

Chapter 4

Empirical Results

- on the aspect of borrowers

4.1 Descriptive Statistics

The descriptive statistics of the sample is described in the following Table 4.1 and Table 4.2. The mean age of the respondents was 43.9, the mean number of children was 1.5, which is higher than the total fertility rate in Taiwan in 2007 (1.1%), and the mean wealth level and education level were of middle standard. Moreover, the average housing age they had was 15.4 years, with a mean housing value of about NT\$8.3 million. The high housing value it could be due to the large proportion of the sample living in the north area (88.4%), where real estate values are generally higher compared to the rest of the island. Among the 396 respondents, 33.6% were willing to apply for RM, with 66.4% of no intention. Moreover, this study shows which type of RM the respondents were interested in.

Table 4.1 Descriptive Statistics of the questionnaire

	Age	Childnu	Hage	Hvalue	Income	Wealth	Education
Sum	17,403	576	6,126	3,312,000,000	36,464,000	1,078	1,591
Std. Error of Mean	0.44	0.05	0.48	256,205	1,866	0.03	0.05
Median	43	2	15	6,000,000	89,000	3	4
Std. Deviation	8.937	1.089	9.576	5,098,432	37,644	0.656	0.91
Skewness	0.080	0.135	0.489	1.01	-0.090	-0.616	-0.660
Std. Error of Skewness	0.123	0.123	0.123	0.123	0.123	0.123	0.123
Kurtosis	-1.181	-0.263	-0.289	0.695	-1.332	0.964	1.269
Std. Error of Kurtosis	0.245	0.245	0.245	0.245	0.245	0.245	0.245
Minimum	30	0	1	2,000,000	26,000	1	1
Maximum	60	6	50	22,000,000	136,000	5	6
Mean	43.9	1.5	15.4	8,363,636	92,080	2.7	4.0

Table 4.2 The Description of Variables

Variables	Description	Willingness	p-value
<i>Panel A: Demographic Variables</i>			
Age	Age in years		0.068
Gender	Gender		0.418
female	=0 (40.4%)	31.3%	
male	=1 (59.6%)	35.2%	
Marital	Marital status		0.445
Married	=0 (81.1%)	32.7%	
Single	=1 (18.9%)	37.3%	
Education	Educational level		0.115
Career	Career type		0.112
no career or retired	=0 (8.3%)	21.2%	
primary Industry	=1 (1.0%)	0.0%	
secondary industry	=2 (7.3%)	44.8%	
tertiary industry	=3 (83.3%)	34.2%	
Childnu	Number of Children		0.529
<i>Panel B: Real Estate Variables</i>			
Sechouse	Having second home or more		0.528
no	=0 (70.5%)	32.6%	
yes	=1 (29.5%)	35.9%	
Hage	Housing age in year		0.919
Hvalue	Value of house (NT\$)		0.931
less than 4,000 thousand	=2,000,000 (16.7%)	30.3%	
4,001-8,000 thousand	=6,000,000 (40.9%)	34.6%	
8,001-12,000 thousand	=10,000,000 (23.0%)	35.2%	
12,001-16,000 thousand	=14,000,000 (10.6%)	28.6%	
16,001-2,000 thousand	=18,000,000 (3.8%)	33.3%	
more than 2,001 thousand	=22,000,000 (5.1%)	40.0%	
Letting	Letting their house		0.696
no	=0 (75.5%)	34.1%	
yes	=1 (24.5%)	32.0%	
Location	House location		0.610
north area	=1 (88.4%)	33.7%	
central area	=2 (2.5%)	20.0%	
south area	=3 (7.1%)	32.1%	
east area	=4 (2.0%)	50.0%	

Panel C: Asset and Income Variables

Employment	Having income		0.273
no	=0 (2.8%)	34.0%	
yes	=1 (97.2%)	18.2%	
Income	Average Domestic Income per month (NT\$)		0.321
less than 37 thousand	=26,000 (7.1%)	25.0%	
37-56 thousand	=36,000 (13.6%)	33.3%	
57-76 thousand	=66,000 (17.7%)	25.7%	
77-10.6 thousand	=89,000 (24.7%)	39.8%	
more than 10.7	=136,000 (36.9%)	34.9%	
Asset	Major asset type		0.024
cash/deposit/gold	=0 (54.5%)	28.7%	
stock/bond/fund	=1 (45.5%)	39.4%	
Insurance	Have insurance		0.026
no	=0 (35.4%)	26.4%	
yes	=1 (64.6%)	37.5%	

