

An empirical study on the influence of population structure on residents' housing demand -- Taking the survey data of Chongqing as an example

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Abstract: Cities of different grades and regions have different characteristics of the real estate market, so the housing needs of residents are very different. The study on the impact of population structure on residents' housing demand should be based on the empirical study of specific cities. Taking Chongqing, a "new first-tier" city located in the southwest, as the object of empirical research can make the research results more concrete and the policy suggestions more credible.

1. Introduction

The research results of domestic and foreign scholars on the impact of population structure on residential demand and real estate price are not obvious, but there are few empirical studies on the impact of population structure on residential housing demand^{[1],[2]}. The survey team believes that different levels and regions of the city, the characteristics of the real estate market is different, and residents' housing needs are very different. The study of the impact of population structure on residents' housing demand should be based on the empirical study of specific cities. As the only municipality directly under the central government in central and western China, an important central city in the country, an economic center in the upper reaches of the Yangtze River and a core city in the Chengdu-Chongqing economic circle, Chongqing has its unique population structure. Whether the population structure of Chongqing has an impact on the housing demand of residents needs to be investigated and studied to draw corresponding conclusions.

2. Technical route

By reviewing the literature, this survey proposes the research purpose and the problems to be solved, and decides to analyze its impact on residents' housing demand from the perspective of demographic structure. The selection of population structure factors is optimized on the basis of summarizing previous research results^[3]. The research is based on Chongqing, and the empirical analysis is carried out with the econometric analysis method. Finally, based on the research conclusions, the paper puts forward some policy suggestions for adjusting

the real estate market and optimizing the development of housing products in Chongqing. The technical route is shown in Figure 1.

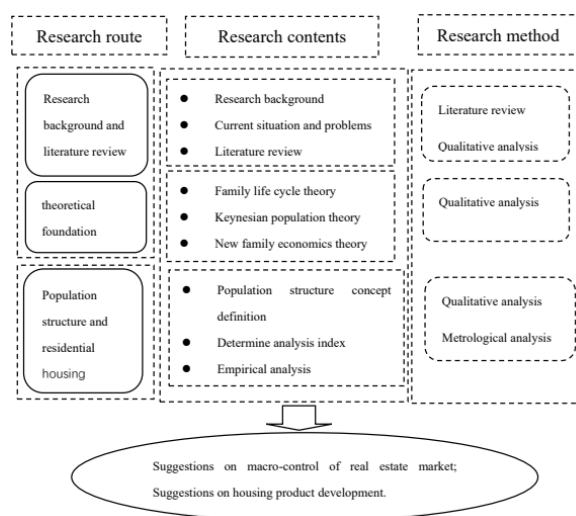


Fig. 1. Technical route

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3. Current situation analysis

3.1 Correlation analysis of population regional structure factors and residents' housing demand

3.1.1 The correlation between the proportion of resident population and residents' housing demand

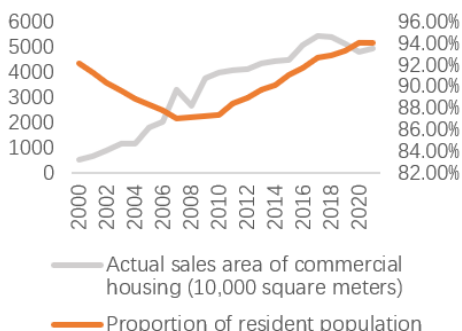


Fig.2. The correlation between the proportion of resident population and residential housing demand

As can be seen from the figure 2, the proportion of resident population at the beginning of this century (2000-2007) is negatively correlated with residential housing demand. This stage is the primary stage of the development of Chongqing's real estate market. Although the proportion of resident population is declining due to the inertia of migrant work, the actual sales area of commercial housing in Chongqing is still rising slowly. The reason is that this stage is an important stage of Chongqing's urbanization development, and a large number of agricultural population is transformed into urban population. This process will inevitably lead to an increase in demand for commercial housing. After 2007, this situation began to develop and change, and the actual sales area of commercial housing was basically positively correlated with the proportion of resident population. The number of migrant workers has decreased significantly, on the contrary, more and more people from other places go to Chongqing to settle and work, that is, the proportion of resident population continues to rise. The increase of resident population has significantly increased the housing demand of residents, and the actual sales volume of commercial housing has increased year by year^[4].

