

Influence of Demographic Determinants on Reverse Mortgage Willingness : An Empirical Study from India

* *Sarita Gupta*
** *Sanjay Kumar*

Abstract

The present study surveyed Indian elderly homeowners to assess their willingness for National Housing Bank's (NHB) scheme : Reverse Mortgage (RM). The prominent purpose to carry out the research was to analyze various demographic factors which contribute or hinder the potential demand of RM. Binary logistic regression was applied to analyze primary data of 410 elderly respondents. The results of the study indicated that : to be older, childless, living alone or only with spouse in home, resident of metro, ill health, and longer life expectancy were the key demographic variables that significantly and positively influenced the demand of RM. Gender, marital status, and education were found to be positive but insignificant, while awareness, though insignificant, was ascertained to be negatively related with the willingness to use RM. The results of the study recommended that mere introduction of RM in a portfolio of pension products is not sufficient. Demand for RM could be boosted by enhancing product attractiveness and by combining it with promotion of ground level awareness and counseling of possible beneficiaries to eliminate doubt and complexity attached with the product. If RM is properly implemented, then housing wealth of Indian "cash poor, home rich" elderly may be unlocked as a possible instrument to tackle the challenges of aging.

Keywords: Aging, "cash poor, home rich", demographic factors, elderly homeowner, housing wealth, reverse mortgage

JEL Classification : D10, D14, G2, R32

Paper Submission Date : December 13, 2017 ; **Paper sent back for Revision :** March 14, 2018 ; **Paper Acceptance Date :** April 26, 2018

The 21st century world is experiencing a noteworthy transition that is population aging, a function of declining fertility, falling mortality, and rising longevity that is a result of improved health care. Globally, the number of people aged 60+ reached 901 million in 2015 in comparison to 607 million in 2000, which is a noticeable increase of 48% (United Nations, 2015). Worldly, the percentage of aged people is projected to reach 21.1% by 2050 from 11.7% in 2013 and 9.2% in 1990 (United Nations, 2013). The world is graying/aging and India is no longer removed from this remarkable demographic passage. Now, India is not only the world's second most populous nation having 1.21 billion people, but it is also a graying nation. The norms laid down by UN defines a country graying when the share of elderly people aged 65+ years is 7 % in the total population

Table 1. Percentile Share of Aged Population (60+) in India

Year	1951	1961	1971	1981	1991	2001	2011
%	5.5	5.6	6.0	6.4	6.7	7.4	8.6

Source: RGI (2011)

* *Senior Research Fellow*, Department of Management, Central University of Rajasthan, Bandarsindari, Ajmer - 305 817, Rajasthan. E-mail : srtgupta88@gmail.com

** *Assistant Professor*, Department of Management, Central University of Rajasthan, Bandarsindari, Ajmer - 305 817, Rajasthan. E-mail : sanjaygarg@curaj.ac.in

proportion (Hirayama, 2010). The Table 1 depicts that India has surpassed this share - from 7.4% in 2001 to 8.6% in 2011 and this figure will increase to 12.5% in 2025 (RGI, 2011).

Around the globe, the elderly are adversely affected with a common rigor, that is, inadequate funds for later life. It is a top dog worry among all nations that how will the elderly deal with irregular and meager flow of funds in the post retirement stage. Advanced urbanization, breaking down of the joint family system, melting down of feelings of respect for the elderly (Srivastava & Mohanty, 2012) coupled with pathetic social security system and mass unorganized working sector have led to a diehard need to deal with issues pertaining to aging. The peculiar difficulty with elderly people is they are “cash poor, home rich” (Costa - Font, Gil, & Mascarilla, 2010 ; Ong, 2009). Worldwide housing wealth, which is in illiquid form, represents a major chunk of wealth portfolio of aged people (Brownfield, 2014 ; Gupta & Kumar, 2017b). Financial innovations have added a sophisticated financial product : reverse mortgage loan (RM) to unlock the wealth blocked in housing property.

Incepted from Western culture in 1981, reverse mortgage (RM) permits elderly homeowners to liquidate equity invested in their homes into regular and monthly fixed income stream without moving away from home & without the burden of repayment of loan by them or their kin (Davidoff, 2010 ; Gupta & Kumar, 2017a). It is a loan completely inverse from traditional mortgage, in which banker makes payment to borrower despite of receiving payment installments (Gupta & Kumar, 2017a). Loan repayment becomes due after the death of the borrower, or permanent move by elderly. Defrayal is made by selling the home and if the sale proceeds are more than total due, it is disbursed among legal heirs of borrower or if the proceeds are less, banker will be liable itself, so due to non recourse nature of RM, banker can't claim shortfall amount from borrower and his/her legal heirs (Costa - Font et al., 2010). Following other nations like USA, Canada, Denmark, Japan, Singapore, France, UK, Australia, Italy, and Finland, etc., GOI introduced RM in Indian market in 2007 by then Finance Minister, P. Chidambaram as a cornerstone in direction of elderly welfare under the supervision of National Housing Bank (Kaur Brar, 2011). To further meet the expectations of senior citizens, NHB introduced a new variant of this product named as “Reverse Mortgage Loan Enabled Annuity” in 2009 (Jaishankar, 2010).