Panel D: Subjective Perception Variables

Wealth	5-point scale ranging from 1=poor to 5 = wealthy		0.385
Bequest	People have to take house as a bequest		0.022
not agree	=0 (41.7%)	40.00%	
agree	=1 (58.3%)	29.00%	
Livealone	Want to live without children after retirement		0.022
no	=0 (37.1%)	26.53%	
yes	=1 (62.9%)	37.75%	

As shown in Figure 4.1 & Figure 4.2, about 6.8% of the respondents were interested in lump-sum payment, 62.4% in annuity, and 30.8% in line-of-credit payment of RMs. As for the motivations, improving the quality of life (47%) and sharing daily living cost (33%) are the first and second.

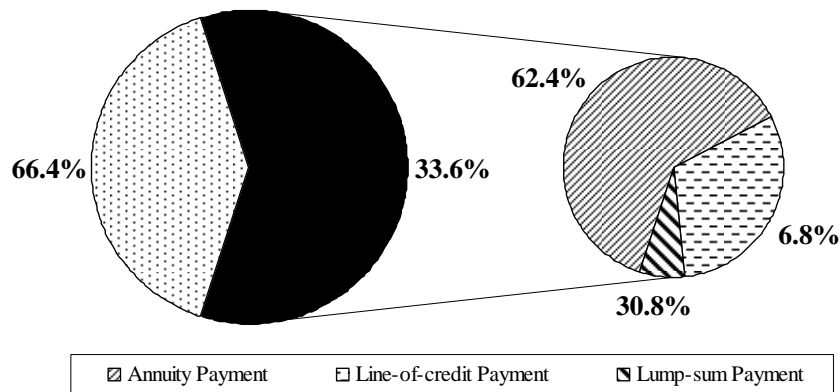


Figure 4.1 The result on analyzing the different type of RM

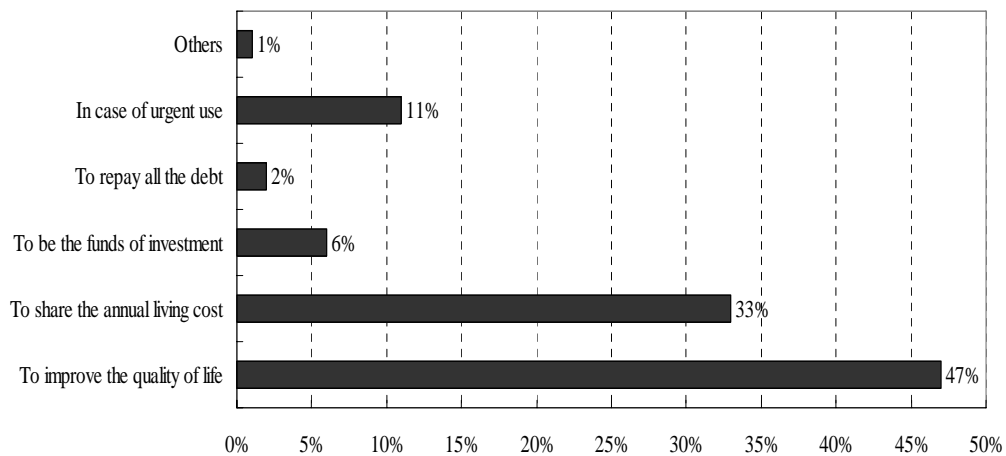


Figure 4.2 The result on the motivation of RM

On the contrary, compared to those who are not willing to apply for RM, the Figure 4.3 demonstrated the plan of taking their house as a bequest is in the first place (22.8%); the response of not understanding RM well in the second place (20.5%); and the intention to keep their houses after paying off the mortgage is in the third place (14.1%).