3.1.2 The correlation between the proportion of urban population and residents' housing demand

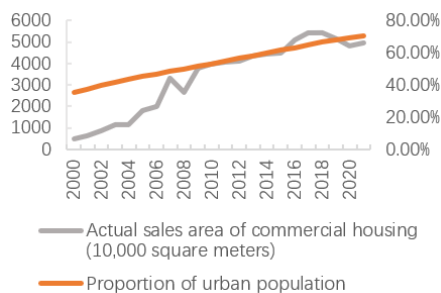


Fig. 3. The correlation between the proportion of urban population and residents' housing demand

The process of urbanization is inevitably accompanied by the movement of population from rural to urban areas. The core of urbanization is the transformation process of population employment structure, economic and industrial structure, and the transformation process of urban and rural spatial community structure. The essential characteristics of urbanization are mainly reflected in three aspects: first, the spatial transformation of rural population; Second, non-agricultural industries are gathering in cities and towns. The third is the transfer of agricultural labor to non-agricultural labor. The spatial transformation of the agricultural population has produced a large number of housing demands, which promotes the rapid development of the real estate market. As can be seen from the figure 3, since 2000, the proportion of urban population in Chongqing has increased year by year, from 35.59% in 2000 to 70.32% in 2021, indicating that the urbanization rate of Chongqing has exceeded 70%. At the same time, the actual sales area of commercial residential buildings rose from 4,910,900 square meters in 2000 to 49,454,200 square meters in 2021, and the sales area in 2021 is nearly ten times that in 2000. This set of data well shows the correlation between the proportion of urban population and residents' housing demand.

3.2 Correlation analysis between natural structure factors of population and housing demand of residents

3.2.1 The correlation between the proportion of male population and residents' housing demand

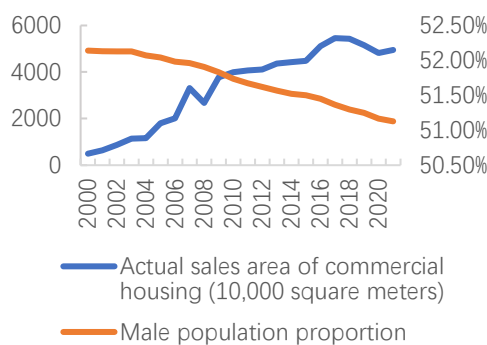


Fig. 4. The correlation between the proportion of male population and housing demand

As can be seen from the figure 4, since 2000, the proportion of male population in Chongqing has gradually decreased, from 52.14% in 2000 to 51.13% in 2021. The new era advocates equality between men and women, women's social status has been greatly improved, and the traditional concept of "son preference" has been slowly abandoned, so the gender ratio of men and women has gradually become more balanced, and the originally high proportion of men has begun to decline year by year. While the male sex ratio has declined, we have observed that the actual sales area of commercial housing in Chongqing is still increasing year by year. It can be seen that the gender ratio of the population is balanced, and the demand for housing of Chongqing residents is greater when it is close to 1:1.

3.2.2 The correlation between juvenile dependency ratio and housing demand

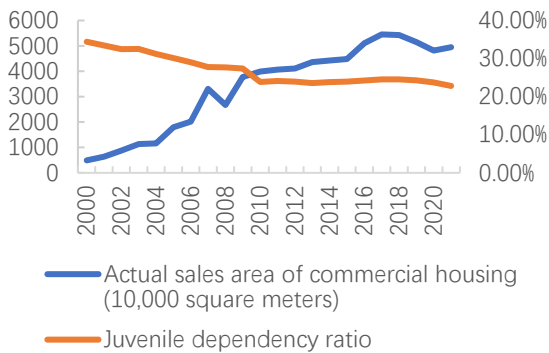


Fig. 5. Correlation between juvenile dependency ratio and housing demand

The juvenile dependency ratio is the proportion of the population aged 0-14 to the population aged 15-64. Research shows that the reduction of the child dependency ratio will not only reduce the cost of child rearing for the whole family and even the whole society, but also make more funds flow to the real estate market, pushing up the price of housing.

