demand for home loans. Both the hypotheses of the study are supported by the results. Both beta coefficients appear with the expected sign and are found to be statistically significant. Home loan interest rates are found to have a negative effect on the demand for home loans, as

Table 1. Empirical Results for the Demand for Home Loans

VARIABLE	MODEL I	MODEL II
CONSTANT	27.609*(8.301) *p* - value 0.000	-20.177** (-2.098) *p* - value 0.048
INTEREST RATE	-7.345* (-5.598) *p* - value 0.000	-3.078** (-2.513) *p* - value 0.020
INCOME (PCI)	-	3.679*(5.113) *p* - value 0.000
D-W	0.825	1.230
ADJUSTED R^2	0.569	0.801

Note : Figures in brackets are *t* values. *Significant at 1% level. **Significant at 5% level.

hypothesized. There is substantial reduction in the interest elasticity of the demand for home loans to three compared to the previous model.

The second hypothesis regarding positive effect of income on the demand for home loans is found to be true. Income is found to have a significant positive effect on the demand for home loans with high income elasticity. Interestingly, the constant term which exhibits a positive sign in the first model now bears a negative sign, which is compatible with the relatively stronger role of the income variable compared to the interest rate variable. The negative sign indicates that households can demand home loans only after their income reaches a certain critical minimum level of eligibility.

The D-W statistic has improved; however, being less than two, it suggests autocorrelation in the residuals. This is as expected because the housing finance sector is highly segmented and diverse as far as the terms of lending are concerned. These include differential treatment of home loans on fixed versus floating rates, varying maturity periods and quantum of loans, and of borrowers with regular versus variable incomes, and so forth. These aspects do not get reflected in the generic variables used in this study. Nonetheless, it establishes the fact that at the macro economic level, interest rates do exert a negative effect and income of borrowers has a positive effect on the demand for home loans, as expected on *a priori* basis.

Similar studies such as the study conducted by Bandopadhyay and Saha (2009) reported positive income elasticity of the demand for home loans in their regression results, although it was found to be less than unity. It may be noted, however, that they examined the demand for housing as against the present study which examines the demand for home loans as an intermediate variable, which exhibits greater income elasticity. This is as anticipated because higher incomes increase households' capacity to service bigger home loans. The results of the present study are in line with those observed by Chandrasekar and Krishnamoorthy (2010) for the housing finance sector of U.S. and India. They reported a significant negative impact of interest rates on the demand for housing. Their results for India are, however, based upon the sample from the city of Hyderabad. They did not find a negative relation between interest rates and demand for housing for the UK housing sector. Likewise, Fulwari (2012) also reported a significant negative impact of variable home loan interest rates and positive impact of the income variable on the demand for home loans. However, the results of a similar study by Kumar and Fulwari (2012) on housing finance in the state of Gujarat do not support the role of interest rates in influencing the demand for home loans, even as income was found to be statistically significant.

Research Implications and Policy Recommendations

The analysis clearly brings out the significant role of income and interest rates in the demand for housing finance in urban India. Since affordability factors are found to play a significant role in the demand for home loans, it also suggests that the formal housing finance system tends to cater to middle and upper-income group households. The future of the housing finance sector in India is promising due to higher proportion of population belonging to the productive age group, increasing urbanization, and increase in the number of middle-class households. For this reason, policy makers need to be proactive in creating an enabling environment for extending the reach of the housing finance sector in the desired direction. The high degree of interest elasticity of the demand for home loans implies that adopting a policy of moderate home loan interest rates would enable many more households to meet their demand for housing. This is particularly important in the light of the immense favourable effects of home ownership. The significance of the policy of cheap credit can be gauged from the fact that the interest elasticity of the demand for home loans is high even in the presence of the income variable.

Empirical results show a reduction in interest elasticity of home loans in the presence of income variable. That is, borrowers with higher income are less sensitive to interest rates. Therefore, lowering of home loan

interest rates can be an effective policy tool for increasing the demand for home finance, particularly when targeted towards low-income households. It is recommended that interest rate subsidies be linked to the income class of the borrowers. Along with income linked interest rate subsidy scheme, more liberal credit terms need to be applied, especially to borrowers belonging to lower income classes.

Given the high-income elasticity of the demand for home loans, there is a strong case for continuation of tax incentives on home loans extended under the Section 80C. There is, however, a need to re-think on the social merit of tax incentives on loans for second homes as it encourages a speculative purchase of housing, fuels residential property prices, and draws more housing developers to cater to the high-end market at the neglect of low and moderate income housing. In the light of this, tax incentives can be made more equitable by introducing a scheme of incentives that favours lower income households and is focused on first-time home buyers.

