CHINA'S REAL ESTATE INDUSTRY:IS IT POSSIBLE TO REALIZE SOFT LANDING? —— A REVIEW AND EMPIRICAL ANALYSIS ON THE CREDIT RISK OF THE INDUSTRY

A Dissertation
Submitted to
the Temple University Graduate Board

In Partial Fulfillment
of the Requirements for the Degree
DOCTOR OF SCIENCE

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by
Yujie Liu
December 2022

Examining Committee Members:

Gurdip Bakshi, Advisory Chair, Department of Finance
Xiaohui Gao Bakshi, Department of Finance
Connie Mao, Department of Finance
Ram Mudambi, Department of Management

ABSTRACT

China’s real estate industry played an outsized role in both China and global economy and has experienced a rapid growth during the past 15 years, but it went through a tough period of roller-coaster since the last half of 2021.More and more concerns about the credit stability of the industry arise with the default rate going up dramatically and both of onshore and offshore public financing windows have almost closed. This paper aims to systematically review and analyze the historical growth and credit evolvement of Chinese real estate industry based on in-depth research on the relative literature and industry practice, and to explore the key factors that drive the significant changes of the industry. It is found that the historical high growth rate and low default rate of Chinese developers relied highly on government policies, credit easing and supply-demand structure of Chinese housing market. As the macroeconomic environment has changed tremendously since the year 2021, credit of Chinese developers deteriorated dramatically and the industry is entering into a cycle of deleveraging. The paper systematically analyzed the evolvement of the three key factors including public policy, supply-demand balance and financial stability of the key players, and draw a conclusion that it is really challenging for Chinese developers to achieve soft landing during this round of downturn because it is the result of the superposition and comprehensive fermentation of short-term, medium-term and long-term factors.

Key words: Chinese real estate, credit risk, soft landing, Default, policy, supply-demand, financial stability

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CHAPTER 1：INTRODUCTION

I spent most of my career working on real estate related investment, especially in the past eight years, and my investment included high yield public bonds trading, asset backed financing, project equity investment and etc. We really experienced a golden age if we looked back the evolvement of Chinese real estate industry in the past 15 years, which typically matches the ideal investment logic of "high yield with low risk".

Established in the mid-1980s and experienced rapid growth after the Granting of State-Owned Land Use Rights by China's Ministry of Land and Resources on August 31, 2004, the real estate market in China has fundamentally altered the way of how urban land and buildings are developed and allocate. With its impact on fixed asset formation and its demand for domestic as well as overseas raw materials and manufactured products, the China's real estate sector not only is important for China's economy but also influences the world economy. Recently, the Chinese housing market has received worldwide attention because of the expectation that a slump in the market there may result in a sharp slowdown of the China's economy, one of the largest powerhouse of the world economy.

China's real estate industry plays a tremendous role in China's economy, which contributed almost 6.8% of the total GDP of China in 2021[1], and the number will increase to around 20% if we also take into account those industries which are mainly driven by real estate. From the perspective of sales area, it increased by 27% year-on-year in the 1st half of the year 2021, but the situation changed dramatically since July 2021, it fell 15% year on year and also the sales price dropped significantly since August: he average sales price dropped down 13.8% from the beginning of 2022. The market continued to decline deeply when it came to 2022: from January to February, the sales of commercial housing fell by 19% year-on-year, the average sales price of