As can be seen from the figure 5, the juvenile dependency ratio in Chongqing dropped from 34.43 percent in 2000 to 22.83 percent in 2021. It shows that the inverted pyramid structure of Chongqing population is gradually emerging. The population between 0 and 14 years old is non-working population, and the reduction of the juvenile dependency ratio indicates that the cost of raising the juvenile population in the family may be reduced, and the purchasing power of residents for commercial housing may be increased. Therefore, the actual sales area of commercial housing in Chongqing increases year by year while the ratio of juvenile dependency decreases.

3.2.3 Correlation between elderly dependency ratio and housing demand

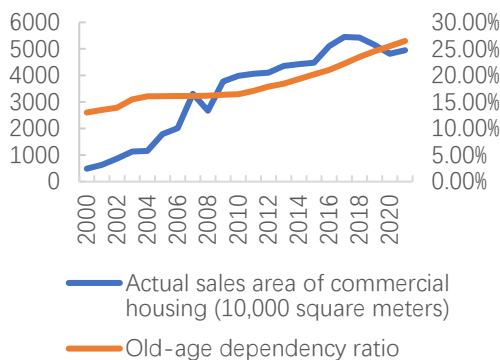


Fig.6. Correlation between elderly dependency ratio and housing demand

The old-age dependency ratio is the proportion of people aged 65 and over to those aged 15-64. Research shows that the elderly group's own housing demand will decline, but because the elderly who have experienced welfare housing distribution have sufficient savings and a strong willingness to transfer between generations,

resulting in an increase in the proportion of elderly people will increase the housing demand^[5]. That is, in China, the old-age dependency ratio is directly proportional to housing prices (or housing demand).

As can be seen from the figure 6, Chongqing's old-age dependency ratio rose from 13.04 percent in 2000 to 26.51 percent in 2021. The change of the old-age dependency ratio data shows that Chongqing's population structure is rapidly aging, which is also in line with the development trend of population inverted pyramid structure. Most of the older population is not in the labor force and generally has less purchasing power. However, the survey data show that while the elderly dependency ratio is rising rapidly, the residential housing demand is also increasing, and the actual sales area of commercial housing is increasing year by year. The reason may be because the elderly population, although most of them have no labor income, often have many years of savings, and often become the main consumer when facing the life event of "house purchase". It can be seen that the increase of the elderly population will not affect the housing demand of residents and even increase the sales area of commercial housing.

3.3 Correlation analysis of population social structure variables and residents' housing demand

Generally speaking, residential housing consumption has a family character, so the structure and scale of the family is a direct factor that affects and determines the size and structure of housing demand.

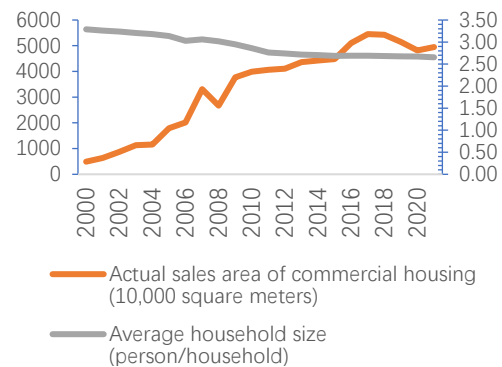


Fig. 7. Relationship between average household size and sales area of commercial housing

As can be seen from the figure 7, from 2000 to 2021, the average household size has gradually decreased, after more than 20 years, from 3.29 people per household in 2000 to 2.66 people per household in 2021. Under the condition that the total population is unchanged, the inevitable result of the miniaturization of family size is the increase of the number of households, which also means that the total amount and structure of housing demand in the market will have a certain impact. From the perspective of the relationship between the two, there is a reverse relationship, that is, with the reduction of family size, the sales area of commercial housing shows a trend of growth.

3.4 Correlation analysis of other control variables and residents' housing demand

3.4.1 Analysis of per capita income growth rate and commercial housing sales

The higher the per capita income, the more likely people are to invest to improve their living standards, and the real estate industry is a better investment, so there is a positive correlation between the growth level of per capita income and the demand for commercial housing. During the period from 2000 to 2010, the sales area of commercial housing in Chongqing fluctuated greatly, and fell to the bottom in 2008, showing a negative growth rate of 19.34%. The main reason is the spread of the impact of the international financial crisis, which has had an adverse impact on China's economic operation. As a pillar industry of the national economy, the real estate industry has received a huge spread, resulting in the market showing a flagging state. After the international financial crisis, the area of commodity sales in 2009 returned to the level of development in 2007, and then the growth rate showed a stable development trend. From the growth rate of per capita income, the growth rate from 2000 to 2021 is relatively flat, with an average growth rate of about 14.58%. The per capita income of residents is increasing day by day. In addition to the individual fluctuations of the transaction area of commercial housing in the real estate market in some years, the growth rate of per capita income of residents and the growth rate of commercial housing sales area show a positive development trend.

