

Analysis on the Current Situation, Trend and Game Theory of Retirement Real Estate

Ruoshan Wang

Hefei No.168 Middle School, Hefei, Anhui, China

Abstract: Nowadays, the aging in China's society is severe, and the elderly care service industry cannot meet the needs of the elderly care. The retirement real estate is highly related to the elderly care service industry, but its development lags behind. The development of retirement real estates are analyzed from their management status, industry barriers and game theory. With the increasingly severe aging problem and the growing demand for elderly care, the application of game theory in the field of retirement real estate will be more in-depth and extensive.

Keywords: China's Elderly Care Services and Retirement Real Estates; Industry Barriers; Game Theory Analysis

1. Introduction

The situation of China's elderly care service industry is serious, and that the development is imminent, and it is in urgent need of policy support and efforts of all parties to analyze the development strategy of retirement real estate from the aspect of game theory.

2. Current Situation of Elderly Care Services in China

In China, the aging population has become a severe social problem. By the end of 2022, the population aged 60 and above in China had exceeded 280 million, accounting for 19.8% of the total population. Among them, the

population aged 65 and above reached 210 million, accounting for 14.9% of the total population, surpassing the world average of 9.3%.

According to the high, medium, and low population projections in the United Nations "World Population Prospects 2022," China's population aging level will increase at the fastest rate during the period 2022-2032. Research predicts that by 2025, the population aged 60 and above will exceed 300 million, and by 2033, it will surpass 400 million. China will enter a heavily aged society before 2035, with the proportion of the population aged 65 and above reaching 20%.

The scale of China's elderly care market had already exceeded 9.4 trillion yuan in 2022 and may reach 30 trillion yuan by 2028. In the coming period, the total supply of elderly care services faces enormous challenges, while the total demand for elderly care services continues to grow rapidly.

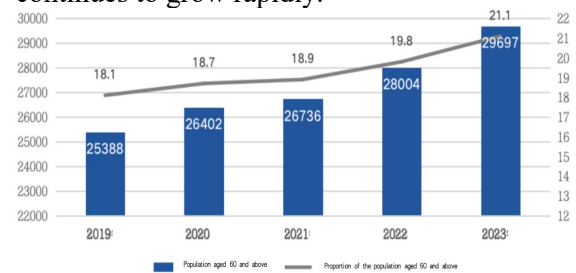


Figure 1. Proportion of the National Population

Note: The data source for this graph is the National Bureau of Statistics

Table 1. China's Population Aging Trend

			account for total population		Proportion of total population		Proportion of total population
2010	13.76	1.73	12.57%	1.15	8.36%	0.21	1.53%
2020	14.72	2.45	16.64%	1.74	11.82%	0.30	2.04%
2030	15.24	3.55	23.29%	2.44	16.01%	0.43	2.82%
2040	15.43	4.09	26.51%	3.24	21.00%	0.64	4.15%
2050	15.21	4.38	28.80%	3.32	21.83%	1.00	6.57%

Source: "Pension Service and Industry Development" Hunan People's Publishing House Page 4 Table

3. Current Development of Elderly Care Real Estate in China

The government attaches great importance to and frequently issues policies to encourage the development of the elderly care industry. Especially after the formal approval of the "13th Five-Year Plan," the elderly care industry entered a fast track.

Real estate companies with a high correlation to the elderly care service industry are actively

entering and focusing on the elderly care industry. According to incomplete statistics, several real estate companies including Vanke, Poly, Tahoe, Sino-Ocean, and Gemdale have already made efforts in elderly care real estate. Currently, elderly care real estate in China is still in its initial stage. Particularly in the past two years, as the real estate industry has undergone adjustments, the entry of real estate companies into elderly care real estate has noticeably slowed down.