Despite of the large potential of RM in the Indian market, it has not acquired the expected take off (Gupta & Kumar, 2017b). Actual growth of RM in India does not support the life cycle hypothesis propounded by Ando and Modigliani (Davidoff, Gerhard, & Post, 2017) which proposed that in later life, elderly will deplete their assets eventually. It would be very interesting from the outlook of policy makers and banking & insurance sectors to understand what are the key demographic factors which influence demand of RM in India.

Literature Review

Although RM is novice for the Indian society, but in Western, European, and other societies, there are plenty of research studies which have investigated a number of key socio demographic determinants, which influence demand of reverse mortgage.

(i) Age : Several researchers found out age to be a significant and positive predictor of home-equity conversion (Chou, Chow, & Chi, 2006 ; Chatterjee, 2016). Contrary to the above studies, Fornero, Rossi, and Brancati (2016) and Rauterkus, Munchus, and Slawson Jr. (2009) envisioned age to be negatively correlated with willingness to use RM.

(ii) Gender : Studies conducted in gauging potential demand of RM extensively looked at gender as a key predictor. Results of various studies were not consistent with this variable too. Chatterjee (2016) and Dillingh, Prast, Rossi, and Brancati (2017) reported that men were more willing to use home equity in later life. On the other side, studies conducted by Ong (2008) and Fornero et al. (2016) depicted that women were more willing to take products like RM.

(iii) Education Status : Elderly who had higher education or college degree were more willing to take participation in RM market as observed in studies (Chatterjee, 2016 ; Chou et al., 2006 ; Lee, 2005). Likewise, earlier studies (like, Inkmann, Lopes, & Michaelides, 2011) discovered a significant positive relationship between level of education and wealth annuitization decisions. Contrary to earlier studies, some authors (Davidoff et al., 2017 ; Duca & Kumar, 2014 ; Fornero et al., 2016; Lusardi & Mitchell, 2007) observed a negative relationship between financial literacy as a proxy of education and willingness for RM.

(iv) Marital Status : Studies conducted by Ong (2008) and Fornero et al. (2016) reported that being single, widowed, or divorced was positively related to the willingness to take RM as it enhances the probability to take risks as responsibility is lower. Brown, Kling, Mullainathan, and Wrobel (2008) and Inkmann et al. (2011) discovered that married people were less willing than singles for wealth annuitization decisions to secure last years.

(v) Living Arrangement : As a proxy of family size, living arrangement has been studied extensively. Gupta and Kumar (2016) found a negative relationship between large household size, proximity to children, and willingness to consume housing wealth. Rauterkus et al. (2009) found no significant relationship between home equity conversion desire and number of people residing in elderly family. On the other side, Salandro and Harrison (1997) found a significant positive relationship between large family size and home equity conversion loan. The study conducted by Case and Schnare (1994) enlightened the fact that living alone was positively associated with interest in RM.

(vi) Child Status : Absence of children was found to be positively related to the willingness to consider RM in the studies of Chou et al. (2006). Similar to these results, Chiuri and Jappelli (2010), Fornero et al. (2016), and Dillingh et al. (2017) discovered that having a number of children was negatively associated with home equity conversion schemes. However, research of Inkmann et al. (2011) and Cappelletti, Guazzarotti, and Tommasino (2013) demonstrated no significant relationship between child status and decision to annuitize the wealth.

(vii) Health Status : Chou et al. (2006) did not find any significant relationship between health and interest in RM. Nakajima and Telyukova (2017) identified a positive relationship between poor health and willingness to consume home as to bear the large sum of medical expenses. Contrary to these, Brown et al. (2008), Cappelletti et al. (2013), and Inkmann et al. (2011) claimed that elders with fair health were more willing to annuitize their wealth.

(viii) Residential Location : In terms of wealth allocation, the traditional compliance of some geographical area of countries differs from another, and thus, it may impact potential demand of RM. Some studies (like Costa - Font et al. 2010) demonstrated no significant difference between different regions of country and intention to use home equity loans. However, Fornero et al. (2016), Rauterkus et al. (2009), and Lee (2005) envisioned that regions were significantly different in terms of RM willingness.

(ix) Life Expectancy : Expectation of long life causing uncertainty hinders the demand of products like RM (Mayer & Simons, 1994), thus RM is negatively associated with life expectancy. On the other hand, results by Inkmann et al. (2011), Mitchell and Piggott (2004), and Salandro and Harrison (1997) advocated a long life span to be positively linked with intention to use home for RM.

(x) Awareness : Many researchers extensively examined the relationship between awareness of RM and

willingness to use the same. Rauterkus et al. (2009), Costa - Font et al. (2010), and Davidoff et al. (2017) found a positive and significant relationship between awareness of RM and willingness to avail it, while Gupta and Kumar (2017a) did not discover a significant relationship between both the variables.

As it is clear from literature, several demographic factors influence demand of RM, yet most of the studies have been conducted in a Western context. As per our knowledge, no prior research exists which considers influence of demographic determinants on the willingness of older Indians to take RM, thus by doing so, the present study attempts to bridge the literature gap.