3.4.2 Analysis of urban-rural income ratio and commercial housing sales

The rural-urban income ratio and the sales area of commercial housing show a trend of reverse development. From 2000 to 2021, the urban-rural income ratio of Chongqing dropped from 3.26 to 2.4, indicating that the relative income gap between urban and rural residents has gradually narrowed, mainly due to the effective implementation of various policies of the state, provinces and cities. From the perspective of the changing trend of commercial residential sales area, it shows a steady increasing trend. Of course, the relationship between the change of urban-rural income ratio and the actual sales area of commercial housing is only reverse from the trend, but it cannot be proved that there is a direct correlation between the two. The reduction of urban-rural income gap is largely due to the impact of urbanization, especially in regions with high economic development level. This is because there are more job opportunities and higher wages in these areas, which makes the factor remuneration between urban and rural areas more equal. The improvement of the urbanization rate will increase the demand for commercial housing to a large extent, and promote the sales area of commodities to rise year by year. According to the research of many scholars, the widening income gap between urban and rural areas will not be conducive to the growth of regional real estate market demand, on the contrary, the narrowing of urban-rural gap

will have a favorable impact on the growth of regional real estate market demand^[6]. Therefore, from this perspective, the rural-urban income ratio, which reflects the urban-rural income gap, is obviously related to the demand of the real estate market.

3.4.3 Analysis of commodity housing prices and sales

There is a positive development relationship between the trend of residential commodity prices and the area of commercial residential sales. This phenomenon shows that the more prosperous the real estate market, the more commercial housing transaction area, and the higher the price of residential goods. At the same time, with the annual growth of housing commodity prices, the sales area of commercial residential buildings has not been inhibited. Similarly, at the onset of the financial crisis in 2008, the floor area of commercial residential property sales was declining, but the price level remained strong, but the growth rate of commercial residential property prices slowed to only 2%. In 2009, the growth rate of commodity housing prices increased rapidly to 23.71%.

There is a consistent relationship between the growth rate of commodity housing prices and the growth rate of commercial housing sales area. At the same time, it should be noted that the sales area of commercial housing is affected by many factors. For example, from 2014 to 2015, Chongqing issued a relatively strict real estate market regulation policy, and destocking became one of the key points of regulation at that time^[7]. Therefore, during this period, the price trend of commercial housing was low, while the sales area of commercial housing was relatively stable. After the financial crisis in 2008, housing prices showed a new upward trend, but the sales area of commercial housing did not increase greatly due to the steep increase in housing prices, which also shows that residents have a strong wait-and-see attitude.

3.4.4 Analysis of newly started residential area and commercial residential sales

From 2000 to 2009, the area of newly started commercial housing and the area of commercial housing sales showed a relatively consistent trend, indicating that during this period, the relationship between supply and demand in Chongqing's real estate market was relatively balanced. From 2009 to 2011, real estate speculation led to the bubble of the real estate industry, and the scale of land acquisition, development and construction by developers showed a rapid growth trend. From 2014 to 2015, the keynote of the real estate market was destocking, so the newly started residential area fell sharply. After 2016, the housing price showed a new round of rise. The area of new housing starts has picked up again, peaking in 2018 and then declining. At the same time, the sales area of commercial housing has maintained a relatively stable growth trend. This shows that the sales area of commercial housing and the newly started housing area are consistent when the market supply and demand are relatively balanced, but under the influence of real estate policy

regulation, they will produce a relatively inconsistent development trend.