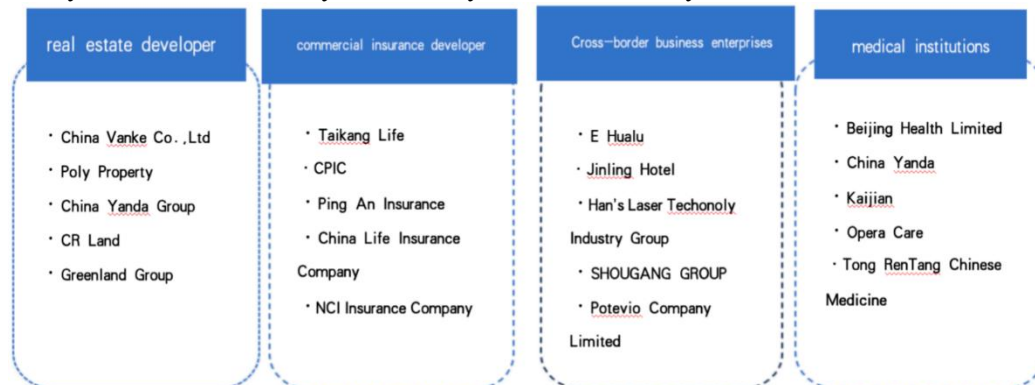


Figure 2. Market Participants

Table 2. Summary of Relevant Policies for Pension Real Estate as of 2021

December 2020	Opinions on establishing and improving the high quality development of pension services in the establishment of a comprehensive supervision system	Three policy measures were identified on the establishment and improvement of the integrated supervision system of the pension service: - is a clear focus of supervision. Strengthen quality and safety supervision, increase supervision and inspection of key links such as buildings, firefighting foods, health care; second, implement supervision responsibility. Strengthen the leadership responsibility of the government, deepen the "ventilation stocks" reform in the field of pension services; third is the innovative supervision. Strengthen collaborative supervision.
July 2020	Guidance for the comprehensive promotion of urban old community renovation work	Among them, the provision of public services such as pension, medical care is an important part of the renovation of old communities. It helps to rely on the development of the community to provide a buffet, help medicine, help, help, etc. Service.
December 2019	Basic specifications of service safety of pension institutions	The first mandatory national standard in the field of pension offices in China has clarified the "Red Line" of the service safety of the pension institution, which will help prevent, investigate and rectify the safety hazards in the service of pension institutions, and promote the high quality development of pension services.
April 2019	Opinions on promoting the development of pension services	Exploring the public management method of pension institutions; solving the fire test problem of pension institutions; supports the scale of pension institutions, chain development; promotes the resolution of financing issues; fully implement foreign investment Institutional national treatment; enhance medical combination service ability; promote the development of home, community and institutions; implement "Internet + pension" action.
September 2018	Improve the implementation plan for the promotion of	Reaffirming the establishment of the pensioner; establishing a classification and management system of pension institutions, accelerating the promotion of public pension institutions to

	consumer institutions (2018-2020)	enterprises or carry out public construction, establish and improve public-building in the field of pension, and focus on the background Safeguarding Functions and Public Coordinated Problems.
August 2017	Implementation opinions on the development of pension service industry on the use of government and social cooperation models	Guide and encourage social capital through PPP mode, based on the basic endowment services and improved medium-end pension services, participate in the construction of pension institutions, community pension system, and promote medical combination.

Currently, the main profit models for various real estate companies in the elderly care industry are as follows:

Non-holding sales model: Generating cash flow by selling properties.

Property holding model: Earning rental income by renting out beds, or charging membership fees through a membership model.

A balanced approach combining both rental and sales models.

