

# Risk Overview of the Reverse Mortgage Endowment Insurance<sup>1</sup>

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## Abstract

Reverse mortgage endowment insurance business has been characterized as a high-risk business. Generalized risk refers to the uncertainty of the risk of income. The result of a behavior may be loss or profit or no loss no profit. In narrow sense, risk refers to the damage of uncertainty. In insurance theory and practice, the uncertainty of risk refers to losses. So the risk that this article discussed generally refers to the narrow sense of risk.

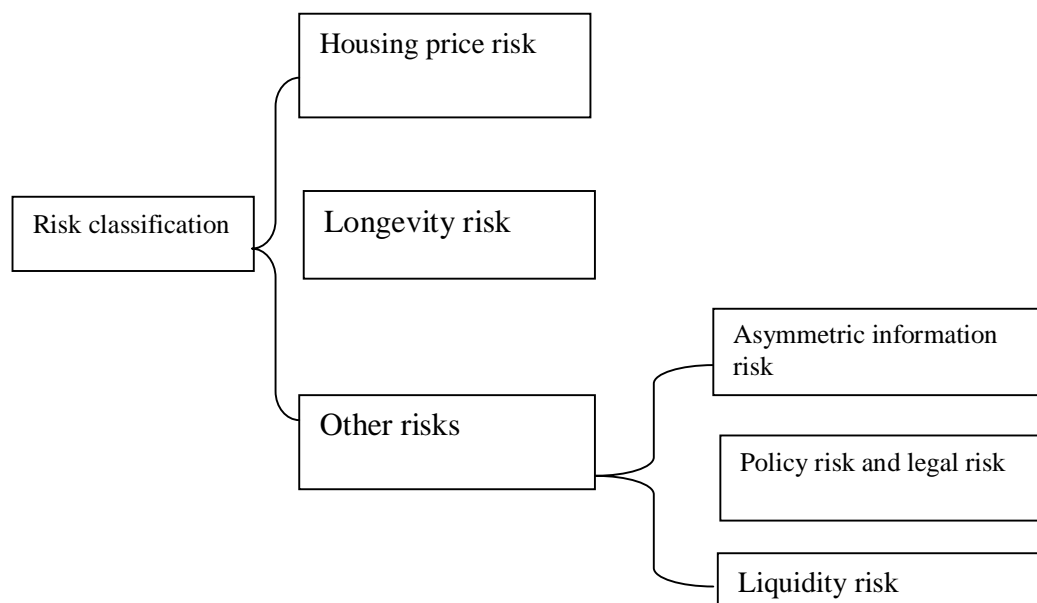
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## 1. Introduction

Reverse mortgage endowment insurance business covers many types of risk. Operational risk can be classified with reference to the following types of criteria:

According to participate in the main divide, can be divided into borrowers risk, lenders risk and service principal risk. Borrower's risks include the risk of bankruptcy of lenders, purchasing power risk. Borrowers risks include interest rate risk, house price risk, longevity risk, moral risk, liquidity risk, default risk, cost risk, purchasing power risk. Service Principal risks include policy risk, legal risk.

**Chart 1: Risk Classification**



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## **2. Housing Price Risk**

### **2.1 Identification of Risk**

Housing price risk refers to the risk arising due to falling house prices. In a reverse mortgage endowment insurance business, the behavior of buying houses is a real estate investment behavior. The investment losses when prices fall, is housing price risk. It can be summed up from the United States, the Netherlands and other countries to carry out a reverse mortgage endowment insurance business. When housing prices increase, the reverse mortgage endowment insurance scale grows. If housing prices do not accurately anticipated risk and prevention, in times of financial crisis, houses were forced to sell.

In a reverse mortgage endowment insurance operation mode, housing price risk performances when the borrower's loan principal and interest overcomes house value. If no suitable risk-sharing mechanisms, the borrower will face housing property "negative equity". Lending institutions will face amount of the loan cannot be put back. This product becomes a money-losing proposition. Therefore, the risk of falling house prices will greatly affect reverse mortgages pension operating smoothly.

Pricing issues is the core issue of reverse mortgage endowment insurance business. Pricing is based on the fundamental value of real estate collateral. House prices and pricing is positively correlated. The expected value of the property and the ratio may be a positive correlation. If the expected value of the property is higher, the higher payment can be reached amount each period. If the expected value of the property is lower, the lower payment amount each period. As the value of the property is dynamic, housing value is difficult to be accurately predicted. Therefore, the risk arising from changes in housing prices has become the focus of pension risk research.

### **2.2 Causes of House Price Risk**

To study the risk of falling house prices, the first is to study what factors the value of the property, then determine what factors cause prices to rise, which factors cause prices to fall. Secondly, factors causing prices to fall can be divided into the risk factors that can be dispersed and the risk factors that cannot be dispersed. Finally, in a reverse mortgage endowment insurance business how it can be considered to diverse risk. Try to avoid the negative factors, reducing the risk of falling house prices brought about.