4. Questions and Suggestions

4.1 Optimize the development of Chongqing's real estate industry according to the change of population structure

4.1.1 Maintain the "demographic dividend" based on Chongqing's own advantages

The development prospects of a city's real estate market depend on policies in the short term, land supply in the medium term, and population in the long term. Therefore, the prosperity of the real estate market cannot be separated from the "demographic dividend". In the future, Chongqing should take advantage of the key construction tasks of urbanization in the Chengdu-Chongqing economic Circle, continue to maintain its new attraction for talents and population, further enhance the status of the city, stabilize the real estate market with the "demographic dividend", and stabilize the development of real estate and its upstream and downstream industries.

4.1.2 Vigorously develop "senior real estate" to cope with the aging population trend

Chongqing has a large number of elderly people and a high old-age dependency ratio, so there is a large demand for old-age real estate. Real estate development companies should fully consider the needs of elderly real estate in Chongqing, start from the overall design and design of elderly real estate buildings, residential design, supporting service facilities, property management services and other aspects, and develop "elderly real estate" that is truly suitable for elderly people to live in. This is not only a breakthrough for the future development of the real estate industry, but also of great significance for building a harmonious aging society.

4.1.3 Optimize the housing structure according to the change of the average household population size

The survey data show that the average household population size in Chongqing is gradually declining. Therefore, it is suggested that in the design of household products, small and medium-sized households that can meet the needs of 2-3 families should be given priority, while taking into account the improvement needs of small-scale families.

4.1.4 Improve the quality of urbanization construction on the basis of "high urbanization rate"

A large number of agricultural population has changed to urban population, which is an important symbol of Chongqing's modernization development and an important achievement of economic development.

However, we need to pay attention to the fact that the urbanization development of Chongqing cannot take the old road of extensive expansion, but must find a new way of urbanization. Only high-quality new urbanization can truly make the population "come in" and "settle down", form a stable urban population, and then maintain the "demographic dividend" of the city, and inject energy into the stable development of the real estate market.

4.2 Guide the reasonable demand of the housing market and curb the demand for real estate investment

4.2.1 Strengthen the implementation of differentiated credit policies

While financial institutions continue to support residents to purchase ordinary self-owned houses with loans for the first time, they should strictly manage loans for the purchase of second homes, rationally guide housing consumption, and curb investment and speculative housing demand. For families (including borrowers, spouses and minor children) who have used loans to buy housing and apply to buy a second or more housing, the loan down payment ratio shall not be less than 40%, and the loan interest rate shall be priced strictly in accordance with risk.

4.2.2 Continue to implement differentiated housing tax policies.

It is necessary to strictly implement the state's differentiated tax policies on individual purchases of ordinary housing and non-ordinary housing, first-time purchases and non-first-time purchases, and grasp the tax burden in the process of improvement and adjustment. For those who do not meet the prescribed conditions, no relevant tax incentives shall be given. At the same time, it is necessary to speed up the study and improvement of housing tax policy, and guide residents to establish a reasonable and economical housing consumption concept.

4.2.3 Precise policies were adopted to guide housing selection

Precise policies to guide the selection of housing, respectively, to solve the problem of living, living livable and job-housing balance, these three goals can be said to be progressive. Precise policy should grasp the following four core contents: First, it is necessary to accurately identify the rental and purchase needs and product characteristics needs of different subjects from the perspective of housing payment ability and housing consumption preference; Second, precise regulation, different housing, different buyers, different cities to adopt different regulation policies; The third is accurate supply, based on the housing demand of rental purchase selection and product characteristics selection, accurate supply of rental housing and commercial housing with different physical characteristics, supporting facilities and public

services; The fourth is accurate security, with income level and per capita area as the basic standard, comprehensive family economic burden and other factors, to build a dynamic housing security system with public rental housing, common property rights housing and affordable rental housing as the main body, to meet different levels of housing needs.

4.3 Continue to optimize the housing security system to meet the housing needs of the floating population

4.3.1 Gradually lower the threshold of access and expand the scope of protection

The housing security coverage will be extended to middle-income families with housing difficulties in Chongqing, migrant workers with stable employment in Chongqing, newly employed college students, young doctors, young teachers and other professional and technical personnel, which is in line with the public rental housing access conditions of Chongqing residents and included in the scope of public rental housing security. We will encourage and guide the procurement of public rental housing and other related services from the market through the purchase of services or the cooperation model between the government and private capital, and optimize the eligibility conditions for housing security recipients.

