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DEPARTMENTS OF FINANCE AND ECONOMICS

THE ECONOMIC IMPLICATIONS OF THE INTRODUCTION OF
REVERSE MORTGAGES INTO CHINA

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Abstract

The major objective of this thesis is to assess the impact of the introduction of reverse mortgages on consumer spending and on monetary transfers between old and young generations in China.

There are several findings. First, monetary support from children to their elder parents accounts for a relatively small percentage of children's income, and the elder parents will likely to transfer a substantial part of reverse mortgage payments to their children. Second, reverse mortgages are likely to boost the spending of both elder and younger generations and increase overall consumer spending significantly. Third, more than 60% of Chinese across all age groups expressed considerable interest in reverse mortgage with highest interests from age group 41-50. Fourth, the implementation of an inheritance tax will increase the willingness of people aged 20-50 to apply for reverse mortgage, but will decrease the willingness of people aged 50 and above to apply.

Overall, the findings suggest that the introduction of reverse mortgages will likely to generate significant social benefits in China.

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Chapter 1: Introduction

Due to the one-child policy and the economic development, the world's most populated country has stepped into an aged society since 1999. The country is on a downhill demographic vehicle in terms of low fertility and rapid aging of baby-boomers. Despite the economic growth in the last 30 years, China's GDP per capita is still ranked 95th worldwide. The country is growing old before it gets rich.

As part of its culture heritage, China has a special Asian responsibility that children should support their elder parents in need when they start to have salaries. However, the one child policy has created a unique 4-2-1 effect, for which a couple have five dependents (one young child and four elder parents). Therefore, many middle and lower income couples are encountering huge financial burdens.

Moreover, the coverage of pension and health care system is far from perfect in China. The concerns on retirement life and health care have translated into a historical high of 54% savings rate. In order to shift away from an export-oriented economy, Chinese government has emphasized the increase of consumer spending as a key objective of its new five-year plan.

Many people have overlooked housing wealth as a determinant of retiree wealth, particularly in the Chinese context. The homeownership rate in China is one of the highest in the world, reaching an amazing 85%. Most wealth of the Chinese elderly is held in terms of property. As many Chinese elder people are rich in home equity and poor in cash, releasing equity in housing may be a natural mechanism to augment retirement income, relieve the financial burden of younger generation, and

boost overall consumer spending.

The purpose of the thesis is to offer tentative answers to the questions: After the introduction of reverse mortgage, what is the cut of financial burden to younger generation? What is the impact to overall consumer spending? If there is increase in spending, what goods and services will people most likely spend on? What are different levels of interests on reverse mortgage in conditions such as implementation of inheritance tax? What are top reasons for “Yes” and “No” to reverse mortgage?

The structure of the paper is as follows: Chapter 2 delivers an overview of China’s aging problem, potential provision of structure of reverse mortgage, risk factors for reverse mortgage, and China’s unique conditions in reverse mortgage introduction. Chapter 3 outlines guiding questions and presents answers based on data analyses.

Chapter 2. The Aging Problem and Reverse Mortgages in China

2.1 The Basics about Reverse Mortgages

Reverse mortgage is a special retirement planning financial tool that allows elder people to unlock their housing equity in the property and continue living in the property. Not like home equity loans, reverse mortgage does not have any income or credit requirements for borrowers, since no monthly payments are needed on the mortgage. Senior citizens can apply for a reverse mortgage on their home, receiving monthly annuity payments and still reside in the property. When the borrower passes away, the ownership of the property transfers to the lender and repays the reverse mortgage automatically.

Reverse mortgages are available in countries such as United States, Japan, France etc., and are usually only available to senior citizens (citizens aged 62 and above for U.S.). The proceeds from reverse mortgage can be received as a lump sum all at once, fixed monthly tenure payments, fixed monthly payments for a set term, as a line of credit, or a combination of these options.

Senior citizens may qualify for reverse mortgage even if owing money on existing home mortgage, but the existing indebtedness should be paid off first either with proceeds from reverse mortgage or money from savings account.

2.2 China's Aging Population and Reverse Mortgages

2.2.1 One-Child Policy and Aging Population

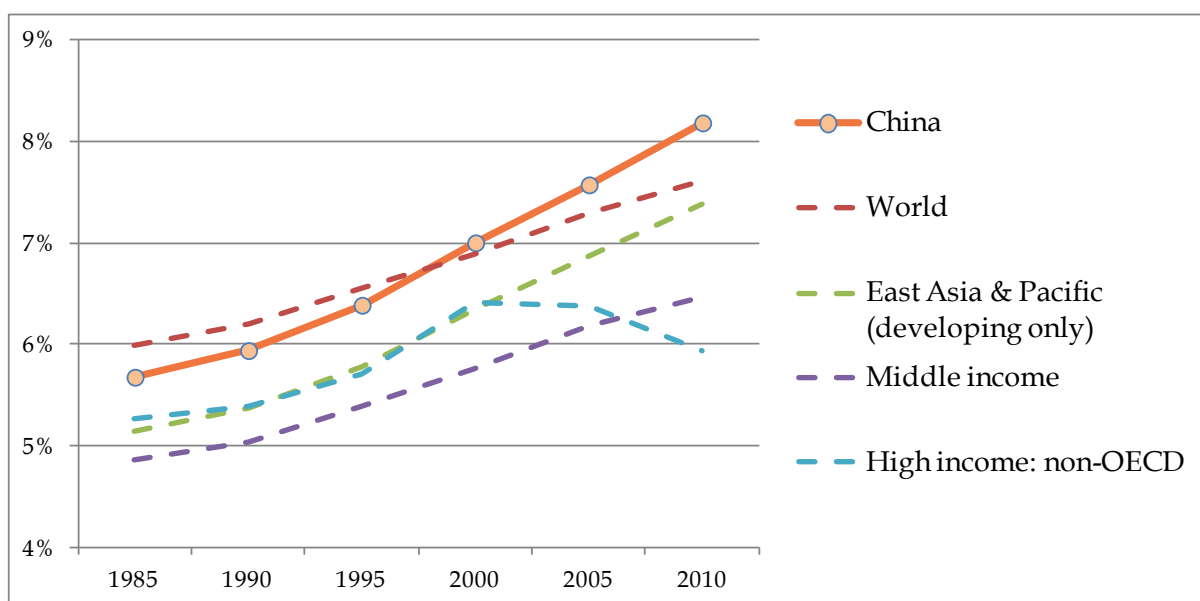
Due to the one-child policy implemented 30 years ago, the population growth in the world most populated country has slowed to 0.48%, which is 45% lower than

that of United States (National Bureau of Statistics). China is on a downhill demographic vehicle in terms of low fertility and rapid aging of baby-boomers. By 2010, China has the largest population of elder people (aged 65 and above) and is one of the fastest aging countries in the world. The 110 million elder people account for 8.19% of China's population, and the percentage is higher than that of middle income countries, developing countries in East Asia & Pacific, and the world average (World Bank). The UN Population Division has projected that by 2030 China's elderly (above the age of 60) will be 24% of the population, reaching a huge number of 360 million (Population Division).

Despite the economic growth in the last 30 years, China's GDP per capita just reached \$7,536 in 2010, which is ranked 95th in the world. The country is growing old before it gets rich.

Chart 1: Population Ages 65 and Above

Source: World Bank



2.2.2 Inadequate Pension & Healthcare System

On the other hand, the pension system and healthcare system in China are far from perfect. The pension system and healthcare systems are separated in urban and rural areas, and the coverage ratio varies significantly in different areas. The household residence system has also limited the ability of the 250 million migrant workers to enroll in the local pension and healthcare systems as local governments only grant enrollment to people with local residence.

By the end of 2011, the largest pension systems in China – Social Endowment Insurance has a balance of RMB 1.92 trillion or USD 305 billion, which is around 4% of China’s 2011 GDP. In contrast, the assets of U.S. social security fund, 401K accounts, and IRA accounts add up to USD 18 trillion, which is about 125% of the GDP of United States.

In a 2012 survey before the opening of the National People’s Congress Conference in China, 89.1% of the 323,077 survey takers answers “unsatisfactory” to the pension systems, 97.3% of the 26,275 samples rated medical care system as unsatisfactory, and 99% of the 26,275 samples think medical services are expensive (Chang).

2.2.3 High Savings Rate and Low Consumer Spending

The concerns regarding the inadequacy of pension systems and healthcare systems have contributed to China’s increasing household saving rate since 1995. The household savings reached 32% of dispensable income and are the main contributors to China’s large national savings of USD 13 trillion (The People's Bank

of China).

Chart 2: Household Savings Rate

Source: Chamon, Liu, and Prasad

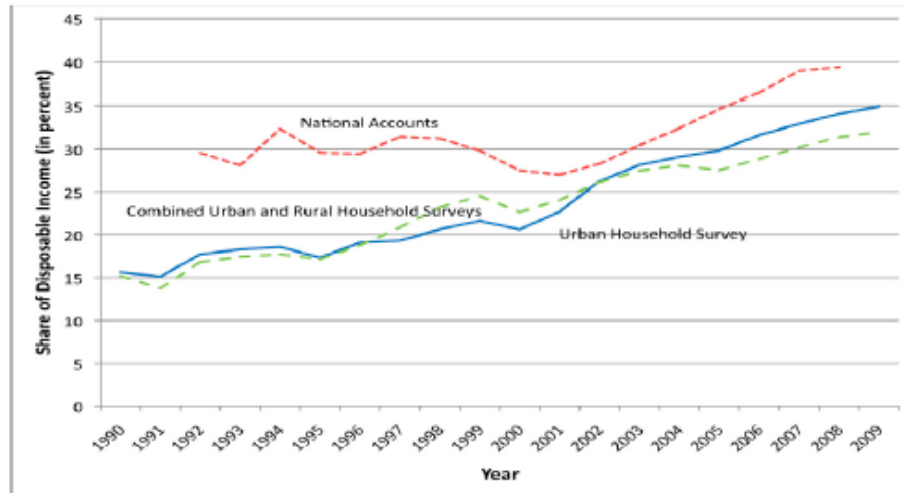
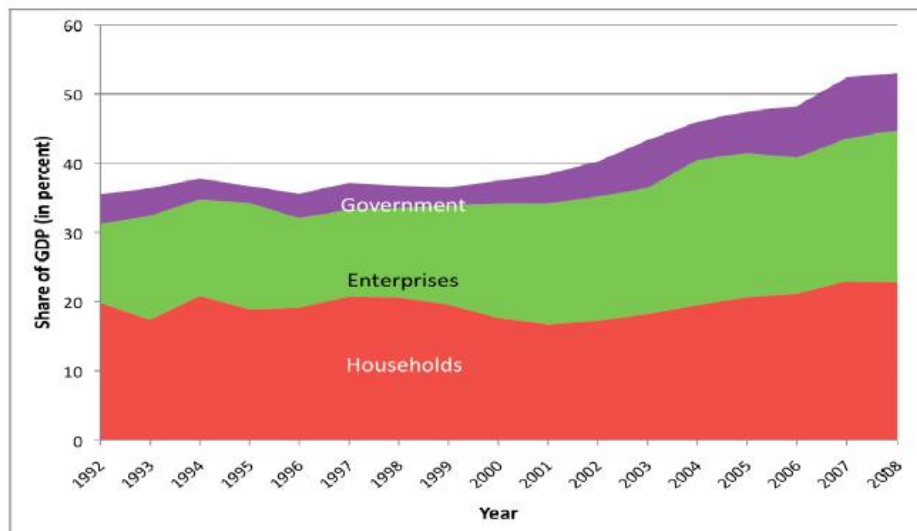


Chart 3: Gross Savings Rate by Sector

Source: Chamon, Liu, and Prasad



As part of its culture heritage, China has a special Asian responsibility that the children should support their elder parents in need when they start to have salaries. However, the one child policy has created a unique 4-2-1 effect, for which a couple have five dependents (one young child and four elder parents). Therefore, many

middle and lower income Chinese couples are encountering huge financial burdens.