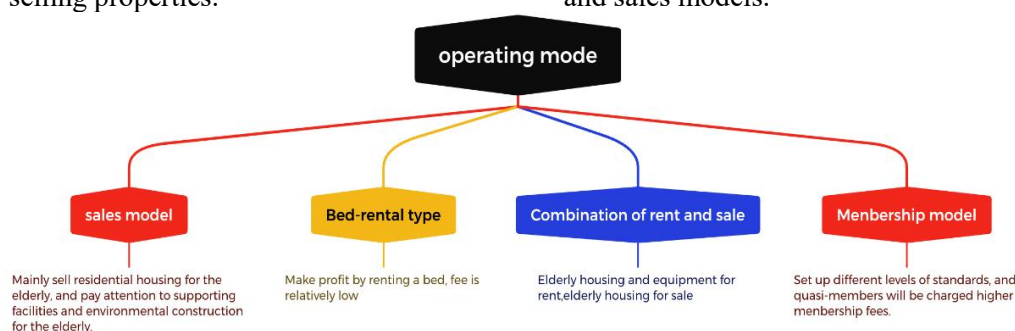


Figure 3. Elderly Real Estate Industry Barriers and Game Theory

4. Barriers in the Elderly Real Estate Industry

4.1 Capital Barrier

The elderly real estate industry is capital-intensive, requiring large amounts of funds for extended periods. Land acquisition costs have increased due to improved land transfer systems and transaction rules. Financing sources are limited, mainly relying on self-owned funds, bank loans, and pre-sale returns. Capital strength and financial operations have become core competitive factors, especially in land resource acquisition. Companies with good credit in the capital market gain competitive advantages through diversified financing channels.

4.2 Policy Barrier

Policy barriers refer to entry obstacles created by government administrative measures to optimize market resource allocation. China's elderly real estate market is under intensive policy regulation, focusing on controlling land and fund acquisition. In first and second-tier cities, land is usually acquired by stronger developers due to high prices and fierce competition. In local cities, governments

expect land development to attract investment and drive regional development, giving developers advantages in obtaining government support and policy preferences.

4.3 Land Resource Barrier

Obtaining quality land resources is a key barrier to entering the elderly real estate industry. Land is the core resource, and project success is closely related to location. Quality urban land resources are scarce and non-renewable, with core areas already transferred and developed. New entrants face decreasing quality land resources and increasing costs, raising the industry entry threshold.

4.4 Lack of Product Development Resources

Elderly real estate should focus on providing elderly care services, especially medical and nursing care. Real estate companies often lack expertise in these areas and currently collaborate with domestic and international medical and elderly care institutions to compensate for resource shortages.

4.5 Lack of Operational Management Experience in the Elderly Care Industry

5. Game Theory and Elderly Real Estate

As global aging issues intensify, elderly real estate has gained attention as an emerging real estate sector. It integrates health, medical, elderly care, and end-of-life care services, combining real estate, property management, and investment functions. In China, besides elderly living quality, the related industry market structure directly affects elderly real estate development as a crucial solution to aging problems. The following discusses development strategies and risk-sharing mechanisms from a game theory perspective.

(I) Game Theory Basics

Game theory studies how participants formulate optimal strategies to maximize their interests based on available information in competitive, cooperative, or conflicting situations. The basic premise is that all participants are "rational individuals" pursuing maximum self-interest. The core of game theory lies in formulating strategies that enable participants to obtain maximum benefits in complex and changing environments.

(II) The Game Environment of Elderly Real Estate

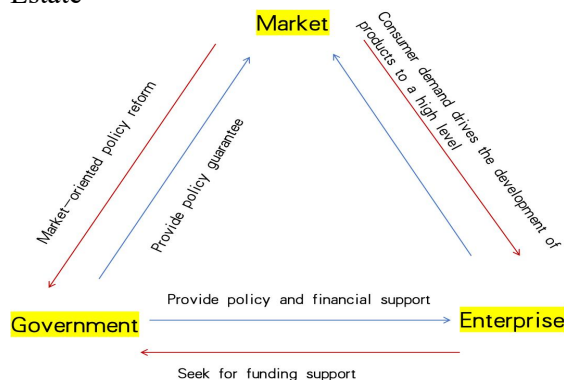


Figure 4. Analysis of Participants and Strategies in Elderly Real Estate Industry

In the game environment of elderly real estate, the main participants include the government, developers, financial institutions, consumers, and elderly care service providers.

5.1 Government

The government guides and supports the development of elderly real estate by introducing relevant policies and regulations, acting as both policymaker and regulator. The government also aims to promote the development of the elderly care industry through elderly real estate projects, improve social welfare, and enhance the quality of life for the elderly.

5.2 Developers

Developers are responsible for developing, constructing, and operating elderly real estate projects. They need to invest significant capital, land, and human resources, while also bearing the risks associated with project operations.

5.3 Financial Institutions

Financial institutions provide financing support for elderly real estate projects through various means, including bank loans, trust funds, and private equity. They play the role of fund providers in projects while also needing to assess project risks and seek reasonable returns.