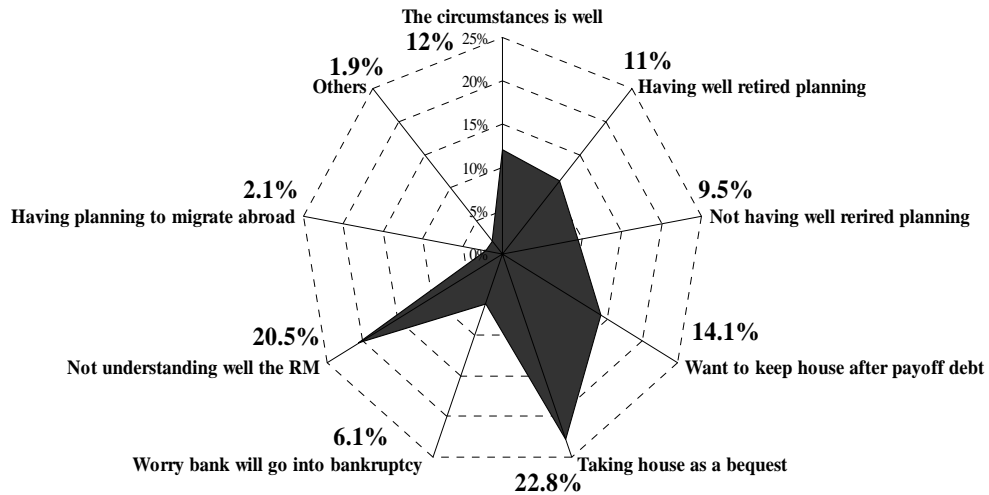


Figure 4.3 The result on analyzing the reasons of those have no intention to apply for RM

However, nearly half of the respondents (14.9%) declared that they will accept RM if it provides at least 41%~60% of the average monthly income (Figure 4.4). And about 14.9% of the respondents have heard about RM. It implies one of the goals could be to improve the knowledge of the reverse mortgage scheme for potential customers.

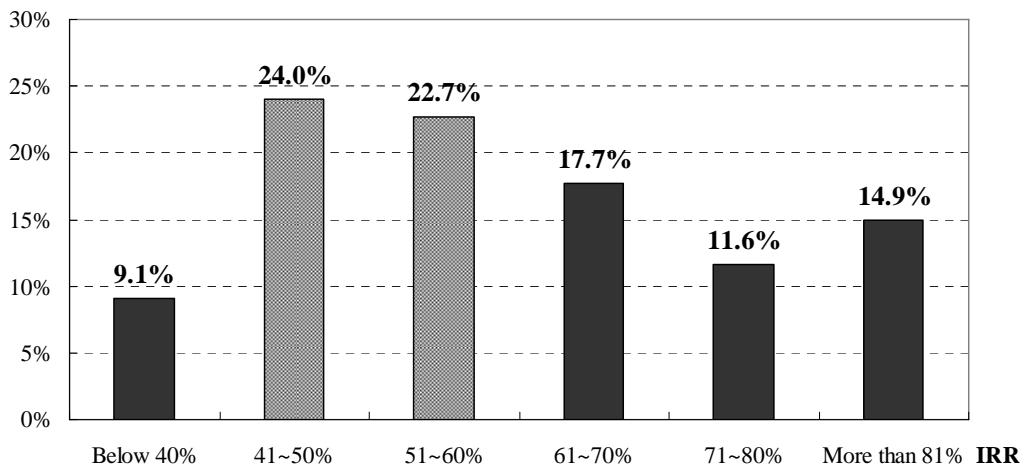


Figure 4.4 The result on analyzing the percentage of the IRR_{RM}

4.2 Model Test

A binary logistic regression was conducted and the empirical results are shown in Table 4.3 and Table 4.4. The overall percentage for corrected classification was 67.4% with significant tests of model coefficients ($\chi^2=41.666$, $p=0.007$) and the Hosmer-Lemeshow statistics indicated the suitability of the model (H-L= 4.961, $p=0.762$). In order to detect the severity of multi-collinearity between independent variables, the variance inflation factor (VIF) were calculated. The size of the VIF should be lower than 5 (Gujarati, 2003; Hair, Anderson, Tatham, & Black, 2006). The VIF in the independent variables were approximately below 2, except the variables of the number of children (VIF=2.196). Accordingly, all 18 variables were used in the logistics model.

Table 4.3 Classification Table

<u>Observed</u>	<u>Predicted*</u>		Percentage Correct
	Without intention to apply for RM	With intention to apply for RM	
Without intention to apply for RM	236	27	89.7
With intention to apply for RM	102	31	23.3
Overall Percentage			67.4