The high overall savings rate and younger generation's responsibility towards elder parents have suppressed the spending of both generations, pushing consumer spending in China to a historical low. The consumer spending rate dropped from 53% in 1985 to 35.3% in 2008 (Shang). The imbalance between internal consumption and production has partially contributed to China's huge trade surplus and also the international trade conflicts European Union, United States, and many other countries.

2.2.4 Converting Housing Equity to Current Income

With the problems on aging population, insufficient pension systems and healthcare systems, it has become an imperative issue for Chinese to secure their retirement lives that might last 20 years or longer.

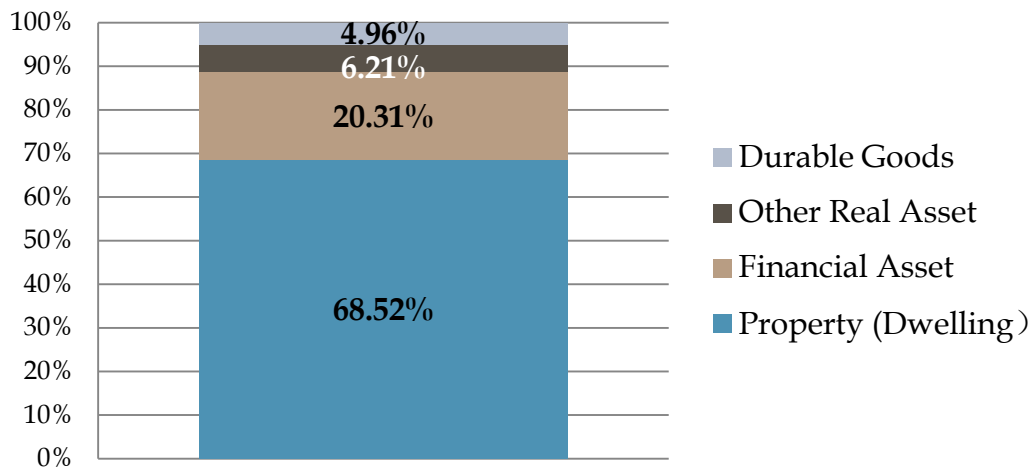
Many people have overlooked housing wealth as a determinant of retiree wealth, particularly in the Chinese context. The homeownership rate in China is one of the highest in the world, reaching an amazing 87.8% (Yang). In a 2011 survey on family wealth, dwelling property accounted for 68.52% of the total family wealth of a typical Chinese family (The China Center for Financial Research, Tsinghua University). The age groups 50 years old and above accounted for 27% of the Chinese population, yet possessing 56% of the total social wealth. Most wealth of the Chinese elderly is held in terms of property. If the housing wealth can be utilized properly, it could potentially be a major contributor to the development of economy.

As many Chinese elder people are rich in home equity and poor in cash,

releasing equity in housing through reverse mortgage may be a natural mechanism to augment retirement income and boost consumer spending in China.

Chart 4: Breakdown of Family Wealth in China

Source: The China Center for Financial Research, Tsinghua University



2.3 Possible Structure of Reverse Mortgage Provision

2.3.1 Government Support

As reverse mortgage has significant benefit to the social wellbeing, it is usually administered and supported by government entities in many countries. In the Chinese context, such programs will require collaboration from National Development and Regulatory Commission, China Banking Regulatory Commission, Social Security Fund, and the China Insurance Regulatory Commission. These government entities would play an important role in chartering and coordinating the reverse mortgage program, providing tax benefits to the industry, educating citizens on reverse mortgage, creating mortgage insurance scheme, and regulating the market.

2.3.2 Collaboration between Financial Entities

In order to utilize the advantages of each financial entity, the structure of reverse mortgage provision in China should be based on the collaboration between banks, insurance companies, and the national social security fund.

The reverse mortgage origination will involve loan origination, credit assessment, and home appraisal; which are within the daily operations of banks. In addition, the wide-spread branches also make banks perfect windows for reverse mortgage customers.

The insurance companies would be able to utilize rich experience on developing life insurance products to devise reverse mortgage products. The long maturity of insurance companies' capital also matches perfectly with the capital needs of reverse mortgage.

The introduction of reverse mortgage might also provide a great opportunity for China's social security fund to better invest its capital with long maturity. The 2 trillion national pension funds earned a nominal return of less than 2% last year by putting most of the money in bank account, while the inflation rate reached 5.5%.

As a government entity, the social security fund could be the first to test drive the reverse mortgage program. The involvement of national pension funds in reverse mortgage financing could not only earn a higher return for asset under management, but also reduce the public pension liability and mitigate the demand for long-term care facilities in China. It will also reinforce the provision of social welfare – an important mission of the nation pension fund.

Therefore, collaboration of the three financial entities on the reverse mortgage program will be a good way to share the merits of each member, and minimizing the hardship of initial introduction.

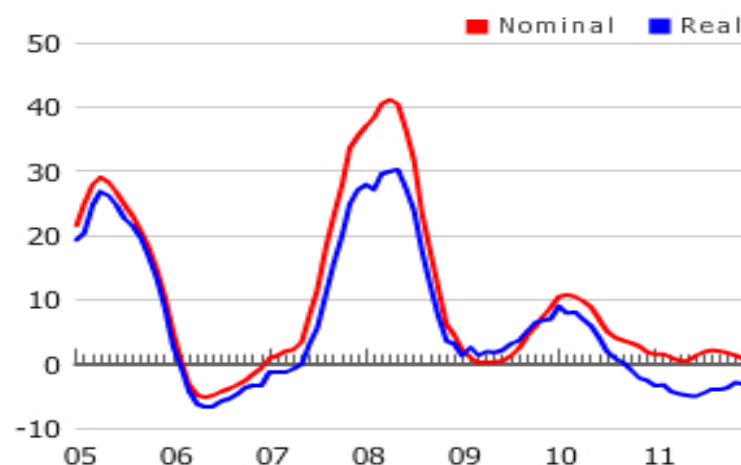
2.4 Impact of Economic and Loan Factors to Reverse Mortgage

2.4.1 Housing-Price Risk

The fluctuation of housing price will affect the recovery amount that the lender receives on terminations of the reverse mortgage and the possibility of the borrowers to refinance. After the overheat in the past years, the housing price in China started to decline due to increasing regulations on housing speculation and tightening of monetary policy. The projection on Chinese housing price has been difficult as it does not conform to the models that relate housing price to income level.

Chart 5: China Housing Price Percentage Change

Source: Global Property Guide



Therefore, it is necessary for government authorities to lead the process of creating insurance on the value of collateralized homes in reverse mortgage portfolios. The mortgage insurance premium could be charged annually to the

borrower over the life of the loan. In this way, the risk on housing price fluctuation can be hedged.

2.4.2 Mortality-Rate Risk

The mortality rates could impact the reverse mortgage substantially due to the borrower's death and the termination of the loan. First of all, the moral hazard of borrowers implies that elder people that expect to live longer will be more willing to apply for a tenure payment reverse mortgage than those in bad health. Therefore, the expected life span in lender's projection might be shorter than that in actual situation. Second, the lengthy term of reverse mortgage makes it possible for substantial breakthrough in medical science, which might prolong the life span of human beings.

The unexpected extension of life span will increase the payments from lenders and delay the recovery of loan, causing loss to lenders. Therefore, it will be wise for lenders to be conservative and leave a buffer space in estimating the life span of borrowers.

2.4.3 Interest-Rate Risk

As the interest rate of tenure reverse mortgage is usually fixed, the case of surging interest rates will increase the cost of capital of lender, increasing its exposure to interest rate risk. Empirically, inflation is not unusual in the developing process of developing countries such as China. In the year of 2011, the central bank of China hiked interest rate three times to fight hiking inflation. In such economic conditions, lenders might lose money on reverse mortgage portfolios due to

borrowing high and lending low.

However, lenders can hedge interest risk via financial tools such as interest rate swaps. In 2006, the People's Bank of China allowed the practice of interest rate swaps in China, making it possible for lenders to avoid incurring loss due to interest rate fluctuation.

2.5 Special Conditions in China

2.5.1 The 70-year Term for Land Usage

By now, all land resources in China are state-owned, only rights to use the land but not ownership can be granted. According to the article twelve of the "Interim Regulations of the People's Republic of China Concerning the Assignment and Transfer of the Right to the Use of State-Owned Land in Urban Areas" published by the State Council in 1990, the maximum term with respect to the assigned right to the use of the land for residential purposes is 70 years (Ministry of Land and Resources). There have always been ongoing concerns that the government will resume the land after the 70-year period expires. This might impede the introduction to reverse mortgage as lenders would assume huge risk of losing the collateralized property within the term of the reverse mortgage.

In 2007, the Chinese President Hu Jintao signed the "Real Right Law of the People's Republic of China". The article 149 of the law stated that when the term of the right to use land for residential purposes expires, it shall be renewed automatically (Xinhua News Agency). The new legislation provided clear and strong support for citizens' continuing right to use the land. However, the law did not

include important details such as if there will be any charge for the automatic renewal.

Without the details for implementation, the practice of renewal and extension are in trouble. Two cases regarding the renewal and extension of the land usage right might be representative of the situation. The first case was about the Alishan residential community in Qingdao, which was built in 1989, just one year before the state council's publication of the interim regulation. The term of the right to use the land was set to be 20 years as no applicable regulations exist at the time. By 2009, the term of the right expires and one homeowner Mr. Zeng was able to extend the term of the right from 20 years to 50 years without any charge and received proper documentations (Han). The second case happened in Shenzhen, where the local government announced in 2004 that the right to use commercial land can be renewed at a price that is 35% of the original price for which the right was granted (Liu). So the cases might imply that the renewal of residential land will be free of charges while renewal of commercial land will incur charges.

The main stream also suggests that there will only be low charges or even no charges at all. As during the legislation process, the "application required for renewal" in third draft was changed to "automatic renewal" in fourth draft, and the content regarding charges for automatic renewal in the third draft was deleted in the published law (Han). It is not hard to sense that the legislation process is gradually leaning towards no charges and easier renewal.

2.5.2 Tradition of Leaving Property to Children

It is a usual idea for many Chinese to leave the property to children or other heirs after death. The prevalence of this idea will limit the percentage of elder people applying for reverse mortgage. However, as the percentage of elder people with multiple properties grows, taking out reverse mortgage on one of the properties and leaving the rest properties to children will be an acceptable balance between the traditional idea and the existing needs.

Chapter 3. Survey and Results

3.1 Research Methodology

In order to collect first-hand data to estimate the demand for reverse mortgage, a survey was conducted from June to August 2011 in China regarding people's attitude towards reverse mortgage, the intergeneration financial relationship, the consequential consumer behavior after receiving reverse mortgage payments, and the change of people's interests towards reverse mortgage in case of the implementation of inheritance tax or line of credit payment option. The survey consists of 22 questions and was conducted in forms of both paper and online questionnaires to eliminate the bias of not including people that cannot use computer. A copy of the survey questionnaire can be found in the appendix A.