5.4 Consumers

Consumers are potential clients of elderly real estate, including the elderly and their families. They choose suitable elderly real estate projects based on their needs and payment abilities.

5.5 Elderly Care Service Providers

These providers professionally offer elderly care services for real estate projects, such as medical care, health management, and daily care. The quality of their services directly affects consumer satisfaction and project operational effectiveness.

(1) Game Strategies

In the game process of elderly real estate, each participant needs to formulate appropriate strategies based on market environment, policy orientation, and their own conditions.

1. Government

The government can support the development of elderly real estate projects through preferential policies, financial subsidies, and optimized approval processes. Simultaneously, the government needs to strengthen supervision to ensure project compliance and quality.

2. Developers

Developers need to focus on the quality of project planning, design, and construction to enhance market competitiveness. They also need to seek cooperation with partners such as financial institutions and elderly care service providers to share risks and maximize benefits.

3. Financial Institutions

When providing financing support, financial institutions need to fully assess project risks

and develop reasonable risk control measures.

4. Consumers

When choosing elderly real estate projects, consumers need to comprehensively consider factors such as geographical location, service quality, and price. They also need to pay attention to the project's operational status and risk conditions to ensure their rights are protected.

5. Elderly Care Service Providers

Elderly care service providers need to continuously improve their service quality and professional level to meet the growing consumer demands. They also need to actively cooperate with developers to jointly create high-quality elderly real estate projects.

(2) Application of Game Theory in Elderly Real Estate

1. Risk-Sharing Mechanism

Risk-sharing is an important topic in elderly real estate projects. A reasonable risk-sharing mechanism can be constructed by introducing game theory concepts and methods. For example, under the PPP (Public-Private Partnership) model, the government, social capital, and consumers can determine their respective risk-bearing proportions and benefit distribution mechanisms through game theory models.

2. Market Competition and Cooperation

In the elderly real estate market, there is both competition and cooperation among participants. Game theory analysis methods can reveal the laws of competition and cooperation in the market and provide a basis for participants to formulate appropriate strategies.

3. Resource Allocation and Optimization

In elderly real estate projects, the optimal allocation of resources such as land, capital, human resources, and intellectual resources is crucial for project success. Game theory analysis methods can be used to simulate and optimize the resource allocation process to maximize resource utilization.

4. Benefit Distribution and Incentive Mechanism

In elderly real estate projects, a reasonable benefit distribution mechanism can motivate participants to actively invest and continuously optimize project operations. Game theory can provide theoretical support for constructing such mechanisms.

5. Consumer Behavior and Demand Analysis

In the elderly real estate market, consumer behavior and demand are key factors in project success. Game theory can help analyze consumer decision-making processes, understand their preference changes, predict market trends, and formulate targeted marketing strategies.

6. Policy Formulation and Regulatory Optimization

As the regulator and policymaker of the elderly real estate market, the government needs to continuously optimize regulatory policies and market rules to promote healthy market development. Game theory can provide theoretical support for policy formulation, helping the government predict policy implementation effects and potential problems.

6. Conclusion

Game theory, as an important analytical tool, has broad application prospects in the field of elderly real estate. By introducing game theory ideas and methods, we can deeply explore issues such as competition and cooperation rules, risk-sharing mechanisms, resource allocation optimization, benefit distribution and incentive mechanisms, and consumer behavior and demand analysis in the elderly real estate market. These research results will not only help promote the healthy development of the elderly real estate market but also help improve the quality of life and social welfare of the elderly. In the future, with the increasingly severe aging problem and growing elderly care needs, the application of game theory in the elderly real estate field will become more in-depth and extensive.

References

- [1] Monograph: Chen Shuhong, "Elderly Care Services and Industry Development," Hunan People's Publishing House (2007)
- [2] Statistical data: "2023 Statistical Bulletin on the Development of Civil Affairs," Ministry of Civil Affairs official website, August 2024
- [3] Monograph: John von Neumann and Oskar Morgenstern, "Theory of Games and Economic Behavior," Peking University Press, May 2018
- [4] Papers: John Nash, "Equilibrium Points in n-Person Games" (1950), John Nash, "Non-Cooperative Games" (1951)