Objective of the Study

The principal objective of this study is to examine the influence of demographic factors : age, gender, education, marital status, living arrangement, child status, health, region, life expectancy, and awareness on willingness of elderly Indians to take reverse mortgage (RM).

Research Methodology

(1) Sample : The sampling unit for this study are elderly people who met the two criteria : (a) people aged 60 years or above, and (b) elderly who possessed home ownership. To gauge the willingness of elderly for RM in a country like India, which is a growing pillar of urbanization and modernization along with strong traditional value system is complex. Thus, it was justified collecting sample from both sides. For proper representation of elderly Indians, the sample was taken from both areas : metro as well as non metro. Being capital of India, Delhi as a symbol of modernity was picked out from metro cities, while three cities of Rajasthan, that is, Jaipur, Ajmer, and Alwar were selected as representatives of Indian culture.

(2) Sampling Technique : Due to non availability of data composite of population characteristics and home ownership, probability sampling techniques cannot be used. To accomplish the objective of the current study, framing of sample was done by combining purposive and snowball sampling methods, which are non probability sampling techniques.

(3) Sample Size : A total of 625 respondents were visited between November 2016 - May 2017, but we received a total of 410 responses, having a response rate of 69.5% (which is quite moderate in primary data research) which were used to solve the research question. The number of respondents from metro city was 200 and from non metros, it was 210.

(4) Data

(i) Data Collection Tool : Data for this research were collected through a self structured schedule. As respondents of the study were elderly people and concept of RM is not popular in India ; hence, to eliminate the chances of error and to add more accuracy, data were collected personally through face to face interactions by us.

(ii) Dependent Variable : The DV of the current study is whether the respondent is willing to use reverse mortgage in later life. The willingness to use RM is coded binary, 1 = willing to use RM or 0 = not willing to use RM.

(iii) Independent Variables : The current study, in order to accomplish research objectives, includes a number of demographic determinants as independent variables. Age, gender, education, marital status, living arrangement, child status, health, region, life expectancy, and awareness of RM are considered as independent variables.

Table 2. Summary of Survey Respondents and Variables Under Study

Type of Data	No. of Respondents	% of Total
Independent Variables		
Gender		
Female	151	36.8
Male	259	63.2
Education		
No Formal Education	85	20.7
Primary	117	28.5
Secondary	137	33.4
College	55	13.4
Professional	16	3.9
Marital Status		
Married	255	62.2
Widow	132	32.2
Separated	14	3.4
Unmarried	9	2.2
Child Status		
Having both son & daughter	252	61.5
Son only	93	22.7
Daughter only	37	9.0
Childless	28	6.8
Living Arrangement		
Living with family in own home	262	63.9
Living with spouse only in own home	85	20.7
Living alone in own home	27	6.6
Living in child/relative's home	8.8	8.8
Residence		
Metro	200	48.8
Non-metro	210	51.2
Awareness		
Aware	30	7.3
Unaware	380	92.7
Dependent Variable		
Willingness for RM		
Willing	76	18.5
Non-willing	334	81.5

Age and life expectancy are treated as continuous variables. Except these two, other variables are taken as categorical variables. These variables are coded into various categories like gender into two, education into five, marital status into four, living arrangement into four, child status into four, health into three, residence into two, and awareness of RM is measured into two categories. Data related to all variables used in the study are shown in Table 2.

(5) Hypotheses : The hypotheses formulated to examine the relationship between demographic variables and willingness to take up RM are extracted from prior studies. These are :

- ↪ **H0₁:** There is no significant relationship between elderly age and willingness to use RM.
- ↪ **Ha₁:** There is a significant relationship between elderly age and willingness to use RM.
- ↪ **H0₂:** There is no significant relationship between gender and willingness to use RM.
- ↪ **Ha₂:** There is a significant relationship between gender and willingness to use RM.
- ↪ **H0₃:** There is no significant relationship between educational level and willingness to use RM.
- ↪ **Ha₃:** There is a significant relationship between educational level and willingness to use RM.
- ↪ **H0₄:** There is no significant relationship between marital status and willingness to use RM.
- ↪ **Ha₄:** There is a significant relationship between marital status and willingness to use RM.
- ↪ **H0₅:** There is no significant relationship between living arrangement choices and willingness to use RM.
- ↪ **Ha₅:** There is a significant relationship between living arrangement choices and willingness to use RM.
- ↪ **H0₆:** There is no significant relationship between child status and willingness to use RM.
- ↪ **Ha₆:** There is a significant relationship between child status and willingness to use RM.
- ↪ **H0₇:** There is no significant relationship between health status and willingness to use RM.
- ↪ **Ha₇:** There is a significant relationship between health status and willingness to use RM.
- ↪ **H0₈:** There is no significant relationship between geographic region of residence and willingness to use RM.
- ↪ **Ha₈:** There is a significant relationship between geographic region of residence and willingness to use RM.
- ↪ **H0₉:** There is no significant relationship between life expectancy and willingness to use RM.
- ↪ **Ha₉:** There is a significant relationship between life expectancy and willingness to use RM.
- ↪ **H0₁₀:** There is no significant relationship between awareness of RM and willingness to use RM.
- ↪ **Ha₁₀:** There is a significant relationship between awareness of RM and willingness to use RM.