The survey also includes a reverse mortgage payment table, from which survey takers can get the estimated reverse mortgage monthly payments according to home value and the age reverse mortgage starts. The payment was calculated as follows:

1. Principal Limit

$$\textit{Principal limit} = \textit{Home Value} * \textit{Principal Limit Factor}$$

Principal limit factor is applied to adjust the maximum loan amount according to the age of the youngest borrower and the expected interest rate on mortgage. These factors are determined actuarially. The older the borrower, the higher percentage of principal limit can be obtained through a reverse mortgage; the higher the expected mortgage interest rate, the lower the principal limit factor (U.S. Department of Housing and Urban Development).

The 2009 principal limit factors were used as a proxy to calculate the principal limit in Chinese condition. The principal limit factors used were obtained through a Freedom of Information Act Request to the U.S. Department of Housing and Urban Development (HUD). According to the written response from the HUD, the original factors were used through September 2009. The latest 2011 principal limit factors are not adopted as a substantial adjustment was made after 2009 due to the burst of housing bubble.

2. Service Fee Set Aside

$$\text{Servicing fee set aside} = \text{Fee} \times [(1+i)^{(m+1)} - (1+i)] / [i \times (1+i)^m]$$

Where “i” is the monthly compounding interest calculated as one twelfth of the sum of the expected average mortgage rate and the annual mortgage insurance premium rate. “m” is the number of remaining months that the servicing fee could be collected. Fee is the monthly loan servicing fee charged to the borrower's account.

$$i = (\text{expected average mortgage rate} + \text{mortgage insurance premium rate})/12$$

$$m = 12 \times (91 - \text{borrower's age at the initiation of loan})$$

The formula established by HUD uses 100 as the actuarially risk-adjusted life span of Americans to calculate “m”. As the life span of Chinese is 5 years shorter than Americans, the number in China context is reduced to 91 to reflect the shorter life span and provide more buffer for higher risks mentioned in chapter 2.

3. Net Principal Limit

$$\text{NPL} = \text{Principal limit} - \text{Servicing fee set aside}$$

4. Scheduled Monthly Payments

$$P = NPL \times (1 + i)^m \times i / [(1 + i)^{m-1} - (1 + i)]$$

In the calculation, the expected interest rate is assumed to be 6.49%, close to the base lending rate set by the People's Bank of China for all loans with maturity longer than five years. The annual mortgage insurance premium is assumed to be 0.25% and the monthly loan servicing fee charged to the borrower's account is assumed to be RMB 30.

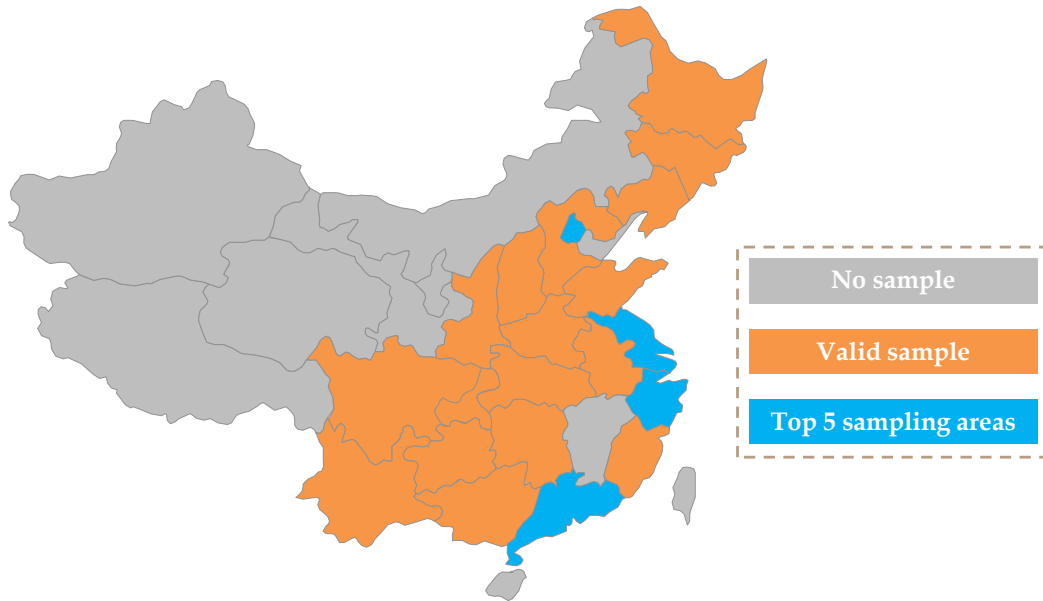
3.2 Respondents Background Characteristics

3.2.1 Geographic and Age Distribution

In total, 1053 valid samples have been collected, with more than 60% of the samples from paper questionnaires. Survey takers come from 23 provinces and province-level municipalities in China, with most samples from Zhejiang, Shanghai, Beijing, Guangdong and Jiangsu. The five provinces and cities are among the most economically developed areas in China, and also have the highest percentage of elder population. These top five sampled provinces potentially have a higher possibility to embrace the reverse mortgage early. A map about the geographic distribution of samples can be found in the next page.

Chart 6: Survey Takers Geographic Distribution

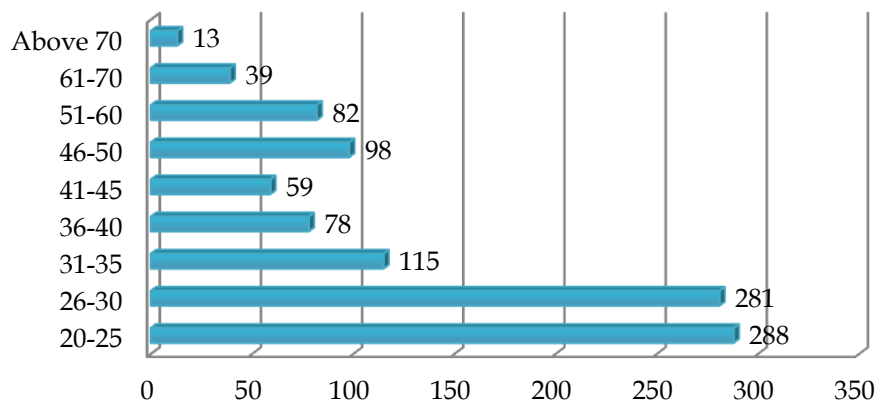
Source: 2011 Reverse Mortgage Survey Data



Among the survey takers, 291 of them are above 40 years old, accounting for 28% of the sample. Another 762 survey takers are from 20 to 40 years old, these age groups are surveyed mostly to observe the trend of attitude towards reverse mortgage and the consumer behavior in the next 15-30 years. The specific age group breakdown is illustrated in the graph below.

Chart 7: Number of Samples in Age Groups

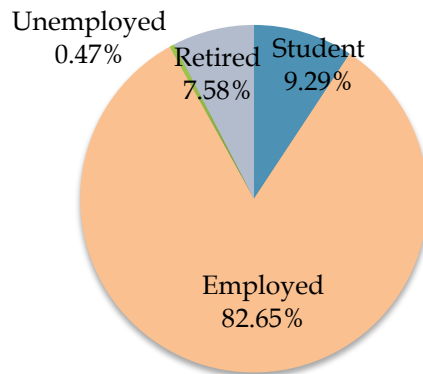
Source: 2011 Reverse Mortgage Survey Data



The breakdown of sex of survey takers are almost 50:50, with most of them employed. A detailed chart on the employment status is attached below.

Chart 8: Survey Takers Employment Status

Source: 2011 Reverse Mortgage Survey Data



3.2.2 Enrollment in Pension System and Healthcare System

There are currently four major pension systems in China, the social endowment insurance (similar to 401k in U.S.), the subsistence security system (similar to social security in U.S.), the government unit pension system (only available to government workers), and commercial pension insurance available for purchase. For age groups 20-40, about 63% of the survey takers are covered by the social endowment insurance, 12.6% are enrolled in the government unit pension system, and 10.51% not enrolled in any pension system. For age groups 40 and above, the percentage of people enrolled in social endowment insurance is close to that in the younger age groups, while the percentage covered by government unit pension system more than doubled. The proportion of people not enrolled in any pension system dropped to 0.95%. It is worth noted that subsistence security system only accounted for a very

small percentage, potentially due to the relatively high income of the samples. Two pie charts illustrating detailed percentage breakdown is attached below.

Chart 9: Pension System Enrollment (Age groups 20-40)

Source: 2011 Reverse Mortgage Survey Data

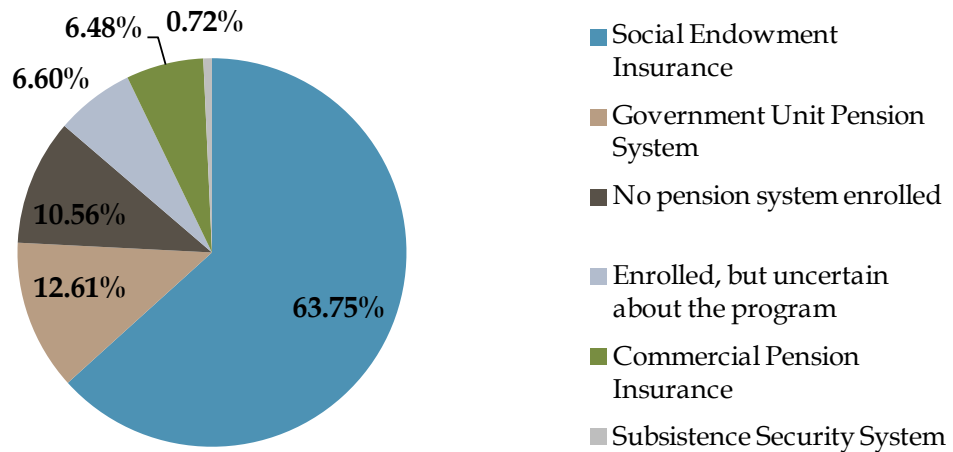
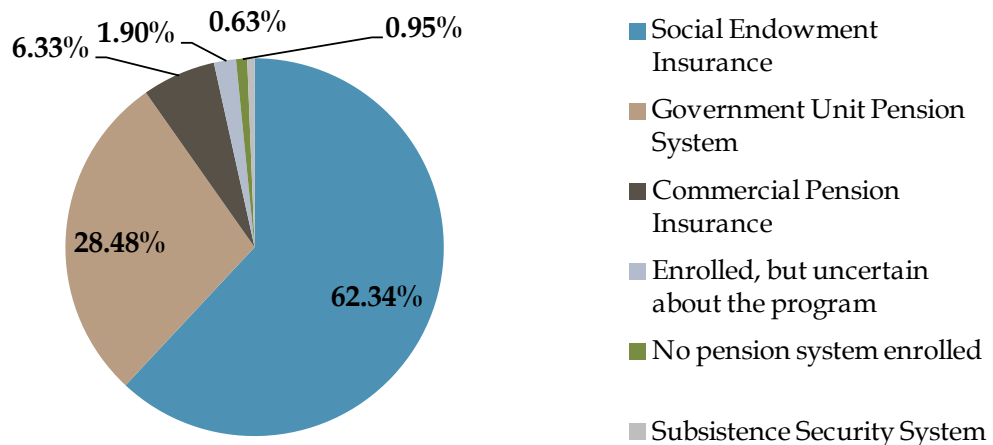


Chart 10: Pension System Enrollment (Age groups 40 and above)

Source: 2011 Reverse Mortgage Survey Data

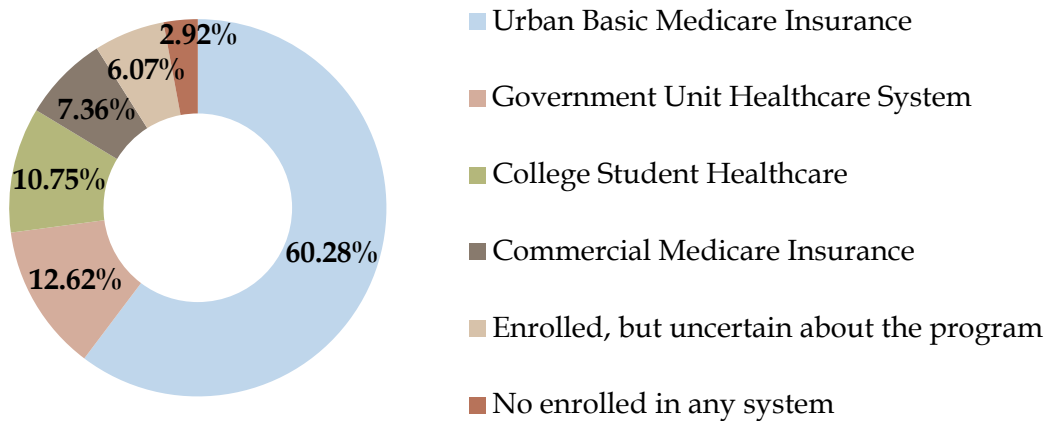


The healthcare system in China primarily consists of urban basic medical insurance, government unit healthcare system (only available to government workers), college student healthcare, and commercial medical insurance available for purchase. For age groups 20-40, about 60% of the samples are enrolled in urban

basic medical insurance, 12.6% are covered by government unit healthcare, and another 10.75% covered by college student healthcare.

