

# Study on the Development Situation and Improvement Countermeasures of Real Estate Industry in Shandong Province

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**Abstract:** The real estate industry in Shandong Province is facing the Matthew effect of overheating in the core cities and overcooling in the peripheral cities, highlighting the deep-seated contradiction of institutional changes lagging behind market changes. The industry's pain points include the inefficiency of infrastructure investment due to the dependence on land finance, the risk of hollowing out of the industry caused by the "real estate + culture and tourism" model, and the vicious cycle of population loss and rising housing vacancy rate in counties. At the institutional level, the urban-rural dual land system restricts the market allocation of land elements, and the shortcomings of the fiscal and taxation system aggravate the local dependence on land finance. Market conflicts are reflected in the structural imbalance between the surplus of high-end housing and the insufficient supply of subsidized housing, and speculative demand continues to disturb the "housing without speculation" positioning. At the risk level, the liquidity crisis of small and medium-sized real estate enterprises has penetrated into the financial system, and the high leverage of the residential sector has further squeezed the consumption potential. Research recommendations: (1) Deepen the reform of the land system, and build a "people, land and money linked" dynamic matching mechanism. (2) Accelerate the landing of the pilot property tax to optimize the real estate tax structure. (3) Implement "one city, one policy" precise control, and promote the integration of real estate with intelligent manufacturing and health care industry. (4) Establish a credit grading management system for real estate enterprises and a penetrating supervision system for pre-sale funds to prevent systemic risks and realize high-quality development of the industry.

**Keywords:** Real Estate Industry; Shandong Province; Matthew Effect; People, Land and Money Linked; Improve Countermeasures

## 1. Introduction

After China's economy has entered a new normal development stage, the real estate industry is undergoing a profound functional transformation and structural remodeling. The traditional investment-driven and land finance development model is unsustainable, and the industry is gradually returning to the residential property of "housing without speculation", reflecting the core concept and tone of China's long-term economic development in the future, and pointing out the direction for China to build a long-term mechanism for the development of the real estate market and to promote the high-quality development of the economy <sup>[1]</sup>, and showing three major characteristics of the transformation: first, the transformation of the development of the kinetic energy, from the expansion of incremental to the optimization of stock, urban renewal, rental and purchase have become new growth poles. First, the transformation of development momentum, from incremental expansion to stock optimization, urban renewal, rent and purchase has become a new growth pole. Second, the expansion of industrial boundaries, from a single residential development to the extension of pension real estate, industrial real estate, logistics real estate and other composite business. Third, the weakening of financial attributes, in the "three red lines" constraints, real estate development enterprises (hereinafter referred to as real estate enterprises) leverage continued to decline, the business model to the logic of the manufacturing industry to return. In the process of transformation, the pattern of regional differentiation is becoming more and more significant, the eastern coastal region is the first to enter the era of inventory, the central and western regions are still facing the pressure of de-inventory, the urban and rural disparity presents a coexisting situation of "polarization of the city circle" and "contraction of the county".

Shandong Province, as the third largest province in China in terms of economy and the second largest province in terms of population, its real estate development is characterized by unique dual attributes. From the economic dimension, the transformation of old and new kinetic energy is an important task to promote the high-quality development of the economy in Shandong Province<sup>[2]</sup>, the transformation and upgrading of traditional manufacturing industries and the cultivation of new industries, the development of the ten advantageous industrial clusters puts forward a new demand for industrial carriers, but structural contradictions caused by the high proportion of traditional industries such as iron and steel, coal, and so on, have made some cities and municipalities face the risk of "decoupling" between economic growth and real estate investment. From the population dimension analysis, in 2024, Shandong urbanization rate has exceeded 65%, but there are significant regional differences: Qingdao, Jinan metropolitan area showed a positive cycle of "net inflow of population-house price rise", while Heze, Liaocheng and other net outflow of population in the region fell into the "high inventory - low demand" predicament. The interaction between the transformation of old and new kinetic energy and the process of urbanization makes the real estate development in Shandong not only have the common characteristics of the eastern coastal provinces, but also present the special rules of industry-dependent economies. At present, China's real estate market is facing the dual tasks of "preventing big ups and downs" and "building a new model", and an in-depth deconstruction of a typical province like Shandong, which has both economic weight and transformation pressure, would be of policy revelation significance that goes beyond the provincial boundaries to provide China's solutions for the high-quality development of real estate in the new era.