Dependent variable being binary nature and independent variables being continuous and categorical nature, binary logistic regression is used to analyze the relationship between DV and IVs with the help of IBM SPSS 21 Software.

In order to test hypotheses, the model is defined as :

$$\text{Logit}(P_i) = \ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1\chi_1 + \beta_2\chi_2 + \beta_3\chi_3 + \dots\dots\dots\beta_k\chi_k + \mu$$

where,

- Logit(P_i) = Log of odds that an event would occur,
- P_i = 1 if i^{th} older homeowner is willing to take RM,
- $1-P_i$ = 0 if i^{th} older homeowner is not willing to take RM,
- β_0 = Constant term,
- $\beta\chi$ = Independent variables,
- β_k = Beta coefficients of explanatory variables,
- μ = Error term.

Table 3. Logistic Regression Results

Variables	B	df	Sig.	Exp(B)	Alternative Hypothesis
					Testing Results
Female	.316	1	.421	1.372	Reject
Age	.147	1	.031**	1.158	Accept
Education		4	.421		Reject
No formal	1.211	1	.420	3.356	
Primary	.635	1	.669	1.887	
Secondary	.858	1	.549	2.358	
College	-.076	1	.957	.927	
Marital Status		3	.408		Reject
Unmarried	-.512	1	.716	.599	
Married	.440	1	.730	1.552	
Widow	1.107	1	.373	3.026	
Child Status		3	.000***		Accept
Daughter only	1.840	1	.000***	6.300	
Childless	2.596	1	.000***	13.411	
Son only	-.318	1	.507	.728	
Living Arrangement		3	.000***		Accept
With spouse only	1.664	1	.000***	5.282	
Child's home	.074	1	.911	1.077	
Alone in own home	3.052	1	.000***	21.153	
Life Expectancy	.351	1	.000***	1.420	Accept
Health		2	.051*		Accept
Poor health	1.260	1	.045**	3.525	
Average health	1.006	1	.020**	2.735	
Non - Metro	-.656	1	.071*	.519	Accept
Unaware	1.271	1	.290	3.565	Reject
Constant	-18.828	1	.001	.000	
Model Summary					
χ^2	149.488				
df	20				
Sig	.000				
Cox and Snell R^2	.306				
Nagelkerke R^2	.495				
-2 Log Likelihood	243.467				
Hosmer Lameshow χ^2	5.243				
df	8				
Sig	.731				
Classification Accuracy	88.3				

1.*** showing significance at .01, ** showing significance at .05, and * showing significance at .1.

2. Reference or omitted categories are to be male, professional, separated, having both son & daughter, living with family in own home, healthy, resident of metro, and aware about RM.

3. -2Log Likelihood in 0 block is 393.13 ; classification accuracy in 0 model is 81.5.

Analysis and Results

Logistic regression model fulfills criteria of goodness of fit by having prediction accuracy of 88.3% with explanatory variable in comparison of 81.5% without predictors. Adding explanatory variables to the model reduces -2LL from 3931.3 to 243.467 as a key symbol of model accuracy.

The results of the current study are displayed in the Table 3. Results of binary logistic regression strongly depict that apart from gender, marital status, education, and awareness of RM, the remaining explanatory variables are found to be strong predictors of RM willingness. The results of the present study provide more insights about the Indian RM market, thus adding value to a particular branch of knowledge, with special reference to the Indian context. The following sections discuss the results of hypotheses testing and their possible practical interpretations :

(i) Age and Willingness to use RM : The results from logistic regression reject the H_{01} that there is no significant relationship between age and willingness to use RM and alternative hypothesis that there is a significant relationship between age and willingness to use RM is accepted as significance level is below 5%. Direction of beta coefficient in Table 3 is positive, which demonstrates that as age increases, older homeowners become more willing to use RM. Exponential β for age (1.158) indicates that each addition in the age of the respondent increases the odd of willingness to use RM by 15.8%.

The results of the current study are consistent with the findings of prior studies (Chatterjee, 2016 ; Chou et al., 2006), which also found that older elderly homeowners were more willing to use RM than younger elderly homeowners. However, the results of this study are not similar with the findings of Rauterkus et al. (2009) and Fornero et al. (2016), who envisioned age to be negatively correlated with willingness to use RM. Since old age is a focal point of adversities in which financial crises trouble the most ; so, in absence of any family support or due to any other reason, an older homeowner may be willing to use RM as a last resort. Thus, this result supports the assumption that RM may help older homeowners to satisfy their varying needs of funds like for daily consumption and long term health care.

(ii) Gender and Willingness to use RM : The results from logistic regression fail to reject the H_{02} that there is no significant relationship between gender and willingness to use RM. Positive direction of β coefficient in Table 3 depicts that women were more willing than men to use RM, exponential β (1.372) (indicates older women homeowners were 37.2% more willing than men to use RM, yet not proven statistically. Thus, the current study concludes that men and women were indifferent in use of RM ; thus, gender does not influence willingness to use RM.