Chart 11: Healthcare System Enrollment (Age groups 20-40)

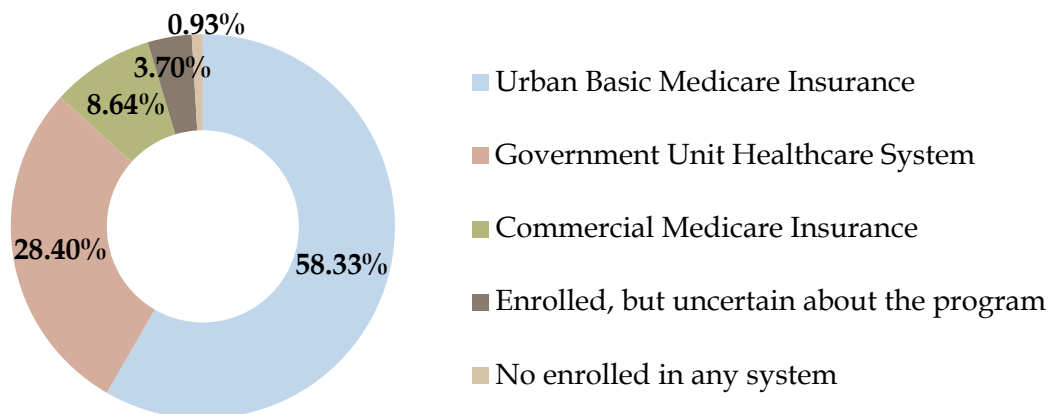
Source: 2011 Reverse Mortgage Survey Data



For age groups 40 and above, the urban basic medical insurance still dominate the largest proportion of 58.3%, while the government unit healthcare make up 28.4%. Around 8.64% of the samples have purchased commercial medical insurance, and only 0.93% is not enrolled in any healthcare system.

Chart 12: Healthcare System Enrollment (Age groups 40 and above)

Source: 2011 Reverse Mortgage Survey Data

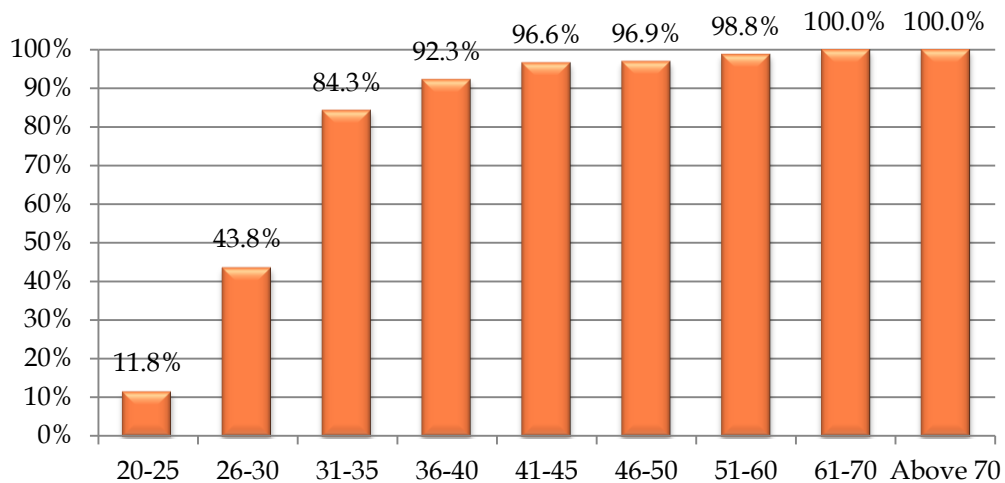


3.2.3 Homeownership Rate

According to a national survey done by Chinese National Bureau of Statistics, the overall homeownership rate in China is 85%, one of the highest in the world. Among the 1053 survey takers, the homeownership rate starts with 11.8% at the age group 20-25 and climbs to around 90% when people enter their thirties and fourth. This result is in line with both the national survey and the specific situation in China, as most Chinese purchase home before getting married. The people aged 20-40 own an average of 0.614 properties, and the people aged 40 and above on average own 1.89 properties.

Chart 13: Homeownership Rate across Age Groups

Source: 2011 Reverse Mortgage Survey Data



3.3 Demand for Reverse Mortgage

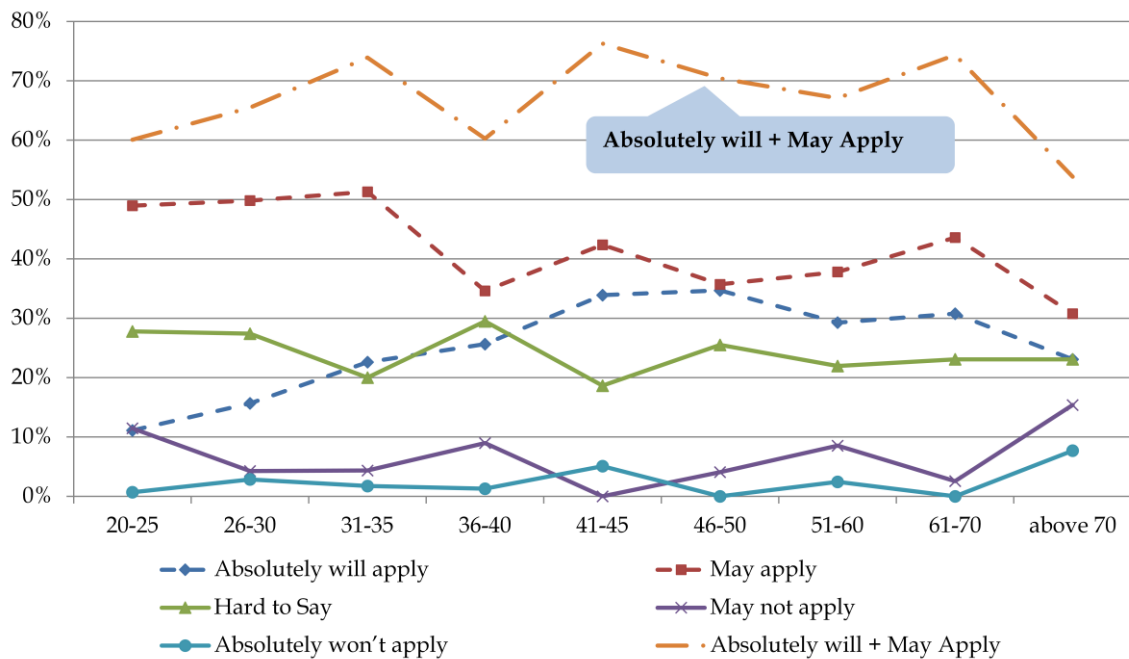
3.3.1 Willingness to Apply for a Reverse Mortgage

The survey finds that Chinese people across most age groups have strong interests in applying reverse mortgage. As can be seen in the graphs below, a very

large proportion of survey takers chose “Absolutely will apply” or “May apply” across all age groups, the highest percentages were observed in age groups 41-45 and 61-70, which are 76.27% and 74.37% respectively. The percentage of people choosing “Absolutely will apply” also reached a relatively high level, peaking at 34.7% for age groups 46-50. It is notable that citizens aged 70 and above have lower interests to apply for reverse mortgage, which are possibly due to their decreasing willingness to accept innovative financial products.

Chart 14: Willingness to Apply for a Reverse Mortgage in the Future

Source: 2011 Reverse Mortgage Survey Data



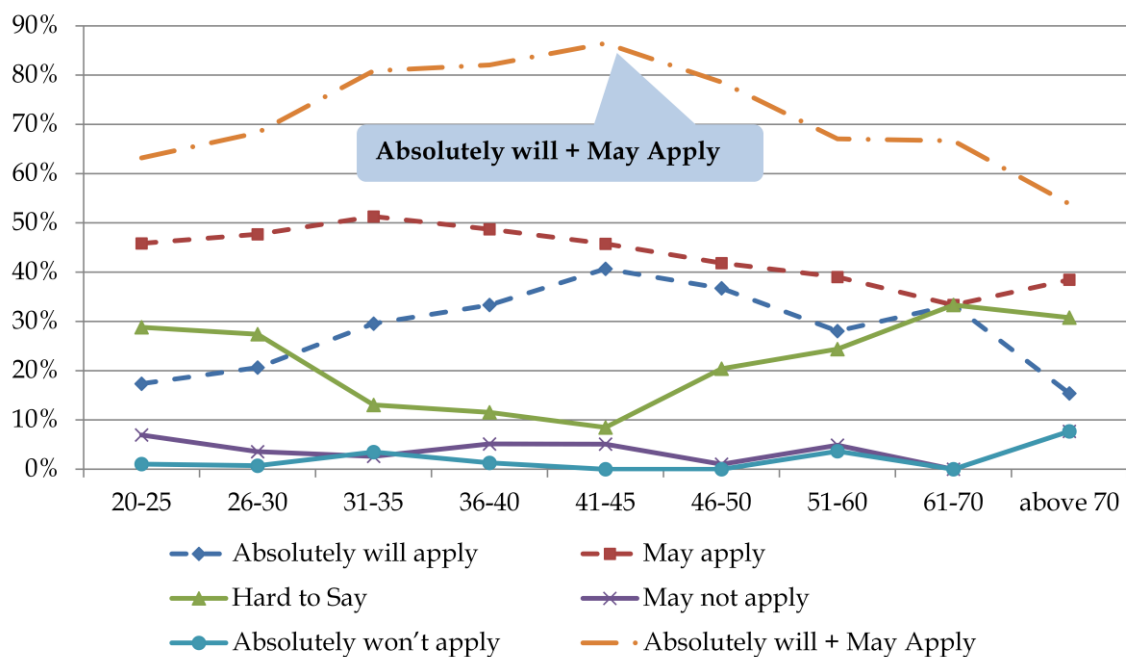
3.3.2 The Impact of Inheritance Tax on Demand for Reverse Mortgage

Although inheritance tax is currently not levied in mainland China, it is on the legislation timetable and is likely to be implemented in the near future. The survey finds that the implementation of inheritance tax will increase the willingness of people aged 20-50 to apply for reverse mortgage, but meanwhile decrease the

willingness of people aged 50 and above to apply. This observation might be explained by the fact if a percentage of the inheritance will be taxed, elder people will tend to leave more wealth in order to maintain the amount of wealth left to their heirs.