## **2. Diagnosis of the development status of the real estate industry in Shandong Province**

### ***2.1 Operational characteristics of the market***

#### ***2.1.1 Spatial Differentiation: Coexistence of Qingdao and Jinan Dual Core Concentration and Inventory Removal Pressure in Third- and Fourth-Tier Cities***

Shandong Province is an important growth pole for China's regional economic development<sup>[3]</sup>, and its real estate market shows a typical spatial pattern of "dual-core drive and multi-polar differentiation". Qingdao and Jinan, as the two core cities, have formed a high concentration of population, capital and industry, relying on the superimposed advantages of national strategies (e.g. Qingdao SCO Demonstration Zone and Jinan Old and New Dynamic Conversion Starting Area). 2023 data shows that the sales area of commercial real estate in Qingdao and Jinan accounted for 37.6% of the province's total, but with significant differences in the growth rates. In Qingdao, driven by the ocean economy and foreign capital inflow, the house price-to-income ratio climbed to 9.8, close to the level of first-tier cities. Jinan is driven by the CBD construction and provincial capital strategy, high-end residential projects to shorten the cycle to 8.2 months. In sharp contrast, Heze, Liaocheng and other third- and fourth-tier cities are facing deep differentiation. On the one hand, the inventory depreciation cycle generally exceeds 20 months, and some county markets reach more than 36 months. On the other hand, the net outflow of population led to the shrinkage of rigid demand, and the wave of home purchase due to the impact of the epidemic and the economic downturn is expected to weaken, the formation of "price but no market" stalemate situation.

#### ***2.1.2 Structural contradiction: the paradox of growing demand for improvement and insufficient supply of subsidized housing***

The structure of housing demand in Shandong Province is undergoing a fundamental transformation. Population, as the elemental flow of urban development, is an important foundation for social development<sup>[4]</sup>. According to the seventh census data, the average household size in the province has dropped to 2.7 people, promoting the upgrading of small households to improved housing. 2023, the proportion of large households in the transaction has been increasing, of which the four-bedroom products in the Hanyu area of Jinan and Laoshan District of Qingdao have a higher rate of demobilization. However, the guaranteed housing supply presents a "triple imbalance": First, the total supply is insufficient, the province's guaranteed rental housing only completed the "14th Five-Year Plan" 42.7% of the target. Secondly, the space mismatch, Jinan Lixiong District, Qingdao Licang District, and other foreign population densely populated areas of protected housing accounted for less than 8%. Third, the product mismatch, the existing security housing to 60 square meters below the type of household, difficult to meet the needs of new citizens family structure. Structural contradictions have given rise to two major market distortions: First, the commercial housing market shows a tendency of "high-end", the average total price of new homes in Qingdao's main urban areas exceeded 3.5 million

yuan, resulting in the middle-income group to buy a home affordability index fell to 62, below the reasonable range. Secondly, the rental market is lagging behind, far below the average level of the Yangtze River Delta and Pearl River Delta, forcing new citizens to bear high private rental costs. The deeper impact is that the housing security gap directly restricts the quality of urbanization. In 2023, the urbanization rate of Shandong's resident population will reach 65.8%, but the urbanization rate of the household population will be only 57.3%, a gap of 8.5 percentage points reflecting the plight of "semi-urbanization".

### ***2.1.3 Financial linkages: regional differences in the share of real estate loans and the risk of bond defaults by real estate companies***

Real estate financial risks in Shandong Province show significant geographical heterogeneity. In terms of credit structure, the real estate loan balances of Qingdao and Jinan accounted for 61.4% of the province's total, but the non-performing loan ratio was controlled at less than 1.2%, thanks to their strong collateral bases and strong borrower solvency. On the contrary, in third- and fourth-tier cities, the concentration of real estate loans of some agribusiness banks exceeded the regulatory red line of 40%, such as the real estate loans of a certain agribusiness bank in Heze accounted for 43.7%, which was significantly higher than the systemically important bank ceiling of 27.5%. The above regional differences stem from the fact that core cities have low volatility of house prices and stable collateral values, while third- and fourth-tier cities have higher volatility coefficients of house prices, leading to climbing risks of collateral impairment.