[1] Source: China State Statistics Bureau average

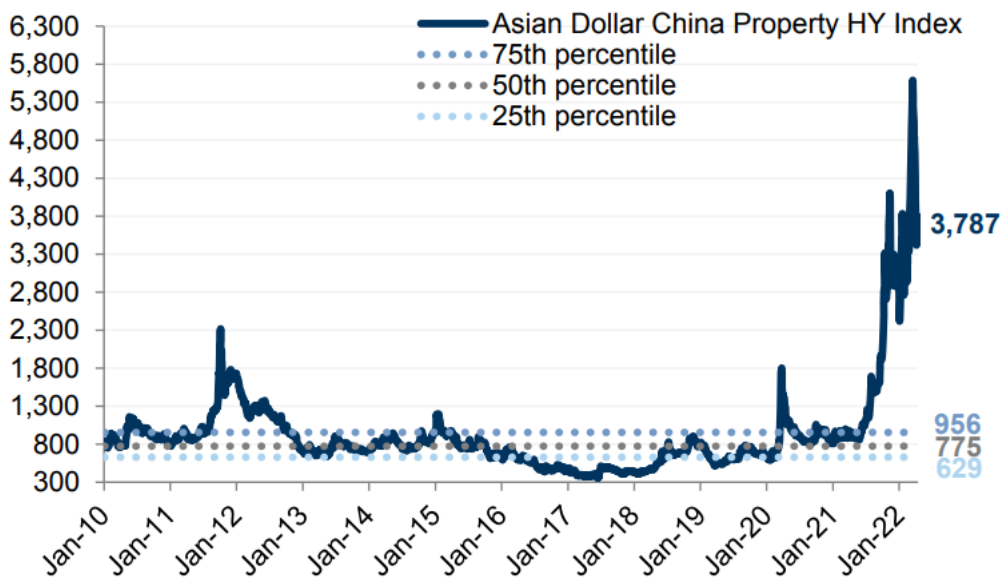
commercial housing fell by 11% year-on-year, and the sales of TOP 10 housing companies fell by 37% year-on-year[2]. From the perspective of financial statement of the major players in the industry, since the second half of 2021, they have ushered in an unprecedented round of rapid balance sheet reduction and clearing. The fundamental reason for the clearing is the unsustainable pattern of "high debt, high leverage, and high turnover". According to the annual report statistics, the average asset-liability ratio of domestic listed real estate companies is 79.2%, which is 27% higher than that of the manufacturing industry.

Also, companies in China's Real Estate Industry is the largest non-financial issuer in Asia of USD corporate bonds. Based on the JP Morgan JACI index as of the end of 2020, Chinese developers have 570 billion USD bonds outstanding, which counts for 10% of all USD bonds issued in Asia, and there are around 58 Chinese property developers with USD bonds outstanding that are listed in Hong Kong. By the end of 1st quarter of 2022, 40% of them were unable to release their FY21 audited reports; for issuers that have published FY21 results, in aggregate their unrestricted cash fell by 19% from the end of June 2021 to the end of December 2021.

Figure1 and Figure 2 show the historical performance of Chinese property HY Index and also the YTW of B-BB rating developers. The data demonstrate that the offshore funding cost of Chinese developers went up quickly since the 2rd half of 2021, which effectively proves the deterioration of the credit of Chinese property companies.

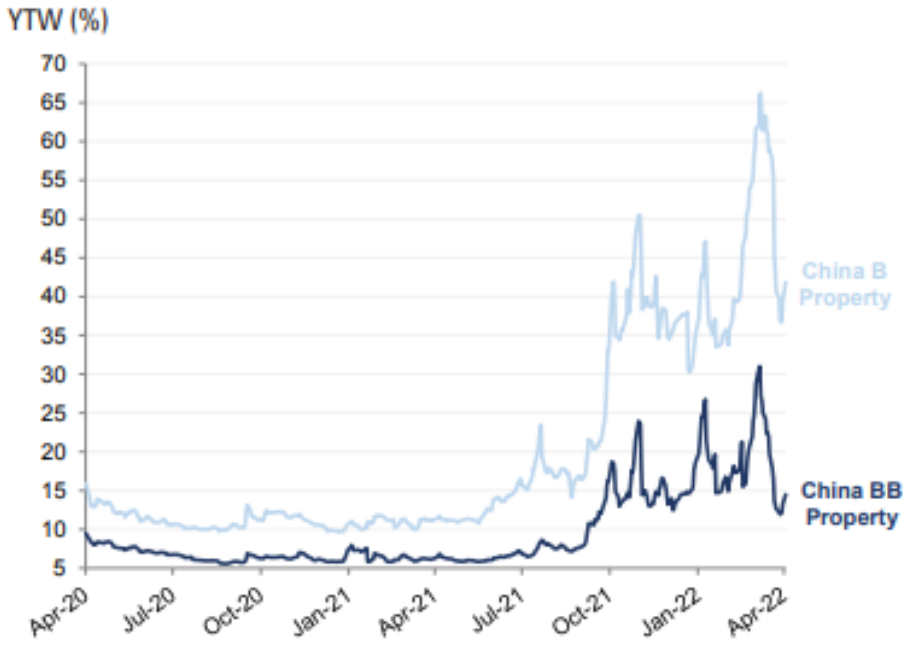
[2] Source: Chinese Real Estate White Paper by Poly Group