Chart 15: The Impact of Inheritance Tax on Demand for Reverse Mortgage

Source: 2011 Reverse Mortgage Survey Data



3.3.3 The Impact of Line of Credit on Demand for Reverse Mortgage

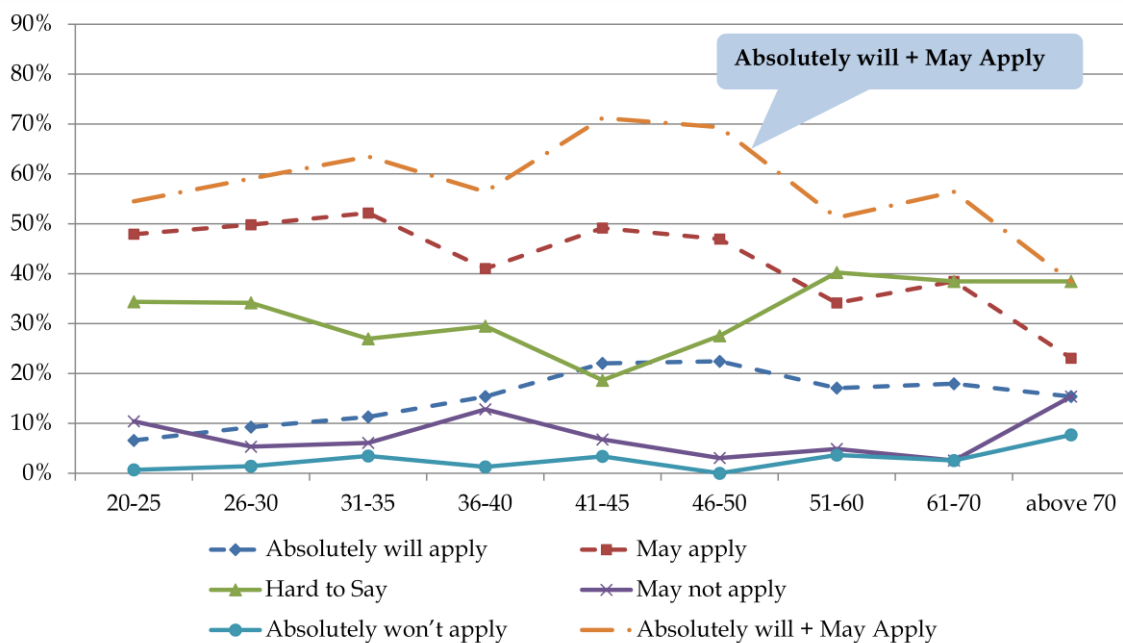
As introduced before, the proceeds of reverse mortgage can be received as a line of credit. This option will grant a line of credit equal to 50-60% of the home value if the reverse mortgage starts at the age of 60. Borrowers can withdraw any capital within the credit line at any time, and only the capital withdrawn incurs interests. The capital not withdrawn will grow at an interest rate that is slightly lower than the base lending rate.

According to survey data, the line of credit payment option will generally

decrease Chinese people's interest to apply for reverse mortgage and increase their uncertainty in decision to apply. While line of credit option is the most popular payment plan of reverse mortgage in United States, it might be too early for Chinese to fully understand this option. Some of the survey takers might have paid much attention to the nominal discount on home value, but omitting the growing prospect of the line of credit and the convenient withdrawal as a perfect option to fight against contingencies.

Chart 16: The Impact of Line of Credit on Demand for Reverse Mortgage

Source: 2011 Reverse Mortgage Survey Data



3.3.4 Top Reasons if Not Wish to Apply

As can be seen from the two graphs below, the top reasons of not wishing to apply for reverse mortgage are leaving property to children, sufficient retirement income, sufficient savings accumulated, and limited understanding to reverse mortgage. The choices are identical between age groups 20-40 and age groups 40 and

above. It implies that the traditional idea of leaving property to children took strong root in China in both younger and elder generations, and might remain in a considerable period of time. On the other hand, as reverse mortgage is still new to most Chinese people, education and consultation will be crucial at the introductory stage of reverse mortgage.

Chart 17: Top Reasons if Not Wish to Apply (Age groups 20-40)

Source: 2011 Reverse Mortgage Survey Data

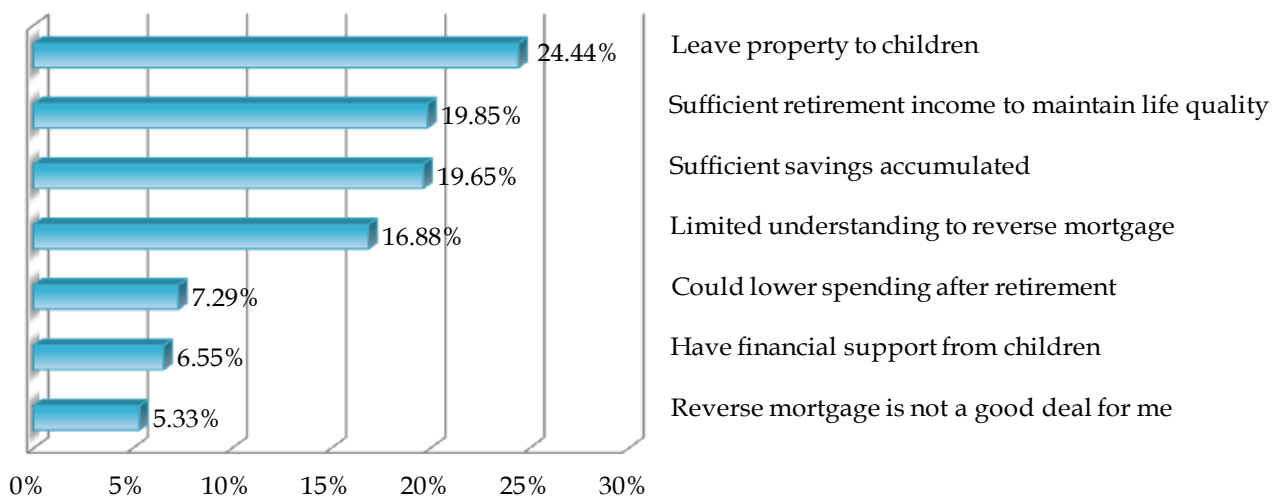
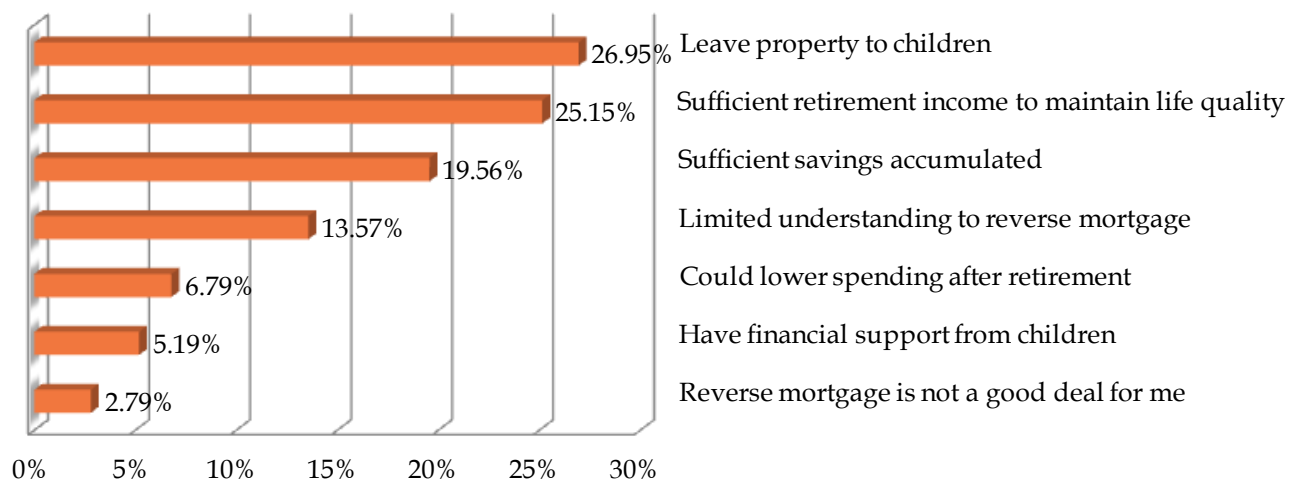


Chart 18: Top Reasons if Not Wish to Apply (Age groups 40 and above)

Source: 2011 Reverse Mortgage Survey Data



3.3.5 Top Reasons if Wish to Apply

The top three reasons of wishing to apply for reverse mortgage are among avoid increasing financial burden to children, have several properties, and maintain high life quality after retirement. As illustrated by the two graphs below, the ranking of other reasons are slightly different between age groups 20-40 and age groups 40 and above. The elder age groups have a higher ranking for paying for medical expenses and increase monetary support to children and grandchildren, while the younger generation more to spend the wealth built up by their own.

Chart 19: Top Reasons if Wish to Apply (Age groups 20-40)