The bond default risk of real estate enterprises also shows a gradient distribution. In 2023, in Shandong Province, a total of seven real estate enterprises defaulted on their bonds, six of which are medium-sized real estate enterprises registered in third- and fourth-tier cities. The root cause of default lies in: first, the financing structure is unbalanced, the average non-standard financing ratio of defaulted real estate enterprises reaches 38%, much higher than the industry average. Second, the project layout is centralized, 82% of the projects of defaulted real estate enterprises are located in a single city, which makes it difficult to diversify risks through regional hedging. Third, the dependence on political and business relations, some real estate enterprises acquired low-priced land through the promise of supporting schools, commercial, etc., but it is difficult to fulfill the promise in the downturn of the market, resulting in the stagnation of the project.

## ***2.2. Analysis of industry pain points***

### ***2.2.1 Land finance dependency: the dynamic link between local government land transfer revenues and infrastructure spending***

The dependence of local governments on land finance in Shandong Province has formed a path-locking effect. In 2023, the proportion of land transfer revenue in government fund budget revenue in the province amounted to 78.6%, with the cities of Linyi and Dezhou accounting for more than 85% of the total. This dependence is transmitted to the real estate industry through three paths: First, the land grant revenue directly constitutes the main source of urban infrastructure investment, in 2023, Shandong Province, urban construction funds in the land grant proceeds accounted for 62.3%, the formation of "land financing - infrastructure investment - land value added" circular logic. Second, the land grant price has become the core variable of the composition of housing prices, Qingdao, Jinan, the main city land transactions floor price to house price ratio of 0.68 and 0.63, significantly higher than the reasonable range. Third, land finance drive local governments to regulate the market temperature by controlling the pace of supply, such as Zibo City in the third quarter of 2023 through the "centralized land supply" strategy to make the land premium rate soared from 2.1% to 18.7%.

### ***2.2.2 Risk of hollowing out the industry: the sustainability of the "real estate+cultural tourism" model in some cities is doubtful***

Under the pressure of the transformation of traditional industries, Weihai, Rizhao and other coastal cities commonly used "real estate+ cultural tourism" development model, but the model faces three major sustainability challenges: First, the mismatch of the return on investment cycle, the average payback period of the cultural tourism project is as long as 8-10 years, while the residential sales of the capital back to the 2-3 years, forcing developers to take the "residential feedback cultural tourism" financial strategy. The average payback period of a cultural tourism project is 8-10 years, while it takes only 2-3 years for residential sales to recoup funds, forcing developers to adopt the financial strategy of "residential feedback cultural tourism", which has led to the downsizing of supporting facilities for projects such as Weihai Naxianghai and Rizhao Dongfang Sun City. Second, the customer group

positioning deviation, over-reliance on foreign home buyers, such as Nushan Silver Beach Resort, foreign home buyers accounted for 82%, but after the epidemic cross-provincial demand for housing shrinkage, resulting in the vacancy rate climbed to 68%. Third, the homogenization of competition is serious, the province in the construction of cultural tourism real estate projects amounted to 172, of which 71% of the seascape housing projects, product similarity is as high as 83%, into the "price war" quagmire.

### ***2.2.3 Weakening demographic support: the vicious circle of county outflow and rising housing vacancy rates***

County population loss in Shandong province presents "two-speed loss" characteristics: traditional agricultural counties such as Cao County, single county annual average population outflow rate of 3.2%, and resource-depleted counties such as Xintai, Zouping due to industrial contraction led to population loss rate as high as 4.7%. Population loss leads directly to the shrinking demand for housing, the province's county housing vacancy rate is rising. More serious is that the vacant house into a "zombie assets", hindering the market allocation of land elements. To a county in Heze City, for example, its city south of the new area planning population of 100,000 people, but the actual occupancy rate of less than 25%, resulting in supporting schools, commercial facilities have been idle for a long time, the government had to invest financial resources every year to maintain operations.