The results of this hypothesis are consistent with the findings of the previous studies (Fornero et al., 2016; Ong, 2008) that also found women to be more willing than men to opt for RM, though statistically. The findings related to this hypothesis are interesting in the Indian context, where women usually have risk and debt aversion and frequently do not participate in financial decision making, however, here, they showed interest in RM more than men. This finding may be due to the fact of larger life span of women than men, more financial vulnerability, and due to the present era of empty nests and increasing cases of elder abuse.

(iii) Education and Willingness to use RM : The results from logistic regression fail to reject the H_{03} that there is no significant relationship between educational level and willingness to use RM. Although insignificant, but exponential β in Table 3 indicates that the odd for RM willingness is greater by 3.356, 1.887, and 2.358 times, respectively for no education, primary education, and secondary education than older with professional education. This result depicts, though insignificantly, that people with highest level of education were less willing than others to use RM. The results of this hypothesis are consistent with the findings of Davidoff et al. (2017),

Duca and Kumar (2014), Fornero et al. (2016), and Lusardi and Mitchell, (2007), who found a negative relationship between education/ financial literacy and willingness to use RM. One possible reason for aversion to RM by highly educated people may be that they were aware about risks inherited in annuity products and their complexity and had better retirement planning than others, and hence, they don't need products like RM to keep them financially secure in their later years.

(iv) Marital Status and Willingness to use RM : The results from logistic regression fail to reject the H_{04} that there is no significant relationship between marital status and willingness to use RM. All dummy coefficients in Table 3 representing unmarried, married, and widowed elderly people are insignificant, but demonstrate that married older homeowners were 55.2% more willing than omitted category (separated) to use RM ; while exponential β for widowed persons shows that they were 202.6% more willing than the omitted category (separated) to use RM. The results for the current hypothesis, though insignificant, are in line with the findings of Salandro and Harrison (1997), who found married homeowners were more willing to opt for RM than others ; Fornero et al. (2016) and Ong (2008) detected the fact that widowhood was a significant predictor for the uptake of RM. The possible reason for willingness of married people for RM might be larger consumption need of household in comparison of single ones and empty nest families in which children depart from parents for employment opportunities and parents remain alone. Thus, due to lesser bequest motives, married couples may look at RM as an opportunity to convert illiquid wealth into cash streams.

(v) Living Arrangement and Willingness to use RM : The results from logistic regression reject the H_{05} that there is no significant relationship between living arrangement conditions of elderly homeowners and willingness to use RM and accept the alternative hypothesis that there is a significant relationship between living arrangement and willingness to use RM. Elderly homeowners living alone in own homes were more willing than others to take RM, as the results in Table 3 show a significant and positive relationship between older people who were living alone and willingness to use RM. Exponential β coefficients for older people living alone and living with only spouse depict that they were significantly 21 times and five times, respectively more willing to use home equity through RM than homeowners who were living with family. However, not significant exponential β for dummy variable : older living in child/relative's home was 7.7% more willing than base category.

The results of this hypothesis are consistent with the findings of prior studies (Gupta & Kumar, 2016 ; Painter & Lee, 2009) which found that proximity to children lowered the probability of homeowners to trade-down ; Gardner and Wadsworth (2004) discovered larger family size was negatively associated with willingness to annuitize wealth. The results of this hypothesis are also similar to the findings obtained by Case and Schanre (1994), who found that elderly people who were living alone showed interest in products like RM. This result suggests that Indian elderly homeowners who were alone or not living with kith & kin (thus there may be an absence of bequest motive), they might be interested to tap housing wealth for supplementing finances without depending on others.

(vi) Child Status and Willingness to use RM : The results from logistic regression reject the H_{06} that there is no significant relationship between child status of elderly homeowners and willingness to use RM and accept the alternative hypothesis that there is a significant relationship between child status and willingness to use RM. The results of exponential β in Table 3 display that childless homeowners and elderly having only daughters were significantly 13.41 and 6.3 times, respectively more willing to use RM than homeowners who had both son and daughter. Also, exponential β for dummy variable : older with son only shows they were 27.2% less willing than the base category.

The results of this hypothesis are unanimous with the findings of Chiuri and Jappelli (2010), Chou et al. (2006), Dillingh et al. (2017), and Fornero et al. (2016), who found the same that childlessness was positively

associated with the willingness to use RM and larger number of children was negatively linked with the willingness to use RM. The possible reason for this result in the Indian context might be a poor social security system, and if coupled with negligence from children, then this makes the elderly vulnerable. The prevailing system of old care vests around the boundary of family where kith and kin care for the elderly and home is given as inheritance to family members. In India, responsibility of old parent care lies on the shoulder of sons rather than on daughters. Thus, the results are in line with Indian traditions too, where instead of being dependent on daughters in old age, people consider it better to use their own resources. Being childless reduces the possibility of bequest, thus home can be used as lifelong pension by this segment.