4.3.2 Promote the reform of monetizing housing security

The rental subsidy system should be established and improved and dynamically adjusted, and the scale and object of public rental housing subsidy should be reasonably determined according to factors such as Chongqing's economic development level, real estate market situation, government financial affordability, housing security object demand and public rental housing distribution. First, we can support the recipients of housing security to rent or buy housing in the market by issuing rent subsidies, rent vouchers, long-term leases, etc. The second is to encourage the use of house purchase subsidies, loan discount interest, rental subsidies and other monetized security methods to solve the housing problem of high-level talents.

4.3.3 Expand the sources of land for affordable housing

In accordance with the principle of policy support from the government, multi-subject investment and multi-channel supply, we will use collective construction land, idle land owned by enterprises and institutions, supporting land for industrial parks, unused houses for reconstruction, new supply of state-owned land, planned commercial reconstruction, planned industrial reconstruction, commercial housing allocation and other channels to build affordable rental housing in Chongqing, and improve the

approval efficiency. We will actively promote the implementation of affordable housing projects.

4.3.4 Actively promote the dual-track measures of renting and purchasing simultaneously

The simultaneous development of rent and purchase means that housing leasing will play a more important role in solving the housing problem. Therefore, it is necessary to solve the problem of "selling one leg long and renting one leg short" for a long time. We will accelerate efforts to make up for shortcomings in housing leasing and the introduction of various rules and regulations. Driven by the demand for rental housing in the market, under the guidance of relevant policies, the housing rental market has developed more mature and perfect, and better meets the rental housing needs of the masses, especially the new citizens and young people.

4.4 Improving fertility incentive policies to slow the decline of the population

4.4.1 Implement differentiated individual tax deduction and economic subsidy policies

The government should explore the establishment of a comprehensive system to encourage childbirth from pregnancy care to pregnancy delivery to the age of 18 or the end of academic education, including pregnancy care subsidies, hospital delivery subsidies, childcare allowances, education allowances, family tax credits, and direct financial subsidies for low-income people who do not meet the standards for paying personal income taxes.

4.4.2 Increase the supply of childcare services

We will vigorously increase the enrollment rate of children aged 0-3, and provide subsidies for intergenerational care. We strongly encourage and support employers and social forces to set up infant and child care service institutions, and form various forms of service networks such as full-day care, half-day care, hourly care and temporary care. At the same time, subsidies are provided to grandparents who take care of other generations, so as to enhance the enthusiasm of grandparents to take care of other generations and reduce the pressure of parents.

4.4.3 Further improve the protection of women's rights and interests in employment

We will give preferential tax treatment to enterprises for childbirth, and accelerate the establishment of a reasonable and effective mechanism for sharing the cost of childbirth among the state, enterprises and families. On the one hand, we will further promote the implementation of maternity leave and lactation leave systems, properly address the extension of maternity leave and paternity leave for men, and impose economic or administrative penalties on units that harm women's employment rights and interests. On the other hand, according to the size of

female employees and the annual birth situation of the unit, the implementation of a certain degree of tax incentives to reduce the cost of birth borne by the enterprise.

4.4.4 Improve the top-level design of assisted reproduction

Families in need will be given targeted subsidies for assisted reproduction, and reasonable demand will be fully released. Optimize relevant laws and regulations, introduce a package of relevant regulations, and open up the barriers between technology, ethics and laws related to assisted reproduction. Encourage independent research and development of reagents related to assisted reproduction and reduce import dependence; Through the establishment of personnel exchange mechanism, promote the sharing of high-quality resources among regions. Encourage relevant institutions to build professional personnel training mechanisms, provide subsidies for talent cultivation, and improve the proportion and professionalism of the overall doctor service personnel. Allowing single women to freeze their eggs will help them preserve their fertility and give women equal reproductive choices.

5. Conclusion

This study analyzes the housing demand of Chongqing residents from the aspects of population regional structure variable, population natural structure variable, population social structure variable and other control variables, and puts forward constructive suggestions from many aspects and perspectives, such as real estate industry optimization, residents' reasonable housing demand guidance, housing security system construction, and fertility policy incentive. The empirical study on the influence of population structure on residents' housing demand in Chongqing is of great practical significance. This study plays a positive role in the healthy development of Chongqing real estate industry, and provides an important basis for the government's macro-control and supply of Chongqing real estate market.

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