## **3. Key challenges and deep-rooted conflicts**

### ***3.1 Institutional barriers***

#### ***3.1.1 Constraints of the dual urban-rural land system: slow progress in the market entry of collective operational construction land***

The urban-rural dual land system has become the core shackle restricting the market-oriented allocation of land elements in Shandong Province. Although the new Land Management Law provides a legal basis for the market entry of collective operational construction land, which is a milestone for China to build a unified construction land market between urban and rural areas [5]. However, the pilot practice in Shandong Province has revealed three deep-seated contradictions: first, the rigidity of the revenue distribution mechanism. The current 4 policy requires local governments to extract the adjustment fund according to 20%-50% of the land appreciation gain, resulting in the actual rate of return of the collective economic organization is only 35%-50%, which is significantly lower than the compensation standard of land expropriation. Zichuan District, Zibo City, for example, a collective commercial land into the market, the village collective final earnings only accounted for 38% of the land value-added gains, lower than the surrounding state-owned land transfer proceeds of 52%, a serious disincentive to enter the market enthusiasm. Second, the lack of financial support. Into the market plot due to ownership registration, value assessment system is not perfect, can not apply for mortgage registration, resulting in the loss of financing function. The province's 17 pilot counties, only three cases through the "collective construction land use right mortgage + guarantee company credit" mode to obtain loans, financing less than 40% of the assessed value of the plot, much lower than the 70% mortgage rate of state-owned land. Third, the rigid constraints of planning and control. Plots entering the market need to be in line with the national land spatial planning, but the province's village planning coverage is low, and most plans do not specify the layout of collective construction land. In the pilot project in Yucheng City, Dezhou, the project was put on hold for 18 months due to the lack of superior planning, which resulted in the land to be entered into the market being designated as permanent basic farmland protection zones.

#### ***3.1.2 Deficiencies in the fiscal and tax system: lack of local main tax sources in the absence of property tax pilots***

Shandong Province fiscal and taxation system has structural defects, highlighted by the lack of local main taxes and real estate tax system imbalance. The province's local tax system, real estate-related taxes accounted for 37.4%, but the tax structure shows "polarization": First, the flow of the link is too heavy. Deed tax, land value-added tax and other turnover taxes accounted for as high as 68%, of which the cost of second-hand real estate transaction taxes and fees amounted to 8.6% (including deed tax, value-added tax and surcharges, and personal income tax), significantly higher than the level of 3%-5% in developed countries. This tax system design stimulates short-term speculative behavior, forming a vicious circle of "active transactions-sufficient tax sources-dependence on deepening". Second, the retention segment is too light. Property tax accounts for only 4.1% of the real estate tax revenue, and

the pilot scope is limited to the enterprise's own use of property, personal housing tax exemption. The deeper financial and tax contradiction lies in the fact that relying on land finance in the short term can suppress the expansion of implicit debt <sup>[6]</sup>, but it also leads to a dilemma for local governments in implementing regulatory policies: they need to curb the rapid rise of housing prices while maintaining the heat of the land market to ensure fiscal revenue. For example, some cities have linked demolition compensation to specific real estate sales through the "housing ticket" resettlement system, which can alleviate inventory pressure in the short term, but also lead to greater fiscal pressure in the current period <sup>[7]</sup>.

### **3.2 Market-based conflicts**

#### **3.2.1 Mismatch between supply and demand: structural imbalance between the surplus of high-end residential housing and the insufficient supply of secure rental housing**

Shandong Province housing supply system is caught in the "high-end excess- protection of the lack of" double predicament. In the commercial housing market, more than 140 square meters of large family inventory of 23.14 million square meters, according to the current sales rate of 31.2 months to digest, of which a villa project in Laoshan District, Qingdao, the unit price of more than 100,000 yuan / square meters is still lagging behind, the rate of depletion of only 12%. In sharp contrast, 70 square meters of small rental housing accounted for only 12.4% of the market stock, new citizens "a room" to meet the demand rate of less than 40%. Structural imbalance in the field of protected housing is more prominent: first, the total supply gap. According to the "14th Five-Year Plan", Shandong Province needs to build 400,000 sets of guaranteed rental housing, but by the end of 2023, only 172,000 sets had been completed, a completion rate of 43%. Among them, Jinan, Qingdao and other cities with net population inflow gap amounted to 68,000 sets and 53,000 sets, resulting in per capita housing area of migrant workers is only 14.6 square meters, which is lower than the national standard of 3.2 square meters. Second, the spatial layout is misaligned. Of the completed protected housing, 68% is located in new areas on the periphery of the city, while the supply of employment-intensive areas (e.g., Jinan CBD, Qingdao High-Tech Zone) accounts for only 28%. A housing project in Linyi City has an occupancy rate of less than 35% due to high commuting costs, resulting in a waste of resources that are "built but not used". Secondly, the defect of product adaptation. Existing sheltered housing is mainly dormitory-type, with less than 15% family-type products, making it difficult to meet the needs of new citizens for marriage and parenthood.