Conclusion

The post reforms period in India has witnessed a substantial rise in the housing aspirations of households, and housing finance has played a significant role in this regard. The present paper validates the significance of key variables in the demand for housing finance, namely, interest rates and income. The entry of private financial institutions and banks in India in a big way after the introduction of economic reforms, their increased thrust on retail lending, and their aggressive posturing resulted into a regime of low interest rates. Lower rates of interest on home loans have definitely boosted the demand for housing finance. The post reforms period also witnessed higher personal disposable incomes, and combined with favourable tax incentives on housing loans, have contributed towards the expansion of the housing finance sector. RBI data on housing finance bears witness to the considerable increase not only in the level of outstanding home loans, but also in the number of home loan accounts and in the volume of bigger home loans, all of which further underlines the importance of interest rates and income as determinants of the demand for home loans. The general economic slowdown, globally and domestically, in the latter years of the decade of 2000 are also reflected in the sluggishness of the housing finance sector over the same period, adding robustness to the results obtained in the present study. Despite the generic nature of the data, the analysis has been able to capture the factors underlying the housing finance sector, and sets the base for a more in - depth analysis.

Limitations of the Study and Scope for Further Research

The findings of the study need to be interpreted in the context of the limitations of the aggregative nature of the time-series data and the research methodology employed. The generic nature of the variables limits the extent to which the finer aspects of housing finance can be elicited and construed. Several areas of inquiry such as the demand behaviour of borrowers with respect to non-interest rate terms and conditions of credit, the demand behaviour of borrowers in relation to fixed versus adjustable-rate mortgages, prepayment behaviour of borrowers, and so forth reveal the peculiarities of the demand behaviour for housing finance. However, on account of lack of disaggregate data at the macro economy level, the present study has not been able to incorporate such inquiries within its scope.

With suitable research methodology such as case studies and the use of micro level data, the results of the present study can be put to further test. The present study lays the foundation for a more detailed examination of the demand for home loans such as borrower sensitivity to the various terms and conditions of home loans. It opens up scope for further research at more disaggregate and specific levels for a sharper focus on the intricacies of the working of the demand side of the housing finance sector. With suitable research methodology such as case studies and the use of micro level data, the results of the present study can be put to further test.

References

Arcelus, F., & Meltzer, A. H. (1973). The markets for housing and housing services. *Journal of Money, Credit and Banking, 5* (1), 78-99.

Bandopadhyay, A., & Saha, A. (2009). Factors driving demand and default risk in residential housing loans : Indian evidence (MRPA Paper No.14352). Retrieved from http://mpra.ub.uni-muenchen.de/14352/

Chandrasekar, V., & Krishnamoorthy, K. (2010). *Housing finance and housing – A view from India and beyond. ISB Indu Centre for Real Estate and Infrastructure* (Working Proposal). Retrieved from http://fiduciary.in/pmc/files/technical/Housingandhousingfinance-theviewfromIndia(Repaired).pdf

Charles, S. (1977). *Housing economics.* London : Macmillan Studies in Economics, London, Macmillan.

Chatterjee, L. R. (1982). Effective targeting for basic shelter provision. *Economic Geography, 58* (1), 62-74. DOI: 10.2307/143620

Dynarski, M., & Sheffrin S. M. (1985). Housing purchases and transitory income: A study with panel data. *The Review of Economics and Statistics, 67*(2), 195-204.

Ellis, L. (2006). *Housing and housing finance: The view from Australia and beyond* (Research Discussion Paper). Retrieved from http://www.rba.gov.au/publications/rdp/2006/pdf/rdp2006-12.pdf

Fulwari, A. (2012) Demand for housing finance in urban India: An empirical analysis. *IFRSA Business Review, 2*(1), 91-97.

Gelfand, J. E. (1966). The credit elasticity of lower-middle income housing demand. *Land Economics, 42*(4), 464-472.

Gelfand, J. E. (1970). Mortgage credit and lower-middle income housing demand. *Land Economics, 46* (2), 163-170.

Grimes, O. (1976). *Housing for low-income urban families : Economics and policy in the developing world.* Baltimore : The Johns Hopkins University Press.

Herzog, J. P. & Earley, J. S. (1970). *Home mortgage delinquency and foreclosure.* New York : National Bureau of Economic Research.

Kearl, J. R. (1979). Inflation, mortgage, and housing. *The Journal of Political Economy, 87* (5), Part 1, 1115-1138.

Kent, R. J. (1980). Credit rationing and the home mortgage market. *Journal of Money, Credit and Banking, 12* (3), 488-501.

Khan, M. A. (2003). Role of banks in housing finance. *Journal of the Institute of Bankers Pakistan, 71*(1), 43-73.