(vii) Health and Willingness to use RM : The results from logistic regression reject the H_{07} that there is no significant relationship between health status of elderly homeowners and willingness to use RM and accept the alternative hypothesis that there is a significant relationship between health status and willingness to use RM. The results of exponential β in Table 3 display that homeowners with poor health and average health were significantly 3.5 times and 2.7 times, respectively more willing to take RM than those older homeowners who had fair health status.

These results are in tune with the findings of Nakajima and Telyukova (2017), who observed the same results that poor health was positively associated with a willingness to use RM. Yet, there are research findings which concluded that poor health was negatively linked with RM willingness. Brown et al. (2008), Cappelletti et al. (2013), Chatterjee (2016), and Inkmann et al. (2011) concluded that elderly homeowners with fair health were more likely to use home equity. The reason of this finding may be that in India, elderly with poor health are more likely to use RM for assuring safety net for daily medical expenses in old age. Thus, to satisfy the precautionary motive, the elderly may be willing to use RM.

(viii) Area of Residence and Willingness to use RM : The results from logistic regression reject the H_{08} that there is no significant relationship between region of residence of elderly homeowners and willingness to use RM and accept the alternative hypothesis that there is a significant relationship between region of residence and willingness to use RM. The negative sign of β and value of exponential β (.589) in Table 3 depicts that homeowners who were living in non - metro cities were significantly 48.1% less likely to consider RM than those residing in metros.

These results are unanimous with the findings of Fornero et al. (2016), Lee (2005), and Rauterkus et al. (2009) who observed that different regions had significantly varied willingness for RM. The findings of this hypothesis reveal that there is a significant difference in the willingness to use RM in different geographic regions. Elderly from metros were more likely to use RM than elderly from non-metro cities. The reason for more willingness from metro cities may be due to increased modernization, privilege given to nuclear family and shaking family bonds, a place where elders are not as much respected as they should, while family values still exist in towns and non-metro cities, hence older homeowners from Rajasthan were less willing to use RM.

(ix) Life Expectancy and Willingness to use RM : The results from logistic regression reject the H_{09} that there is no significant relationship between life expectancy of elderly homeowners and willingness to use RM and accept the alternative hypothesis that there is a significant relationship between life expectancy and willingness to use RM. The positive direction of beta coefficient and exponential β coefficient value of 1.420 in Table 3 indicates that odds of willingness in RM significantly increase by 42% for an addition of each one year. Thus, older homeowners who expected to live longer were more willing to use RM than those who did not expect a longer life.

The current results are similar to the results obtained by Mitchell and Piggott (2004) and Salandro and Harrison (1997), who detected the fact that in comparison to olders who expected a short span of life, older homeowners who expected a large life span were more interested in annuity products like RM to make old age

safe. The possible reason for this finding may be the elderly home owner's perception that they will receive their whole life a certain amount, thus less anxiety of future and reduction of uncertainty. So, elderly homeowners who expected to live longer were more willing than others to use RM.

(x) Awareness and Willingness to use RM : The results from logistic regression fail to reject the H_{010} that there is no significant relationship between awareness of reverse mortgage and willingness to use it. Although insignificant, exponential β for dummy variable : unaware having value of 3.565 in Table 3 reveals that older homeowners who were unaware about the concept of RM as retirement funding tool were 3.6 times more willing to use it than homeowners who knew about RM.

The results of this hypothesis are contrary to the findings of studies conducted by Rauterkus et al. (2009) and Davidoff et al. (2017), who demonstrated that awareness of RM was positively and significantly related with the willingness to use RM. The current results are in line with the findings of Gupta and Kumar (2017a), who found that there was no significant relationship between awareness of RM and willingness towards it.

One possible explanation of this reason might be the educational level. Summary of respondents who were aware about RM demonstrates that they were highly qualified, and RM in the Indian market is still not attractively bundled as to provide maximum utility to older homeowners. Higher education leads towards better retirement planning, more financial security, better knowledge of various combinations of risk - returns in avenues of financial products, thus leading to an antipathetic attitude for complex annuity products. In contrast, older homeowners who are less educated or have no education have meager financial sources, thus they might be ready to tap home equity for later life. Another reason for this result may be that the awareness of RM is identically low and lenders of RM themselves are reluctant to promote this product.

Policy Implications

This study recommends to policy makers and lenders that mere introduction of RM in a portfolio of pension products is not sufficient. Redesigning of RM features appropriately may result into a large market of new emerging segment. The results reveal that there is a hidden potential of RM in India. More than 18% of the surveyed respondents were willing to tap their housing assets, which is not a petty figure for lenders, and a potential segment with graying India in the coming decades. Promotion of awareness of RM is not sufficient; it should be promoted among a real segment, that is, the elderly who are childless, living alone or having empty nests, having poor health, and residing in metros. Awareness promotion programs must be targeted at the elderly with less education and also linked with counseling and simple way of understanding, which reduces complexity for elders in decision making. By adding such features and catering to a proper segment, RM may become a weapon to alleviate financial adversity in old age and may lead to quality aging in India.