#### **3.2.2 Failure of expectation management: the game between speculative demand and "housing without speculation" positioning**

Although "housing without speculation" has been reflected the core concept and tone of China's long-term economic development in the future<sup>[8]</sup>, the real estate market in Shandong Province is still characterized by significant speculative impulses. Speculative behavior presents three new features: first, the variation of capital channels. After the restriction of traditional down-payment loans, speculative funds have shifted to business loans, consumer loans and other channels. A joint-stock bank in Qingdao branch of personal business loan balance, 37% flow to the real estate sector, of which 63% through the shell company to obtain loans. In Rizhao City, there is even a "home buyer-intermediary-financial institutions" industry chain, through the fake business water to obtain loans. Second, the transaction mode innovation. "Holding the purchase of real estate" has become a new means of circumventing the purchase restrictions. Through the property gift between relatives, marriage and divorce, Qingdao on behalf of the growing number of cases of home purchase, a high-end real estate buyers, no local household registration and no social security records accounted for 29%. Third, the failure of expectation guidance. Local government regulatory policy there is a "signal disorder". For example, Weifang City in the first quarter of 2023 introduced the "home purchase subsidy" policy, the second quarter and urgently called a halt, resulting in repeated market expectations. More alarming is that part of the media through the rendering of "school district housing concept" "subway planning" and other manufacturing anxiety, Qingdao, a school district housing project in the policy window period price increase of 17%, far more than the CPI growth rate. Expectation management failure of the deep-seated reasons are: First, the policy toolbox there is "heavy administrative, light economic" tendency, restrictions on purchases, restrictions on lending and other administrative means easy to be circumvented, while the property tax, vacancy tax and other economic levers are absent. Secondly, local governments have "control phobia", worrying that excessive suppression of the market will affect the income from land sales, leading to a tendency of "implicit protection of rigid demand" in the implementation of policies. Third, market information transparency is insufficient, and some counties and cities have set up accounts for the supervision of commercial

property pre-sale funds, making it difficult to detect violations in a timely manner.

### **3.3 Risk potential**

#### **3.3.1 Transmission of debt risk of real estate enterprises: regional liquidity crisis of small and medium-sized real estate enterprises penetrating the financial system**

Shandong Province real estate enterprise debt risk has broken through the industry boundary, showing the transmission trend to the financial system penetration. The province's real estate enterprise gearing ratio is significantly higher than the industry average. This risk is transmitted to the financial sector through three paths: first, trust financing default chain reaction. Shandong, a local real estate enterprises by forging the project pre-sale funds regulatory account flow, from three trust companies to obtain financing 2.36 billion yuan, and ultimately due to the lack of sales returns led to the suspension of the project, triggering a chain of trust products default. This "capital pool" mode of operation makes the risk of a single real estate enterprise evolve into a regional financial risk. Second, the commercial paper payment crisis triggered payment system shock. In Weifang City, a subsidiary of a TOP100 real estate company was sued by 37 suppliers for refusing to pay commercial paper, which led to the extension of accounts payable turnover days in the local construction industry to 182 days, and the cash flow of small and medium-sized enterprises was on the verge of breakage. More seriously, commercial paper defaults have spread to municipal investment platforms, with the credit rating of a municipal urban investment company downgraded to AA-due to bad debt losses of 870 million yuan in real estate receivables. Third, the guarantee chain risk triggers regional financial risks. The amount of mutual guarantee of real estate enterprises in Shandong Province accounts for 38% of the total guarantee, forming a complex risk network. In Zibo City, the top ten real estate enterprises through mutual insurance to achieve financing 13.2 billion yuan, but a leading real estate debt default led to the guarantee chain of six enterprises credit rating was downgraded, involving bank loans of 7.6 billion yuan. This "domino" effect makes a single enterprise risk evolve into a regional financial risk.