Source: 2011 Reverse Mortgage Survey Data

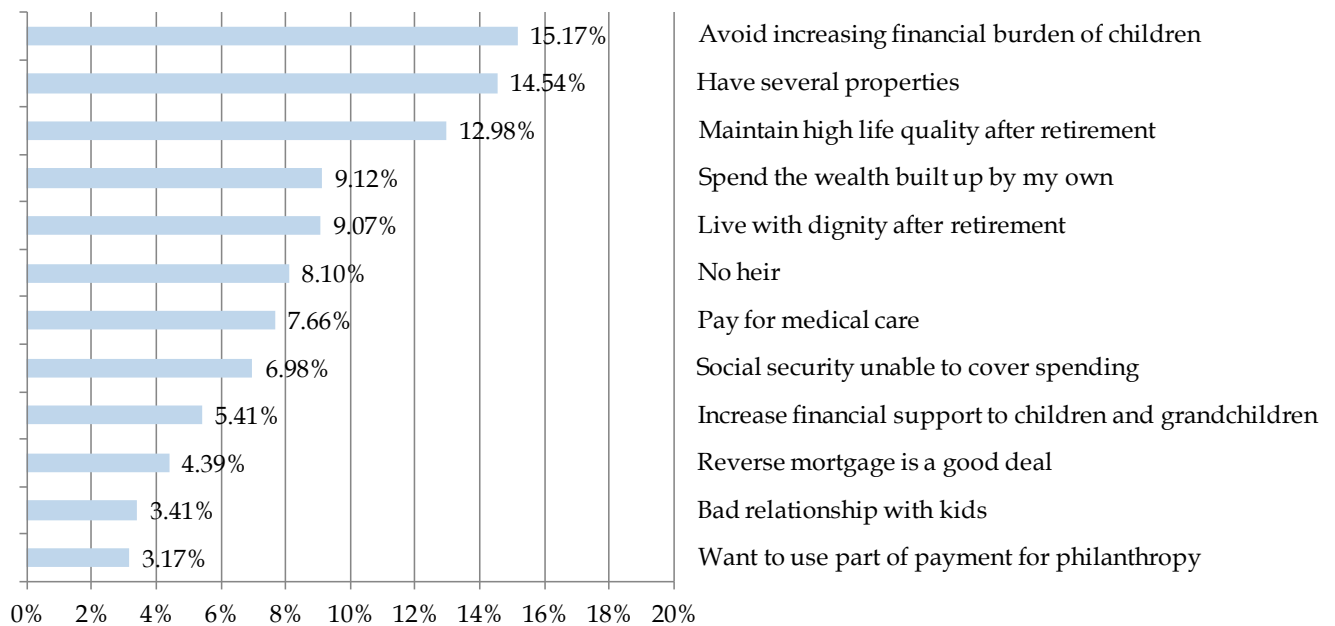
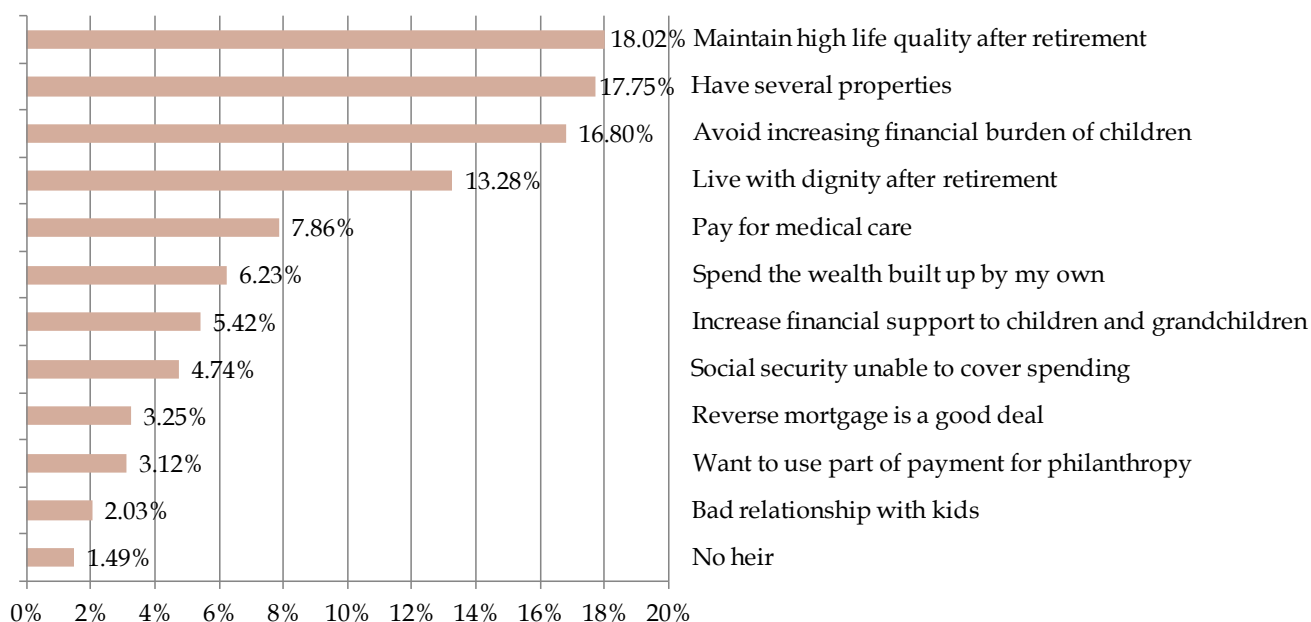


Chart 20: Top Reasons if Wish to Apply (Age groups 40 and above)

Source: 2011 Reverse Mortgage Survey Data



3.4 Implications for Intergeneration Transfers and Spending

3.4.1 Income and Monetary Support from Children

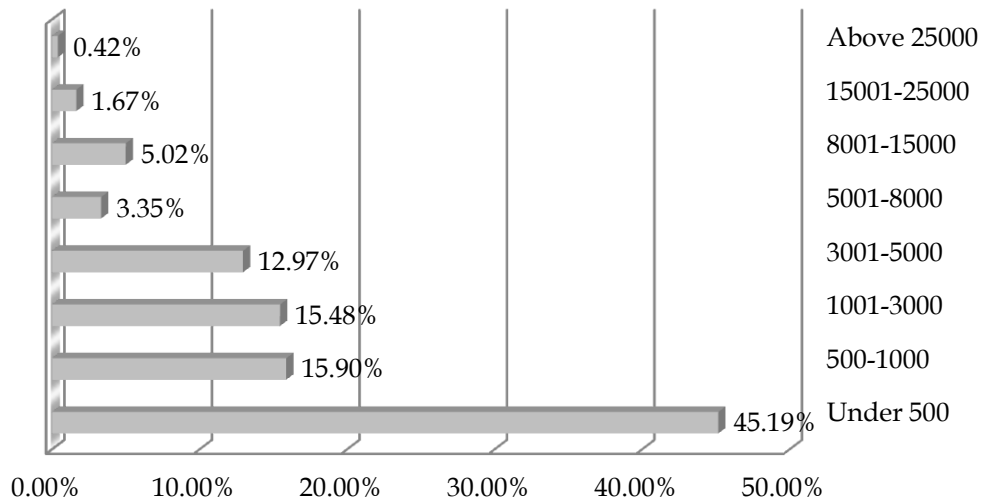
The survey takers aged 20-40 on average have a monthly income of RMB 4,173 or USD 663, while samples aged 40 and above have a higher average monthly income of RMB 6,988 or USD 1,110. Overall, the weighted average monthly income of all survey takers is RMB 4,943 or USD 785. Generally, the average income of the survey takers is much higher than the national average as most samples are collected in economically developed areas with high salaries levels.

As introduced before, Chinese children usually start to support their elder parents in need when they have salaries. According to the survey, the amount of money from children to those elder parents who receive supports is RMB 2,358 or

USD 374 per year. It is about 3.87% of the annual income of the younger generation, or 46.5% of their income in a month. The amount of support is

Chart 21: Annual Monetary Support from Children in RMB

Source: 2011 Reverse Mortgage Survey Data



3.4.2 Willingness to Decrease Monetary Support

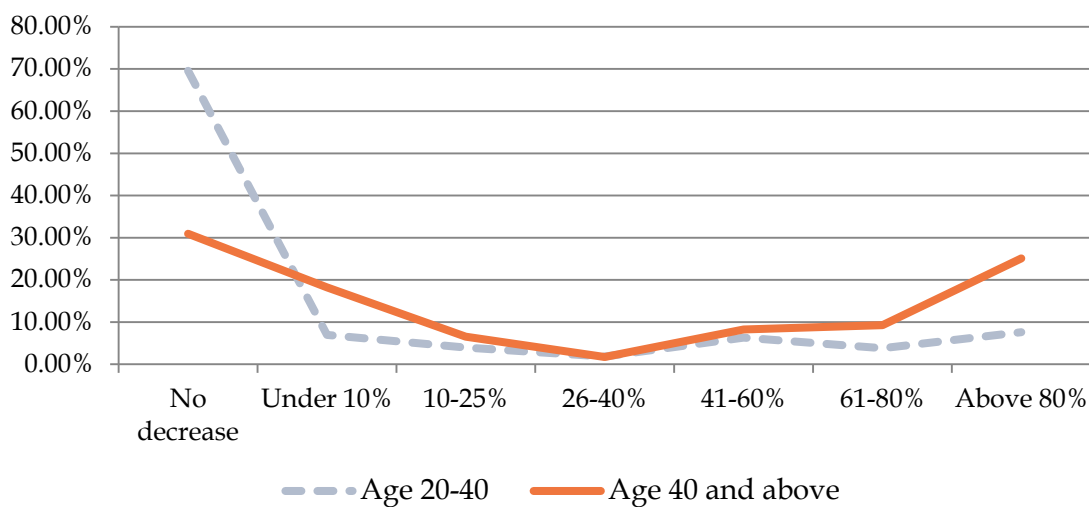
After receiving reverse mortgage, it might be a reasonable decision for elder people to decrease the monetary support from children. It is worth noting that younger people and older people have significant difference on this question. The age groups 20-40 choose to decrease the monetary support from children by 14.36% after receiving reverse mortgage payments, while people aged 40 and above expect to decrease the support amount by 36%.

The 36% decrease represents an RMB 849 cut of monetary support, equal to 1.4% of the children’s annual income. From the data, it might be easy to conclude that the cut in support has little impact to the financial positions of the children. However, since the children will usually need to pay for contingencies such as serious illness of

elder parents, the reverse mortgage payments the elder people receive might relieve the children from having to pay this contingencies. Consequently, the younger generation might be able to change their savings ratio and spend more due to their elder parents taking out reverse mortgage.

Chart 22: Percentage of Decrease in Monetary Support after RM Payment

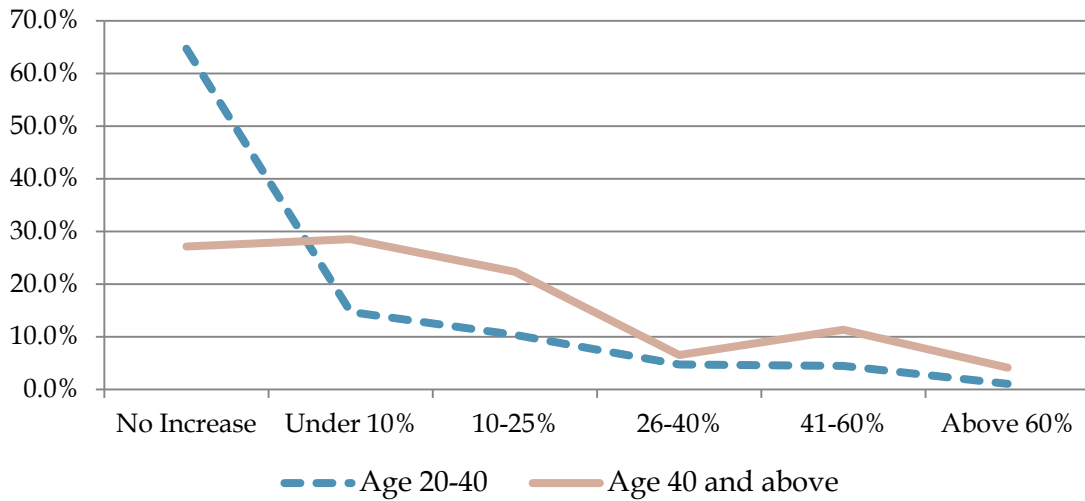
Source: 2011 Reverse Mortgage Survey Data



After receiving reverse mortgage, it might also be the case that some of the elder people will consider giving money to children or grandchildren as their own life improves. However, it seems that both younger and older people wish to keep most of their reverse mortgage payment in their own pocket. The age groups 20-40 choose to give about 7.2% of their reverse mortgage payment to their children or grandchildren. People aged 40 and above decide to transfer 16.5% of their payment to the younger generation, which is a substantial part of their payment and might increase the monthly income of their children by more than 20%.

Chart 23: Percentage of RM Payment Giving to Children or Grandchildren

Source: 2011 Reverse Mortgage Survey Data



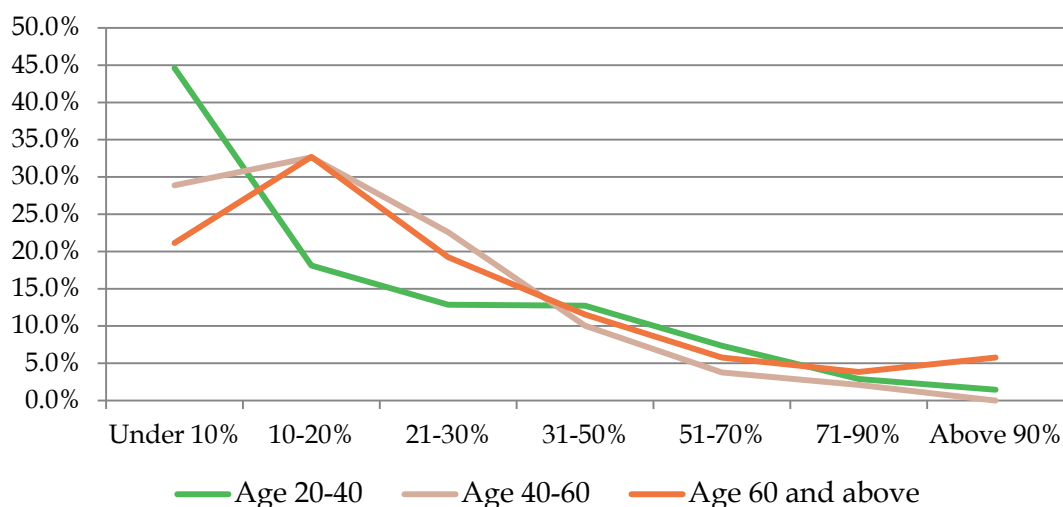
The difference in the willingness to decrease monetary support from children and giving money to children or grandchildren suggests that the current elder generation is more willing to relieve their children from financial burdens after receiving reverse mortgage payments.