Kirby, A. M. (1976) Housing market studies: A critical review. In, *Transactions of the Institute of British Geographers, New Series, 1*(1), 2 - 9. DOI : http://doi.org/10.2307/621308

Kumar, J., & Fulwari, A. (2012). Housing finance in Gujarat in the post reforms period. In, *Gujarat economy: Retrospect and prospect: Proceedings of a National Seminar* held in Vadodara, India, 20-21 January, 2012 (pp. 39-48). Planning Commission's Centre for Planning and Development, Department of Economics, Faculty of Arts, The M. S. University of Baroda.

Mahadev, M. (2009). Challenges of a sustainable housing finance system in India. *The Journal of Applied Economic Research, 3* (1), 41-61.

Mehta, M., & Mehta, D. (1991). Housing finance system and urban poor. *Economic and Political Weekly, 26* (17), 1107-1114.

Meltzer, A. H. (1974). Credit availability and economic decisions: Some evidence from the mortgage and housing markets. *Journal of Finance, 29* (3), 763- 777. DOI: 10.1111/j.1540-6261.1974.tb01482.x

Renaud, B. M. (1996). *Housing finance in transition economies: The early years in Eastern Europe and the former Soviet Union* (World Bank Staff Working Paper No. 1565). Retrieved from http://wwwwds.worldbank.org/servlet/WDSContentServer/WDSP/IB/1996/01/01/000009265_3961019171837/Rendered/PDF/multi0page.pdf

Reserve Bank of India. (2015). *Handbook of statistics on Indian economy (2014 - 15).* Retrieved from https://rbi.org.in/Scripts/AnnualPublications.aspx?head=Handbook%20of%20Statistics%20on%20Indian%20Economy

Reserve Bank of India. (Various Years). *Basic statistical returns of scheduled commercial banks in India* (Various issues). Retrieved from https://rbi.org.in/Scripts/Publications.aspx?publication=Annual

Rosa, P. D. (1978). Mortgage rationing and residential investment : Some results from a Brainard-Tobin model. *Journal of Money, Credit and Banking, 10* (1), 75-87.

Sandhu, K. (2013). Formal housing finance outreach and urban poor in India. *International Journal of Housing Markets and Analysis, 6* (3),269- 283. DOI : http://dx.doi.org/10.1108/IJHMA-08-2012-0040

Starr, R. (1977). Housing and money market. *Journal of Money, Credit and Banking, 9* (4), 691-693.

Von Furstenberg, G. M. (1969). Default Risk on FHA-insured home mortgages as a function of the terms of financing : A quantitative analysis. *Journal of Finance, 24* (3), 459- 477. DOI: 10.2307/2325346

Appendix Table 1

POPULATION GROUP-WISE LOANS FOR HOUSING (₹ Millions)						
YEAR	**RURAL**	**SEMI-URBAN**	**URBAN**	**METRO-POLITAN**	**PC NNP at constant prices**	**PLR (%)**
1990-91	4207.1	6467.8	10894.4	11403.3	14330	16
1991-92	4644.5	8019.7	13313.6	14343.1	14157	19
1992-93	5381.9	9642.1	16195.5	19244.1	14643	17
1993-94	5630	10492.1	17862.9	19879.1	15181	14
1994-95	6462.2	13580.1	17648.1	21129.8	15835	15
1995-96	8118.5	15657.7	21081.7	26278.1	16675	16.5
1996-97	9565.9	17252.3	25474.1	27167.5	17714	14.50-15.00
1997-98	11853	21971	29783	32708	18103	14
1998-99	13604	28700	40210	41253	18934	12.00-13.00
1999-00	19070	41458	55817	68904	20079	12.00-12.50
2000-01	25338	55062	74259	99466	20418	11.00- 12.00
2001-02	31599	66942	97904	131814	21093	11.00- 12.00
2002-03	53868	95704	141647	199452	21578	10.75-11.50
2003-04	77121	137110	230731	408503	22985	10.25-11.00
2004-05	130242	192850	345067	599811	24143	10.25-11.00
2005-06	182134	239286	458296	941957	26015	10.25-12.75
2006-07	200232	283643	558587	1246771	28067	12.25-14.75
2007-08	275022	323380	654564	1231383	30332	12.25-15.75
2008-09	202886.6	402764.8	760484.8	1481372.9	31754	11.50-16.75
2009-10	250989.3	484661.1	840645.6	1486770.8	33901	11.00-15.75
2010-11	257771.1	554070.8	962205.6	1685264.4	36202	8.25-9.50
2011-12	253538.6	603634	1019677.5	1910585.1	38048	10.00-10.75
2012-13	290900.8	768770.2	1240452.5	2346988.3	38856	9.70-10.25
2013-14	341342.1	804666.8	1427350.6	2732695.2	39904	10.00-10.25
2014-15	43156.28	96829.08	176489.49	323404.22	-	10.00-10.25

Sources : Reserve Bank of India (2015) and Reserve Bank of India (Various Years)