Conclusion

The prominent purpose to conduct this research was to analyze various demographic factors which contribute or hinder the potential demand of RM. By exploring studies based on the life cycle model from multi disciplines like sociology, economics, finance, geriatrics and gerontology, various demographic variables were extracted. To be older, childless, living alone or with spouse only in home, resident of metro, ill health, and longer life expectancy are key demographic variables that positively and significantly influence demand for RM. Gender, marital profile, and education are found to be insignificant to impact the RM market. Awareness, though insignificant, is negatively related with willingness. In a nut shell, the current study reveals that demographic variables play an important role in decision making to use reverse mortgage for late years' retirement funding.

Limitations of the Study and Scope for Future Research

Small sample size and limited geographic area of sampling are an inherent limitation of the current study. Hence, the results can't be generalized. However, willingness to use reverse mortgage depends on various other factors like financial and psychological as well. The results of the study are derived from responses of older homeowners, which are not supposed to be static, may be biased, thereby affecting the outcomes of the study. With an aim to remove the above - said limitations, future studies may occupy larger sample size and more advanced statistical techniques for analysis and interpretation. Furthermore, by including other financial and psychological factors, a better model can be constructed to gauge the willingness of older homeowners for reverse mortgage products.

References

- Brown, J. R., Kling, J. R., Mullainathan, S., & Wrobel, M. V. (2008). Why don't people insure late - life consumption? A framing explanation of the under-annuitization puzzle. *The American Economic Review*, 98 (2), 304 - 309.
- Brownfield, C. (2014, May). *The fourth pillar - The role of home equity release in retirement funding* (Actuaries Institute 2014 Financial Services Forum). Retrieved from <https://actuaries.asn.au/Library/Events/FSF/2014/BrownfieldFourthPillarPaper140505.pdf>
- Cappelletti, G., Guazzarotti, G., & Tommasino, P. (2013). What determines annuity demand at retirement ? *The Geneva Papers on Risk and Insurance - Issues and Practice*, 38 (4), 777 - 802. DOI : <https://link.springer.com/article/10.1057/gpp.2012.43>
- Case, B., & Schnare, A. B. (1994). Preliminary evaluation of the HECM reverse mortgage program. *Real Estate Economics*, 22 (2), 301 - 346. doi : <http://onlinelibrary.wiley.com/doi/10.1111/1540-6229.00636/full>
- Chatterjee, S. (2016). Reverse mortgage participation in the United States: Evidence from a national study. *International Journal of Financial Studies*, 4 (1), 1-10. DOI : <http://dx.doi.org/10.3390/ijfs4010005>
- Chiuri, M. C., & Jappelli, T. (2010). Do the elderly reduce housing equity? An international comparison. *Journal of Population Economics*, 23 (2), 643 - 663. doi : <https://link.springer.com/article/10.1007/s00148-008-0217-4>
- Chou, K. L., Chow, N. W., & Chi, I. (2006). Willingness to consider applying for reverse mortgage in Hong Kong Chinese middle-aged homeowners. *Habitat International*, 30 (3), 716-727. DOI : <https://doi.org/10.1016/j.habitatint.2005.04.008>
- Costa-Font, J., Gil, J., & Mascarilla, O. (2010). Housing wealth and housing decisions in old age: Sale and reversion. *Housing Studies*, 25(3), 375 - 395. DOI : <https://doi.org/10.1080/02673031003711014>
- Davidoff, T. (2010). Home equity commitment and long-term care insurance demand. *Journal of Public Economics*, 94 (1), 44 - 49. doi : <https://doi.org/10.1016/j.jpubeco.2009.09.006>
- Davidoff, T., Gerhard, P., & Post, T. (2017). Reverse mortgages: What homeowners (don't) know and how it matters. *Journal of Economic Behavior & Organization*, 133, 151-171. doi : <https://doi.org/10.1016/j.jebo.2016.11.007>