The dynamic changes in the value of the property performance for two, changes in individual and changes in universal.

Universal value of the property can be expressed as changes in nationwide and changes in regional. Because of the universal value of the property changes greatly affected by macroeconomic factors, it can be explained by fluctuations in the real estate cycle theory and the real estate bubble theory. Dynamic changes of individual property values depend on two aspects, dynamic changes of the value of housing construction and land value. The value of housing construction and housing land values in a way often exhibit a certain percentage relationship.

Fluctuations in the value of housing construction include physical depreciation, functional depreciation, variability risk housing. Due to the physical depreciation and functional depreciation are property attribute of the building, in the life cycle of the building, the value is in the process of declining. Variability risk rarely lead to rising housing values. The value of housing construction process has been in decline. This is also the main factor that leads to individual property depreciation.

#### **(1) Physical depreciation of the building.**

With longer time, the physical depreciation refers to building age gradually increase, the house itself is wear and tear. Under normal circumstances, physical function achieves the optimal of bridal chamber, and then gradually decreased.

#### **(2) Functional depreciation of the building.**

With the development of the era, housing construction level gradually improve. The past level of the building cannot meet the current needs. The development of housing function is behind the times. In the development history of housing construction, constantly the old building was eliminated by the new building.

### (3) The variability of risk.

Variability risk refers to the risk of housing values change due to the location changes, and other unpredictable factors and force majeure cause. Due to accident and emergency and force majeure, houses destroyed in its life cycle. This leads to a building maintenance cost and disposal cost to increase, and lead to a difficulty to liquidate.

### (4) Land value

The fluctuations of the land value depends on the government land policy, urban planning and construction, land supply demand relations, the population factor. With the speeding up of urbanization process in recent years, there is a growing urban population. The scarcity of land and irrefragable make urban planning and construction land increasingly nervous. The urban land resource is in short supply. The land value generally is the trend of rising, few back. In the process of urban development in our country, the government policy factors is the main reason of the changes in land value. The policy of "land lease" is an important driver of rising land values.

The determination of loans and issuing differ with loan repayments for ten years. The longer the time, accurate forecast of a home's value changes is more difficult.

## **2.3 Prices Cyclical Fluctuations**

The property cycle is repeated irregular fluctuations in total revenue of real estate. The real estate fluctuation cyclical theory separated from cyclical theory. The theory is that the real estate cycle and economic cycle has certain correlation. The economic cycle acts on the developers of real estate investment strategy with credit institutions, which acts on the real estate cycle. The real estate cycle fluctuations is objective existence and is predictable. Because of the reality of the real estate cycle fluctuation in the end of last century in developed countries, This theory has experienced rapid development.

## **2.4 The Risks of Real Estate Bubble**

The famous American economist Charles Kinder thought that real estate bubble can be understood as real estate prices continue to rise in a continuous process. The prices make people expect prices to rise further, and constantly attract new buyers. As prices and speculative capital continue to increase, rising real estate prices is much higher than the corresponding entity price with them. This kind of phenomenon will lead to a real estate bubble. Excessive expansion of the bubble is expected to reverse, the high vacancy rate and the sharp fall in the price. It is the essence of sustainability.

Foreign research has shown that the main causes of the produce and break of the housing bubble include international capital flows, relaxation of financial regulation, low interest rates, the distortion of preferential tax policy, fiscal policy and the real estate industry strict land limit, inelastic supply of land and other factors.

At present, there are many studies of whether there is a real estate bubble in China as well as the damage degree. To introduce reverse mortgage endowment insurance in our country, we must fully estimate the possible impact of real estate bubble. House is the only guarantee of reverse mortgages. While property prices in a rising phase, for lending institutions, real estate sale price will be much higher than the expected price, lending institutions get better returns. If the opposite case, lenders will surely suffer heavy losses, even with the risk of bankruptcy. Although in the long run, a country or a region's real estate prices always keep a rising trend, but if there is a wrong judgment of the market, it can appear serious consequences.

## **3. Longevity Risk**

### **3.1 Longevity Risk Identification**

For longevity risk identification it is the first step, longevity risk management is the basis for the longevity risk management. Contents include perception of longevity risk and the analysis of the cause of longevity risk. Correctly identifying longevity risk helps to further measures and longevity risk prevention.

Longevity risk refers to the lifetime annuity payment mode. When the old man's life is longer than life expectancy, at the same time, lenders still have to pay annuities according to the predetermined manner. To the elderly, loan granted loan according to the years accumulated year by year. So when the contract expires, lenders will appear to pay an amount greater than the value of the total amount of the annuity. This is the longevity risk to the lenders.

In short, the total loans exceed the value of the property is longevity risk losses of the lending institutions. The critical risk is caused by the uncertainty of the life of the borrower. If we choose one-time loan payment method in the mode of payment, borrower itself still face inadequate protection of the elderly longevity risk.