Figure 1 Chinese Property HY Performance from Jan 2010



Source: ICE-BAML, Goldman Sachs Global Investment Research

Figure 2 YTW for BB and B rated China Property



Source:ICE-BAML

Table below demonstrates the historical numbers of defaults/exchanges of Asia HY.It is obvious that the default rate of Asia HY went up dramatically from 2020 and reached the peak at 2021, also, the thesis found that 15 of the 23 default issuers in 2021 were property companies as the thesis analyzes the breakdown of the cases. Like most other emerging countries, China has low creditor protection and an inefficient legal system, which means the chances for bondholder recovery in the event of default is slim to none.

Table 1 Chinese Property HY Performance from Jan 2010

Year	No. of Defaults/ Bond exchanges	Notional amount (USD mn)
2008	2	270
2009	10	2,555
2010	3	885
2011	1	238
2012	5	2,905
2013	2	880
2014	4	1,483
2015	7	4,117
2016	2	1,173
2017	2	1,427
2018	8	6,086
2019	9	5,663
2020	18	12,480
2021	23	52,640
2022 YTD	20	9,711

Source: Bloomberg, Moody's, S&P, HKEX,

The major factors that drive the high growth of real estate industry in China during the past 20 years include the great gap of urbanization rate between China and developed countries, credit policy of central and local government, and also the supply-demand structure of China's housing market It did experience short-term fluctuation, but there were only few developers going bankruptcy or default in the capital market, and the credit of real estate developers in China kept steady for a relatively long term. But this time the situation looks different, this round of market downturn is the result of the superposition of short-term, medium-term and long-term factors, and comprehensive fermentation. The sharp tightening of credit in the third quarter of last year

demonstrated the firm determination of central government to control the bubble of the industry, and also by the end of 2021, the urbanization rate of Chinese permanent population was around 64.72%, which demonstrated a huge improvement from 10.64% in 1949 and 17.92% in 1978(NBSC) The shrinking buyer demand, dampened confidence and changing expectations led to the sharp decline of the first and second hand housing trading volume, which also functioned negatively to the credit evolution.

So it's unrealistic to expect that the releveraging of the sector is likely, why the credit of Chinese property companies deteriorated so quickly after more than 15 years' steady growth? What are the key factors that drive the credit crunch? And will the high default rate continue going forward? This article will systematically study historical research achievements based on literature review and also draw the conclusion based on the credit analysis of the industry.

The remainder of this paper is laid out as follows: Chapter 2 provides a literature review of real estate industry evolution and credit analysis, Chapter 3 described the research methodology and analysis based on the data selection and hypothesis, and possible conclusion and future work are presented in Section 4.

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CHAPTER 2：LITERATURE REVIEW

The relevant literature on the risks, bubbles and exuberance of the real estate market is in a period of rapid growth. Scholars in various fields have different research perspectives and diverse research methods, and a relatively unified research paradigm has not been formed (Shengguo Li, 2021).