- Dillingh, R., Prast, H., Rossi, M., & Brancati, C. U. (2017). Who wants to have their home and eat it too? Interest in reverse mortgages in the Netherlands. *Journal of Housing Economics*, 38, 25 - 37.
- Duca, J. V., & Kumar, A. (2014). Financial literacy and mortgage equity withdrawals. *Journal of Urban Economics*, 80, 62 - 75. DOI : <https://doi.org/10.1016/j.jue.2013.08.003>
- Fornero, E., Rossi, M. C., & Brancati, M. C. U. (2016). Explaining why, right or wrong, (Italian) households do not like reverse mortgages. *Journal of Pension Economics & Finance*, 15(2), 180-202. DOI : <https://doi.org/10.1017/S1474747215000013>
- Gardner, J., & Wadsworth, M. (2004). *Who would buy an annuity ? An empirical investigation*. DOI : <https://dx.doi.org/10.2139/ssrn.892767>
- Gupta, S., & Kumar, S. (2016). Factors influencing Indian elderly to consider reverse mortgage in later life. In P. Ahuja, & A. Awasthi (eds.), *Recent trends in economics, finance and HRM* (pp.157-170). Gujarat : Excel India Publishers.
- Gupta, S., & Kumar, S. (2017a). Investigating relationship between demand and awareness of reverse mortgage: An empirical analysis from India. *Journal for Studies in Management and Planning*, 3(13), 240 - 248.
- Gupta, S., & Kumar, S. (2017b). Aging India: Opportunities and challenges for retail banking. In A. Naidu, M. Shukla, A. Attri, R. Sainy, & S. Miital (eds.), *Achieving corporate excellence in changing times* (pp. 22 - 29). JIM, Indore : Excel India Publishers.
- Hirayama, Y. (2010). The role of home ownership in Japan's aged society. *Journal of Housing and the Built Environment*, 25(2), 175-191. DOI : <https://doi.org/10.1007/s10901-010-9183-8>
- Inkmann, J., Lopes, P., & Michaelides, A. (2011). How deep is the annuity market participation puzzle ? *The Review of Financial Studies*, 24(1), 279-319. doi : <https://doi.org/10.1093/rfs/hhq080>
- Jaishankar, P. (2010). Reverse mortgages in India: New dimensions in emerging horizons. *Indian Journal of Finance*, 4(11), 44 - 52.
- Kaur Brar, J. (2011). Reverse mortgage: It's potentials in Indian market. *Pranjana: The Journal of Management Awareness*, 14(1), 52 - 66.
- Lee, Y. G. (2005). Baby boomers and home equity borrowing. *Journal of Financial Counseling and Planning*, 16(2), 49 - 61.
- Lusardi, A., & Mitchell, O. S. (2007). Baby boomer retirement security: The roles of planning, financial literacy, and housing wealth. *Journal of Monetary Economics*, 54(1), 205-224. DOI : <https://doi.org/10.1016/j.jmoneco.2006.12.001>
- Mayer, C. J., & Simons, K. V. (1994). Reverse mortgages and the liquidity of housing wealth. *Real Estate Economics*, 22(2), 235 - 255. DOI : <http://onlinelibrary.wiley.com/doi/10.1111/1540-6229.00634/full>
- Mitchell, O. S., & Piggott, J. (2004). Unlocking housing equity in Japan. *Journal of the Japanese and International Economies*, 18, 466 - 505. DOI : <https://doi.org/10.1016/j.jjie.2004.03.003>
- Nakajima, M., & Telyukova, I. A. (2017). Reverse mortgage loans: A quantitative analysis. *The Journal of Finance*, 72(2), 911 - 950. doi : <http://onlinelibrary.wiley.com/doi/10.1111/jofi.12489/full>

- Ong, R. (2008). Unlocking housing equity through reverse mortgages: The case of elderly homeowners in Australia. *International Journal of Housing Policy*, 8(1), 61-79. doi : <https://doi.org/10.1080/14616710701817166>
- Ong, R. (2009). House price appreciation in old age: Analysis and issues for the use of reverse mortgages as a retirement funding strategy in Australia. *Journal of Population Ageing*, 2 (3-4), 139 - 160. DOI : <https://doi.org/10.1007/s12062-010-9021-5>
- Painter, G., & Lee, K. (2009). Housing tenure transitions of older households: Life cycle, demographic, and familial factors. *Regional Science and Urban Economics*, 39(6), 749-760. doi : <https://doi.org/10.1016/j.regsciurbeco.2009.07.006>
- Rauterkus, S., Munchus, G., & Slawson Jr, V. C. (2009). The home equity conversion mortgage: A study of attitudes and awareness. *Journal of Real Estate Portfolio Management*, 15 (3), 267-280. DOI : <https://doi.org/10.5555/repn.15.3.d1282rt22714l8p680>
- RGI. (2011). *Census India, SRS Bulletin*. Registrar General of India, Govt. of India. Retrieved from http://www.censusindia.gov.in/vital_statistics/SRS_Report/9Chap%202%20-%202011.pdf
- Salandro, D., & Harrison, W. B. (1997). Determinants of the demand for home equity credit lines. *Journal of Consumer Affairs*, 31(2), 326-345. doi : <http://onlinelibrary.wiley.com/doi/10.1111/j.1745-6606.1997.tb00394.x/full>
- Srivastava, A., & Mohanty, S.K. (2012). Poverty among elderly in India. *Social Indicators Research*, 109 (3), 493 - 514. DOI : <http://doi/10.1007/s11205-011-9913-7>
- United Nations, Department of Economics and Social Affairs, Population Division (2013). *World population ageing 2013 (ST/ESA/SER.A/348)*. Retrieved from <http://www.un.org/en/development/desa/population/publications/pdf/ageing/WorldPopulationAgeing2013.pdf>
- United Nations, Department of Economics and Social Affairs, Population Division (2015). *World population ageing 2015 (ST/ESA/SER.A/390)*. Retrieved from http://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2015_Report.pdf

About the Authors

Sarita Gupta is a Senior Research Fellow, currently pursuing her research in Department of Management, Central University of Rajasthan, Rajasthan. Her areas of research interests include Retirement Planning, Aging and Social Security, Reverse Mortgage, and Behavioral Finance.

Dr. Sanjay Kumar has a Doctorate in Finance and is currently serving as an Assistant Professor in the Department of Management, Central University of Rajasthan, Rajasthan. He also holds a post doctoral degree from California State University, California, USA. He is keenly interested in interdisciplinary research, and has a number of publications in various refereed journals.