### **3.2 Causes of Longevity Risk**

Longevity risk is mainly due to the information asymmetry between lenders and borrowers. Lenders have incomplete information. Borrowers living conditions improve and extend the service life. There is a general improvement in the average life expectancy in the elderly. The longer the loan, the greater the risk.

Life expectancy for the elderly individuals decided the amount the old man can get on a regular basis. Life expectancy mainly depends on the individual's physical health. For the elderly individual health information, including medical history and physical health predictions for the future, elders are in advantage while lending institutions in disadvantage. When the information superiority side take decision in favor of their own interests, it is harmful to the other party. The asymmetric information improves the likelihood of the longevity risk to the lender.

Thanks to a lifetime annuity, elders make their houses into cash. In the practice of reverse mortgage endowment insurance, pension annuity became source of its mainstay to meet the demand of endowment. Comparing to the old man's income and living standard, The old man's living standard has improved due to reverse mortgage endowment insurance.

The progress of modern social medical treatment level and the strengthening of health care prevention makes people prolong the average life expectancy.

The accuracy of predicted value and prediction of the span of time have relevant relationship. The longer the elders live, the greater the difficulty of prediction of the value of a home. The difference between the loan principal and interest and value of their homes are easier to emerge.

## **4. Other Risks**

### **4.1 Asymmetric Information Risk**

The risk of moral hazard and adverse selection belongs to the typical asymmetric information risk. Moral hazard is usually caused by information asymmetry. Moral hazard refers to the economic activity, when signing a party (the agent) incomplete risk consequences to make their own effectiveness maximization, at the same time the selfish behavior of damage the interests of the clients. This kind of selfish behavior often shown as a kind of "hidden action".

In reverse mortgage endowment insurance, the risk of moral hazard risk performance as housing maintenance in the first place. Borrowers in reverse mortgage endowment insurance contracts still live in the house, after the borrowers have the obligation to maintain building completely and in good condition. Borrowers belong to the agent, lenders belongs to the client. Borrowers are in information superiority. Lenders are in the informational disadvantage. The lenders cost high to maintain a real-time monitoring. When housing maintenance risk occurs, there is a fall in the value of the property. The lenders are faced by critical risk in advance. when the contract expires, house prices fall. Damage to housing maintenance is the agent of the "hidden action".

Second, the moral hazard of the borrower is the risk of dwelling time. The end of the period normally is the date of death, or permanent moving out. To extend the contract period, the borrower is likely to extend the time to live, to delay moved from mortgage housing, so as to get more contract payment. At this time deliberately prolong living time is the agent of "hidden action".

Asymmetric information risk also shows as the health risk of adverse selection under the circumstance of asymmetric information. The borrowers fully grasp their own health information. When the reverse mortgage endowment insurance payment limit is determined, the worse health borrowers receive higher limit. The borrower will conceal true health information, even make false "health assessment book" for higher pay. The false "health assessment book" is the agent of the hidden information.

Housing maintenance risk mainly comes from system design. Part of the property's value is endogenously determined. The borrower have low expectations for the rest of the property values. The supervision costs too much.

Residential extension of the borrower risk mainly comes from a single pension places and a lifelong residency in system design.

Adverse selection risk under health information asymmetry conditions mainly comes from the lender for that the health information is not acceptable. Market credit mechanism is not perfect.

#### **4.2 Policy Risk and Legal Risk**

Policy risk mainly refers to the risk arising from changes in the policies and regulations. Running mechanism of reverse mortgage endowment insurance product is no longer suitable for the current policies and regulations. At present in our country, market economy system is not perfect. The change of macro policy and land policy will affect the reverse mortgage endowment insurance business and operation.

Legal risk is due to incomplete legal system, imperfect credit concept. Borrowers are difficult to repay the debt. They even refuse to pay the debt. When such things happen, lenders have economic losses. At the same time, the relevant laws and regulations is not perfect. This tends to make the rights and interests of the elderly violated in different degree. In reverse mortgage endowment insurance business, numerous laws need to re-examine, continually revised to perfect.

#### **4.3 Liquidity Risk**

Liquidity risk refers that the lending institutions liquidity meet obstacle and capital turnover of lending institutions is in trouble. Reverse mortgage endowment insurance products take housing assets as collateral, loans have certain guarantee for safe recovery. But in the face of unlimited cycle, collateral value changes, interest rate risk of instability, advance and housing repairs and other factors, there is a huge risk. In the process of reverse mortgage endowment insurance annuity payments, the value of the mortgaged property is directly related to the interests of both sides to make loans. The value of the property is affected by many factors, such as land price, construction cost, market supply and demand, its properties, and so on, most of which are unpredictable. This makes that the real estate price is very difficult to predict in the future. Uncertainty of the future value is the main source of reverse mortgage endowment insurance risk. Due to the vast majority of reverse mortgage endowment insurance product cycle is long, the lenders have to wait until they sell their houses to get their money back. And this time is uncertain, so lenders capital turnover also has a lot of uncertainty. In addition, if lenders can't sell houses at a price of more appropriate, they will also face a liquidity risk.

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