#### **3.3.2 Imbalance in the house price-to-income ratio: pressure on residents to buy houses in key cities versus international warning lines**

Key cities in Shandong Province, the house price to income ratio has exceeded the reasonable range, the formation of "home purchase debt - consumption shrinkage" of the vicious circle. Qingdao, Jinan house price to income ratio of more than the internationally recognized 3-6 times the reasonable level<sup>[9]</sup>. This imbalance presents three major features: first, the actual pressure to buy a home is significantly underestimated. If the provident fund loans, parental support and other factors into the calculation, Qingdao, the actual leverage ratio of the first suite of 7.3 times. To the city's Shibei District, for example, 90 square meters of household type total price of 3.15 million yuan, homebuyers need to use "six wallets" to pay the down payment of 68%, of which 43% of families need to mortgage parents' property to raise funds. Second, hidden liabilities exacerbate systemic risk. The province's residential sector leverage ratio reached 72.4%, higher than the average level of emerging market countries. In Jinan, the average loan-to-value ratio of home buyers reached 68%, with the mortgage-to-income ratio of the 35-44 year-old group reaching 4.2, significantly exceeding the central bank's recommended 3 times the warning line. High leverage has reduced residents' propensity to consume to 61.3%, down 5.7 percentage points from 2019, forming a negative cycle of "home purchase debt-consumption shrinkage". Third. Intergenerational equity imbalance. Rising house prices have led to the solidification of the intergenerational transfer of wealth, Qingdao, Jinan household registration households home ownership rate of 83.7%, while the ownership rate of new citizen households is only 32.4%. More seriously, high housing prices have forced young people to delay marriage and childbearing<sup>[10]</sup>, with the province's age at first marriage delayed by 3.2 years compared with 2010, and the total fertility rate dropping to 0.98, which is lower than Japan's level at the same time.

## **4. Improving the response**

### **4.1 Building a mechanism for "linking people, land and money": matching the dynamics of land supply and population mobility**

In response to the deep-rooted contradiction between population mobility and the mismatch in land resource allocation in Shandong Province, there is an urgent need to build a dynamic control mechanism that "links people, land and money". The core essence of this mechanism lies in realizing the precise matching of land supply indicators, financial transfer payments, household registration

access policies and population mobility trends, with specific implementation paths including:

First, a three-dimensional population monitoring system has been established. Integrate cell phone signaling, social security payment, water, electricity and coal consumption data to build a three-dimensional monitoring platform of "resident population - floating population - household population", realizing real-time tracking of population movement at the county scale. Second, implement differentiated land supply strategies. Based on the results of population monitoring, establish a dynamic adjustment mechanism of "incremental supply in population inflow areas and inventory revitalization in population outflow areas". For Jinan, Qingdao and other cities with continuous population inflow, the proportion of residential land in the annual land supply plan should not be less than 35%, and the cross-regional indicator trading of "land follows people" should be explored. For Heze, Liaocheng and other cities with population outflows, the implementation of the "industrial projects on the building" policy, inefficient industrial land plot ratio to 2.0 or more, and release construction land indicators for ecological restoration. Third, optimize the financial transfer payment system. Provincial fiscal transfers should be linked to population flows, with special subsidies for education and health care increased for cities with net population inflows, and a "shrinking city transformation fund" established for cities with outflowing populations.