* The cut value is .50

Table 4.4 Result of the Logistic Regression

Covariate	B	Sig.	Odds Ratio	VIF
Hage	0.013	0.281	1.01	1.13
Sechouse	0.417	0.205	1.51	1.75
Hvalue	0.000	0.805	1.00	1.38
Letting	-0.416	0.224	0.66	1.64
Insurance	0.492	0.049 **	1.63	1.07
Employment	-0.066	0.940	0.93	1.15
Income	0.000	0.532	1.00	1.69
Asset	0.442	0.060 *	1.55	1.07
Wealth	-0.365	0.064 *	0.69	1.28
Bequest	-0.397	0.094 *	0.67	1.11
Livingalone	0.519	0.035 **	1.68	1.06
Gender	0.024	0.922	1.02	1.09
Age	0.000	0.989	1.00	1.87
Marital	0.353	0.335	1.42	1.65
Childnu	0.181	0.242	1.19	2.19
Area (north)	2.930	0.683		1.13
Area (east)	-0.779	0.297	0.45	
Area (central)	-1.259	0.256	0.28	
Area (south)	-0.876	0.308	0.41	
Education	0.402	0.010 ***	1.49	1.39
Career (tertiary)	20.959	0.411		1.19
Career (no/retired)	-0.603	0.213	0.54	
Career (primary)	-20.776	0.999	0.00	
Career (secondary)	0.423	0.327	1.52	
Constant	-2.037	0.119	0.13	

Hosmer and Lemeshow Statistic =4.961 With 8d.f. (p=0.762 n.s.)

Omnibus Tests of Model Coefficient: Chi-Square =41.666 With 22d.f (p=0.007***)

* p<0.1 ** p<0.05 *** p<0.01 n.s. p>0.1

4.3 Empirical Findings

As presented in Table 4.4, the empirical evidence of the binary logistic regression model indicated that 6 out of the 18 variables were statistically significant at the 0.1 level (90% Level of Confidence). The significant variables are discussed below as follows:

Education Level

Our analysis revealed that the higher the level of education, the greater the willingness to apply for RM. This may be attributed to the fact that the higher educational level of the respondents are, the greater the possibility for them to accept a new type of financial products. As mentioned before, among the 396 participants, about 34% willing to apply for RM have a master's or doctoral degree.

Security Assets

The evidence shows that homeowners who hold assets of stocks, bonds and funds as their major property are more likely to apply for RM. The significant factors of the education level and the security asset are in accordance with Chou's (2006) results. The possible reason is that the homeowners who possess assets of stocks, bonds and funds are more willing to accept financial products and RM.

Insurance

Results show that those who are in insurance programs tend to participate the RM scheme. It suggests that if people plan for retirement, they are inclined to purchase investment insurance, and therefore more likely to consider applying for RM for income after retirement.

This evidence is also supported in a survey made by the American Association of Retired Persons (AARP). The AARP national survey of RM shoppers in the U.S. in 2006 showed that despite the high costs involved, 14% of respondents had looked into a RM scheme because they want to make investments or purchase annuities or long-term health care insurance (AARP, 2006).

Wealth

The evidence shows that the wealth was inversely proportional to the willingness to apply for RM. One would expect that homeowners who are more satisfied with their wealth may have more financial reserve for retirement and consequently reduce the demand for RM. The result is similar to Weinrobe's (1987) and Chou's (2006) findings, in which they indicated that the income variable and the value of financial assets had a negative effect on RM. However, the variables of income and house price are not significant in this study.

Bequest

While considering the reason not to apply for RM, respondents' desire to preserve their house as bequest for their children was ranked the first place. The empirical results also revealed the negative relation between the bequest variable and the demand of the RM. Furthermore, based on the survey by the AARP in 1990, the lesser the commitment to bequeath their houses to their children, the more likelihood of applying for RM may take place (Merrill & Finkel & Kutty, 1994). The result may be attributed to the traditional Chinese concept regarding real property, which may also be a hurdle for middle-aged homeowners to apply for RM.

Living alone

Analysis points out the respondents who want to live without children after retired are more willing to apply for the RM. It may be explained that some households do not persevere the traditional Chinese concept --- living with their children as the major supporting source. Therefore, they have more financial autonomy in managing their asset and more motivation to apply for RM. This result could also be attributed to the possible reason for households not planning to pass their house to their children.

4.4 Summary

To convince those who were not willing to apply for RM, the current study believes in a basic income and a board understanding of the reverse mortgage scheme will meet the demand of the potential customers.

As the empirical evidence provided in the study, it appears to be that the subjective perceptions were the major factors affecting the willingness to avail of RM due to traditional Chinese values. Many studies have arrived at similar conclusions (Case & Schnare, 1994; Merrill & Finkel & Kutty, 1994; Weinrobe, 1987). Besides, Chou (2006) indicated the possession of stocks or bonds or funds were significantly related to the willingness to consider applying for RM.