3.4.3 Percentage of Income Saved in Bank Account

According to the survey, the percentage of income people save in bank account is 21.49%. In order to verify the validity of the survey, the following data was retrieved from People’s Bank of China and National Bureau of Statistics. In 2011, the household deposit increased RMB 3965.5 billion. The 669,192,563 urban populations have a disposable income of RMB 21,810, while the 670,532,288 rural populations have a disposable income of RMB 6977. By dividing the increase in household deposit with total disposable income, the percentage is 20.57%, which is close to the survey data.

Chart 24: Percentage of Income Saved in Bank Account

Source: 2011 Reverse Mortgage Survey Data



3.4.4 Impact on Consumer Spending

In the survey questionnaire, supposing wishes to take out a reverse mortgage, participants are asked to choose their reverse mortgage payment according to the table attached below. For those who might qualify for reverse mortgage (aged 60 and above), the average monthly reverse mortgage payments they could receive is RMB 6,320 or USD 1,004. The additional reverse mortgage payments will almost double elder people's current monthly income of RMB 6,644.

The samples aged 60 and above on average have 1.69 children. With data retrieved from National Bureau of Statistics and the reverse mortgage survey, the sensitivity analysis shows that the consumer spending could increase RMB 150.8 billion annually if 2% of the elder citizens (aged 60 and above) take out reverse mortgage. The increase in spending could add up to RMB 452.3 billion if 6% of elder people enrolled, and RMB 753.8 billion if 10% enrolled. The detailed calculation of the consumer spending impact is attached in next page.

Table 1: Sensitivity Analysis on Consumer Spending Impact

Source: National Bureau of Statistics, 2011 Reverse Mortgage Survey Data

Percentage of elder people take out RM	2%	4%	6%	8%	10%
Increased spending of elder people (Billion)	87.8	175.6	263.4	351.1	438.9
Increased spending of children (Billion)	63.0	126.0	188.9	251.9	314.9
Total consumer spending increase (Billion)	150.8	301.5	452.3	603.1	753.8

Chart 25: Reverse Mortgage Monthly Payment Table

Source: U.S. Department of Housing and Urban Development

		Reverse Mortgage Monthly Payment Table							
		Property Value in Chinese Yuan							
		¥ 500,000	¥ 1,000,000	¥ 1,500,000	¥ 2,000,000	¥ 2,500,000	¥ 3,000,000	¥ 3,500,000	¥ 4,000,000
	60	1,556	3,142	4,728	6,314	7,900	9,486	11,072	12,658
	61	1,598	3,226	4,854	6,483	8,111	9,739	11,367	12,996
	62	1,645	3,321	4,997	6,673	8,348	10,024	11,700	13,376
	63	1,699	3,428	5,156	6,885	8,614	10,343	12,072	13,801
	64	1,755	3,539	5,324	7,109	8,894	10,679	12,464	14,249
	65	1,814	3,658	5,502	7,346	9,190	11,034	12,878	14,722
	66	1,876	3,783	5,690	7,596	9,503	11,409	13,316	15,223
	67	1,946	3,923	5,900	7,877	9,854	11,831	13,807	15,784
	68	2,021	4,073	6,125	8,177	10,228	12,280	14,332	16,383
	69	2,098	4,226	6,355	8,483	10,612	12,740	14,868	16,997
Age Reverse Mortgage Starts	70	2,184	4,399	6,614	8,829	11,044	13,259	15,474	17,689
	71	2,278	4,587	6,895	9,204	11,513	13,821	16,130	18,439
	72	2,384	4,799	7,214	9,629	12,044	14,458	16,873	19,288
	73	2,497	5,024	7,551	10,078	12,605	15,132	17,659	20,186
	74	2,625	5,280	7,936	10,591	13,246	15,902	18,557	21,212
	75	2,763	5,557	8,351	11,144	13,938	16,732	19,525	22,319
	76	2,923	5,877	8,830	11,784	14,737	17,691	20,645	23,598
	77	3,104	6,239	9,374	12,508	15,643	18,778	21,913	25,048
	78	3,312	6,654	9,996	13,338	16,681	20,023	23,365	26,707
	79	3,547	7,125	10,702	14,280	17,858	21,435	25,013	28,591
	80	3,830	7,690	11,550	15,411	19,271	23,131	26,992	30,852

Table 2: Impact of Reverse Mortgages on Consumer Spending

Source: National Bureau of Statistics, 2011 Reverse Mortgage Survey Data

Population aged 60 and above	177,650,000	177,650,000	177,650,000	177,650,000	177,650,000
Percentage take out RM	2%	4%	6%	8%	10%
Number of 60+ citizen take out RM	3,553,000	7,106,000	10,659,000	14,212,000	17,765,000
Total Annual RM payment (Billion)	269.4	538.9	808.3	1,077.7	1,347.2
Minus transfer to children (Billion)	75.1	150.3	225.4	300.5	375.7
RM payment leftover (Billion)	194.3	388.6	582.9	777.2	971.5
Percentage of RM payment spent	45.18%	45.18%	45.18%	45.18%	45.18%
Increased spending of elder people (Billion)	87.8	175.6	263.4	351.1	438.9
<u>Decrease in support from children</u>					
Annual support decrease	2358	2358	2358	2358	2358
% decrease in support	35.90%	35.90%	35.90%	35.90%	35.90%
Annual support decrease	846.5	846.5	846.5	846.5	846.5
Average number of children	1.69	1.69	1.69	1.69	1.69
Number of children involved	6,004,570	12,009,140	18,013,710	24,018,280	30,022,850
Decrease in support from children (Billion)	51	102	152	203	254
Plus increase in monetary transfer from parents (Billion)	75.1	150.3	225.4	300.5	375.7
Sum (Billion)	126.0	251.9	377.9	503.8	629.8
Percentage spent	50%	50%	50%	50%	50%
Increased spending of children (Billion)	63.0	126.0	188.9	251.9	314.9
Total consumer spending increase (Billion)	150.8	301.5	452.3	603.1	753.8

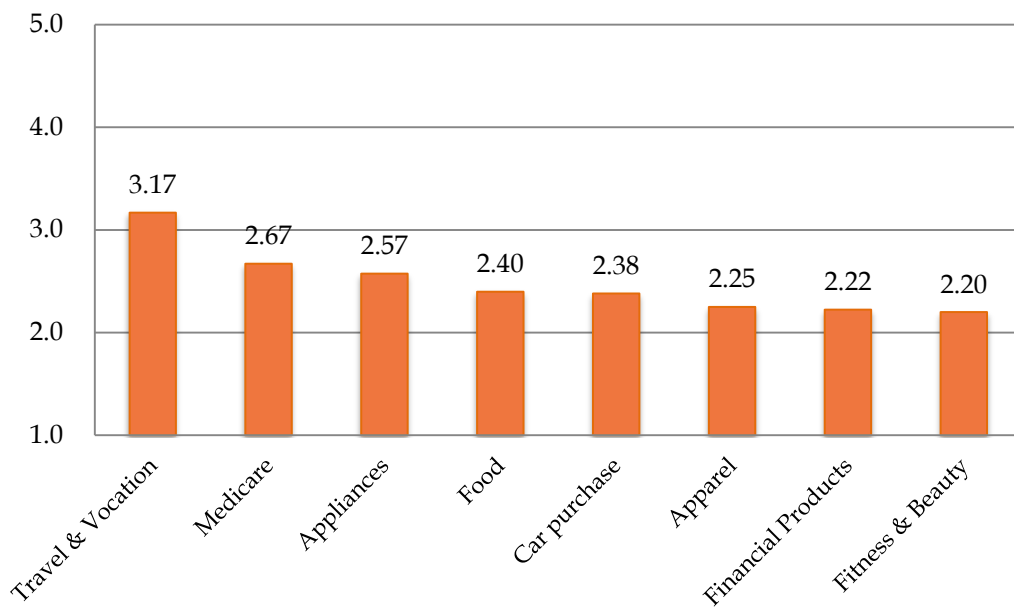
3.4.5 Impact of Increased Spending on Categories of Goods and Services

In the questionnaire, survey takers are asked to rate their increased spending on categories of goods and services after receiving the reverse mortgage payment, with 1 equal to very limited increase, and 5 equal to very significant increase.

For age groups 40 and above, the largest spending increase is on travel and vocation, with the next being medical services. Electronic appliances and food are also among the top choices as people might turn to more upscale goods after significant elevation in income. Fitness & beauty ranked bottom as the elder people in China usually do not care about their looking that much and very few of them would spend money on fitness club membership.

Chart 26: Increase in Spending on Goods and Services (Age groups 40 and above)

Source: 2011 Reverse Mortgage Survey Data

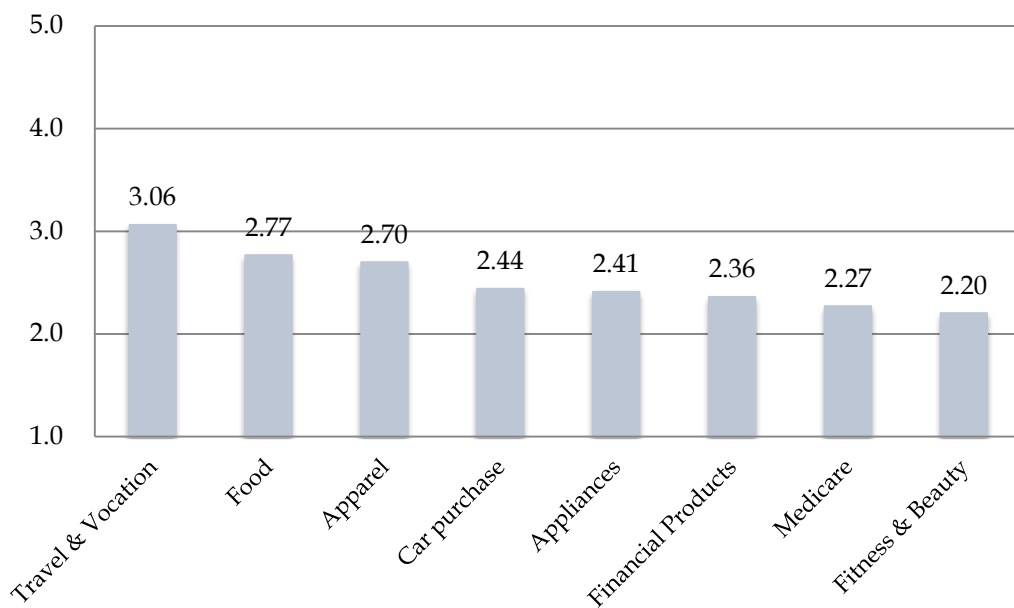


The age group 20-40 also ranked travel and vocation first, followed by spending on food, apparel and car purchase. The increased spending on food, apparel and car

purchase generally reflected the currently consumption habit of younger people in China. The medical care was ranked at a very low priority as younger people generally do not worry much about their health condition.