#### ***4.2 Differentiated regulation and control: establishment of a "one city, one policy" precise indicator system***

In view of the regional market differentiation characteristics of Shandong Province, it is necessary to build a dynamic control framework that includes core indicators such as house price increase, depopulation cycle, and residents' leverage rate, to realize the closed-loop management of "early warning-response-assessment": firstly, multi-dimensional indicator system construction. Anchoring mechanism for house price increase: take "GDP growth rate+CPI growth rate" as the benchmark, and set the upper limit of annual house price increase in core cities (e.g., Qingdao and Jinan not exceeding 5.5%), and not exceeding 7% in third- and fourth-tier cities. The introduction of "house price to rent ratio" early warning indicator, for more than 1:400 urban areas to start the loan restriction code. Dynamic control of depolymerization cycle: 12-18 months as a reasonable interval, more than 18 months for cities to suspend new land supply, less than 12 months for cities to increase the supply of hotspot segments. Resident leverage red line control: set the balance of personal housing loans/GDP proportion does not exceed 45% of the cordon, the implementation of "recognize housing and loan" strict policy for cities exceeding the limit. The province's residential sector leverage ratio has reached 72.4%, the need for "debt restructuring plan" will be highly indebted families loan repayment expenditures/income ratio down to below 40%. Second, a differentiated policy toolbox. Core cities: Qingdao and Jinan have implemented the "double-limit+ double-race" rule (limit house price, limit land price, bidding for quality, bidding for construction), to control the land premium rate within 15%. Pilot "shared property rights housing 4.0" model, allowing buyers to purchase a share of property rights in stages. Third-and fourth-tier cities: Heze and Liaocheng have implemented the "Housing Voucher 2.0" system, which ties compensation for demolition and relocation to the purchase of new homes in a specific area, and extends the period of use of housing vouchers to 24 months. For counties and cities with an inventory depreciation cycle of more than 24 months, real estate enterprises are allowed to adjust the proportion of household structure and relax the requirements for the allocation of households of less than 90 square meters. County market: Cao County, Shan County and other outflow counties to establish a "housing voucher" system, farmers into the city to buy a home can be subsidized by 5%-8% of the price of the house, and synchronized with the promotion of the household registration system reform, to ensure that the education, health care and public services with the people go. Third, intelligent control platform construction. Build "Shandong Province real estate big data hub", integration of real estate registration, provident fund loans, water, electricity, gas and other data, to achieve "one house, one code" full life cycle management.

#### ***4.3 Credit Rating Management of Real Estate Enterprises: Constructing Red, Orange, Yellow and Blue Risk Early Warning Models***

In view of the debt risk transmission characteristics of Shandong Province real estate enterprises, it is urgent to establish a credit grading management system covering the whole life cycle, the core of which is to build a "red, orange, yellow and blue" four-color risk warning model: first, a multi-dimensional assessment index system. Financial Resilience Index: This index includes core indicators such as cash-to-short-debt ratio (25% weighting), net debt ratio (20%), and gearing ratio

after excluding advance receipts (20%). Real estate companies with cash-to-short-debt ratio  $<1$  are directly included in the red alert. Project Operation Index: covers project completion rate (15%), sales realization rate (10%) and customer satisfaction (10%). Orange Alert is applied to projects with completion rate  $<70\%$  and realization rate  $<50\%$ . Market reputation index: through the public opinion monitoring system to capture the negative comments on the Internet, the real estate enterprises with an average monthly complaint volume of  $>5$  items/project are included in the yellow warning. Second, dynamic grading management mechanism. Blue safety zone (score  $>85$ ): enjoy policy dividends such as green approval channel and priority registration for bond issuance. Yellow Observation Zone (70-85): Limit the eligibility of new land bidding, and require quarterly submission of debt restructuring programs. Orange Alert Zone (55-70): mandatory launch of pre-sale fund regulatory account audits and suspension of major asset disposal. Red High Risk Zone ( $<55$ ): take over the seal and license of the enterprise, and initiate bankruptcy reorganization or escrow operation procedures.

## 5. Conclusion

Shandong Province's real estate industry is undergoing a profound transformation, facing multiple challenges such as regional differentiation, land finance dependence, supply-demand mismatch and debt risk of real estate enterprises. The industry presents a pattern of coexisting stock optimization in the eastern coast and de-inventory pressure in the central and western parts of the country, with significant urban-rural disparities. Institutional barriers such as urban-rural dual land constraints and deficiencies in the fiscal and taxation system, as well as market-based conflicts such as the surplus of high-end residential units and the shortage of subsidized housing, have exacerbated the industry's imbalance. In terms of risky hidden dangers, the debt crisis of real estate enterprises has penetrated into the financial system, and the imbalance of house price-to-income ratio in key cities is prominent. In order to solve the problems, it is necessary to implement comprehensive measures from system innovation, policy optimization and risk prevention and control, and the above countermeasures are of great significance to the healthy and sustainable development of the real estate industry in Shandong Province and even in the whole country.

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