Chart 27: Increase in Spending on Goods and Services (Age groups 20-40)

Source: 2011 Reverse Mortgage Survey Data



The survey finds that Chinese people across all age groups tend to spend 43% of their reverse mortgage payment, which is approximately on the same level of their current spending. On the other hand, none of the increase of spending on categories of goods and services exceeds the level of 4. In general, the increase in spending of Chinese people after taking out reverse mortgage is not radical.

Chapter 4. Conclusion

The study concludes that the monetary support from younger generation to elder parents account for a relatively small percentage of their income, and the decrease in support after elder parents taking out reverse mortgage is not very significant. However, the elder parents will likely to transfer a substantial part of their monthly reverse mortgage payments to their children and boost their income by more than 20%. On the other hand, as the younger generation will usually need to pay for contingencies such as serious illness of elder parents, the reverse mortgage payments the elder people receive might relieve the children from having to pay this contingencies. Consequently, the younger generation might be able to change their savings ratio and spend more due to their elder parents taking out reverse mortgage.

In this thesis, I used the results from the reverse mortgage survey and data from People's Bank of China and National Bureau of Statistics of China to estimate the impact of reverse mortgage to overall consumer spending. Under the assumption that 2% of elder people aged 60 and above taking out reverse mortgage, the increase in overall consumer spending could reach RMB 150.8 billion. If changing the assumed percentage of elder people applying for reverse mortgage to 4%, the consumer spending could potentially increase by RMB 301.5 billion.

Among different categories of goods and services, travel and vocation will be the industry benefiting most from the introduction of reverse mortgage. Elder people will also spend significantly more on medical care, appliances, and food.

It is worth noting that nearly above 60% of Chinese across all age groups expressed

considerable interests to reverse mortgage. The age group 41-50 has the highest interest, with 33.9% of them will absolutely consider apply for reverse mortgage and 42.37% of them may apply. The implementation of inheritance tax will increase the willingness of people aged 20-50 to apply for reverse mortgage, but meanwhile decrease the willingness of people aged 50 and above to apply. Regarding the line of credit payment option, the limited exposure and understanding of Chinese to this option has made it unpopular in the survey, but this payment plan might become a perfect option for Chinese to fight against contingencies after wide-spread education of reverse mortgage.

The top reason for Chinese not wishing to apply for reverse mortgage is leaving property to children, implying that this traditional idea took strong root in China in both younger and elder generations, and might remain in a considerable period of time. On the other hand, elder people wish to apply for reverse mortgage in order to maintain high life quality after retirement and avoid increasing financial burden to children. Two other popular reasons are that they own multiple properties and paying for medical expenses.

In general, reverse mortgage has a good prospect in China and will likely to generate significant social benefit including easing the retirement of elder people and boost consumer spending. The introduction will need the lead of Chinese government on chartering and coordinating the program, providing tax benefits to the industry, detailed legislation on land usage right renewal, educating citizens, and creating mortgage insurance scheme.

Appendix

Reverse Mortgage Survey Questionnaire

Brief Introduction to Reverse Mortgage

Reverse mortgage is a special retirement planning loan that could unlock your housing equity. Not like home equity loans, it does not require you to have any income. For example, if the borrower currently owns a property worth 3 million Yuan, he/she could apply for a reverse mortgage on it and receive more than 10000 Yuan monthly as an addition to your retirement income. When the borrower passes away, ownership of the property will transfer to the lender and the mortgage is repaid automatically. Any fund leftover after repayment will be returned to heirs.

1. Where do you currently reside in?

- A. Zhejiang B. Shanghai C. Beijing D. Jiangsu E. Guangdong
F. Other _____

2. What's your gender?

- A. Male B. Female

3. What's your Age?

- A. 20-25 B. 26-30 C. 31-35 D. 36-40 E. 41-45
F. 46-50 G. 51-60 H. 61-70 I. Above 70

4. What is your employment status?

- A. Student B. Employed C. Unemployed D. Retired

5. What retirement and pension system(s) are you currently enrolled? (Select all that apply)

- A. Subsistence Security System B. Social Endowment Insurance (like 401K)
C. Government Unit Pension System (for government workers)
D. Commercial Pension Insurance E. Enrolled, but uncertain about the program
F. No pension system enrolled

6. What healthcare system(s) are you currently enrolled? (Select all that apply)

- A. College Student Healthcare B. Urban Basic Medicare Insurance
C. Government Unit Healthcare System (for government workers)
D. Commercial Medicare Insurance E. Enrolled, but uncertain about the program
F. No healthcare system enrolled

7. What is your current monthly income? (in Chinese Yuan)

- A. Under 1000 B. 1000- 2000 C. 2001- 3500 D. 3501-6000
 E. 6001- 10000 F. 10001-20000 G. 20001-40000 H. Above 40000

8. How many properties (both residential and commercial) do you own?

- A. No property B. One C. Two D. Three E. Four and above

9. Suppose you wish to sign a reverse mortgage on one of your property. According to the age you will sign the mortgage and the value of your property, you could find a number **in red that represents the money you could receive monthly until death. Please enter the amount of the money in the box below the table.**

		Reverse Mortgage Monthly Payment Table							
		Property Value in Chinese Yuan							
		¥ 500,000	¥ 1,000,000	¥ 1,500,000	¥ 2,000,000	¥ 2,500,000	¥ 3,000,000	¥ 3,500,000	¥ 4,000,000
	60	1,556	3,142	4,728	6,314	7,900	9,486	11,072	12,658
	61	1,598	3,226	4,854	6,483	8,111	9,739	11,367	12,996
	62	1,645	3,321	4,997	6,673	8,348	10,024	11,700	13,376
	63	1,699	3,428	5,156	6,885	8,614	10,343	12,072	13,801
	64	1,755	3,539	5,324	7,109	8,894	10,679	12,464	14,249
	65	1,814	3,658	5,502	7,346	9,190	11,034	12,878	14,722
	66	1,876	3,783	5,690	7,596	9,503	11,409	13,316	15,223
	67	1,946	3,923	5,900	7,877	9,854	11,831	13,807	15,784
	68	2,021	4,073	6,125	8,177	10,228	12,280	14,332	16,383
	69	2,098	4,226	6,355	8,483	10,612	12,740	14,868	16,997
Age Reverse Mortgage Starts	70	2,184	4,399	6,614	8,829	11,044	13,259	15,474	17,689
	71	2,278	4,587	6,895	9,204	11,513	13,821	16,130	18,439
	72	2,384	4,799	7,214	9,629	12,044	14,458	16,873	19,288
	73	2,497	5,024	7,551	10,078	12,605	15,132	17,659	20,186
	74	2,625	5,280	7,936	10,591	13,246	15,902	18,557	21,212
	75	2,763	5,557	8,351	11,144	13,938	16,732	19,525	22,319
	76	2,923	5,877	8,830	11,784	14,737	17,691	20,645	23,598
	77	3,104	6,239	9,374	12,508	15,643	18,778	21,913	25,048
	78	3,312	6,654	9,996	13,338	16,681	20,023	23,365	26,707
	79	3,547	7,125	10,702	14,280	17,858	21,435	25,013	28,591
	80	3,830	7,690	11,550	15,411	19,271	23,131	26,992	30,852

Your Monthly Advance Is:

RMB

10. How many children do you have?

- A. No children B. One C. Two D. Three E. Four and Above

11. What's the average monthly income of your children? (in Chinese Yuan)

- A. Under 1000 B. 1000- 2000 C. 2001- 3500 D. 3501-6000
 E. 6001- 10000 F. 10001-20000 G. 20001-40000 H. Above 40000

12. Please estimate the amount of monetary support you receive from each of your children annually (in Chinese Yuan)

- A. Under 500 B. 500-1000 C. 1001-3000 D. 3001-5000
 E. 5001-8000 F. 8001-15000 G. 15001-25000 H. Above 25000

13. What percentage of income do you save in bank accounts?

- A. Under 10% B. 10-20% C. 21-30% D. 31-50%
 E. 51-70% F. 71-90% G. Above 90%

14. What percentage of the additional monthly payment received from reverse mortgage will you spend?

- A. Under 20% B. 20-30% C. 31-50% D. 51-70% E. 71-90% F. Above 90%

15. What categories of products and services will you most likely increase spending on? (Please circle a number from one to five. 1 = very limited increase, and 5= very significant increase)

	Very Limited Increase		Moderate Increase		Very Significant Increase
Medicare	1	2	3	4	5
Health and beauty	1	2	3	4	5
Travel and Vocation	1	2	3	4	5
Food	1	2	3	4	5
Apparel	1	2	3	4	5
Transportation (Buy Car)	1	2	3	4	5
Appliances	1	2	3	4	5
Financial Products	1	2	3	4	5

16. What is your expectation of the percentage decrease in monetary support from children after the additional monthly payment from reverse mortgage?

- A. No decrease B. under 10% C. 10-25% D. 26-40%
 E. 41-60% F. 61-80% G. above 80%

17. After receiving the monthly reverse mortgage payments, will you consider giving money to your children or grandchildren? If so, what percentage of monthly payment will you allocate for this purpose?

- A. No Increase B. under 10% C. 10-25% D. 26-40%
 E. 41-60% F. above 60%

18. According to your current understanding to reverse mortgage, will you consider applying for a reverse mortgage to make your retirement life easier in the future?

- A. Absolutely will apply
- B. May apply
- C. Hard to say
- D. May not apply
- E. Absolutely won't apply

19. Line of credit is another way to receive your reverse mortgage payment. For example, a property worth 2 million Yuan will have a credit line of 1 million Yuan if reverse mortgage starts in the age of 60. This method allows you to withdraw any capital within the credit line, and only the capital withdrawn incurs interests. Capital not withdrawn will earn an interest rate that is 80% of the base lending rate posted by PBOC. (Given current rate of 5.4%, 1 million credit line will grow to 1.3 million in 5 years) If the line of credit is available, will you consider applying for a reverse mortgage to make your retirement life easier in the future?

- A. Absolutely will apply
- B. May apply
- C. Hard to say
- D. May not apply
- E. Absolutely won't apply

20. If in the future the inheritance tax is enforced, a 2-million Yuan property will be taxed for 0.35 million while inherited. Will you consider applying for reverse mortgage (the payment is tax-free) to avoid the inheritance tax?

- A. Absolutely will apply
- B. May apply
- C. Hard to say
- D. May not apply
- E. Absolutely won't apply

21. If you do NOT wish to apply for reverse mortgage, the major reasons will be?

- A. Plan to leave my property to children
- B. Could lower the spending after retirement
- C. Have sufficient retirement income to maintain quality of life
- D. Have sufficient savings accumulated
- E. Have financial support from my children
- F. Limited understanding to reverse mortgage
- G. Reverse mortgage is not a good deal for me

22. If you wish to apply for reverse mortgage, the major reasons will be?

- A. Have several properties
- B. No heir
- C. Want to maintain high quality of life after retirement
- D. Social security unable to cover spending
- E. Avoid increasing financial burden of children
- F. Pay medical care expense
- G. Increase financial support to children and grandchildren
- H. Reverse mortgage is a good deal
- I. Want to use part of payment for philanthropy
- J. Want to spend the wealth built up by my own
- K. Want to live with dignity after retirement
- L. Bad relationship with kids (kids does not exercise filial piety)

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