Real estate financial risks can be divided into the following types: credit risk, liquidity risk, asset and liability risk, asset quality risk, exchange rate risk and other risks(Yemin Miao, 2019) Both international and domestic scholars have done a lot of research on the evolvement and assessment of credit risk of real estate industry. The vastness of the research that has been conducted can be illustrated by a search of Google Scholar for the term “real estate credit risk”, producing over 1,420,000 results. This chapter will narrow the discussion to the literature that includes Chinese real estate industry review, key drivers of credit risk and etc.

Compared with the United States, studies in China put more emphasizes on real estate policies. Domestic scholars began to study the real estate financial risk based on the land rent theory, and then the scholars studied the relationship among real estate and financial systems and macroeconomics from the macro and micro levels((Yemin Miao, 2019))，regarding the causes of real estate credit risk. He Xiaoxing and Zhao Hua believe that the underdeveloped land market, the excessive dependence of local governments on real estate, the large amount of credit investment by banks on real estate, and financial liberalization are the main causes of China’s real estate bubble(He, X.X. and Zhao, H.: 2006), and Yi Xianrong believes that China’s real estate is manipulated by the government and does not achieve complete market-oriented operation,. Real estate that does not achieve real market operation will certainly have a bubble(Yi, X.R.:2005). Based on the housing price data of 30 inter-provincial regions in China from 2000 to 2009, Wang

Liping used the extreme boundary method and analyzed the influencing factors of real estate price "stability", finding that local government is the main force pushing up housing prices and real estate sector to finance a significant number of initiatives and infrastructure projects. With the ultimate responsibility for generating local economic growth under fiscal constraints, many local governments depend on the budgetary and extra-budgetary revenues to make use of their administrative powers to shape the real estate market to maximize fiscal revenues. Also, lending from non-bank financial institutions to real estate development and investment by both authorized and unauthorised investment vehicles in real estate are abnormally large and carry excessive risks. Localised financial crises have occurred, leading to significant costs to investors, local and central governments(Wang, L.P.:2013). A study of house prices and monetary policy in eighteen major industrial countries showed that house price booms are typically preceded by a period of easing monetary policy (Xiaoqing Eleanor Xu, Tao Chen:2012).

Bibliometrics scholars have adopted quantitative methods to analyze the evolution trend in hotspots by combining the professional knowledge of the research field. There are many classical modeling methodology to evaluate and predict the credit risk, especially the default rate of corporate bonds. Models introduced by Merton(1974), Leland(1994), Anderson and Sundareson(1996), Mella Barral and Perraudin(1997) fit reasonably well, indicating that variations of leverage and asset volatility account for much of the time-series variation of observed corporate yields. The performance of the recently developed models which incorporate endogenous bankruptcy barriers is somewhat superior to the original Merton model(Ronald Anderson, Suresh Sundaresun, 2000). Later on, Merton Model was developed by KMV Corporation. Implied default probabilities from credit default swaps and corporate bond yield spreads are only weakly correlated with KMV-Merton default probabilities after adjusting for agency ratings, bond characteristics, and our alternative predictor(Sreedhar T Bharath and Tyler Shumway, 2004).

There are special credit risk characteristics in China's real estate industry; however, the classic KMV model is derived from historical data in the United States. Under this cirsumstance, the traditional KMV model is not applicable to China's real estate market. Xusheng Cheng, Ziran Sun and Weiqi Bao used the genetic algorithm KMV model to conduct an empirical analysis of the real estate listed companies in China from 2010 to 2019. The new GA-KMV model has larger coefficients on short-term debt (SD) and long-term debt (LD) than the original KMV model. Compared with the original KMV model, the overall accuracy of the GA-KMV model was improved by 2%(Xusheng Cheng ,Ziran Sun and Weiqi Bao:2020). Yan Chen and Guanglei Chu made further research on China's real estate default risk with KMW model and time-varying copula. They found that the large company usually had a higher asset-to-liability ratio in the real estate industry, which means a higher risk in the financial view. This high ratio makes the large company's default distance more than the small size company. This result is contrary to our common understanding. These real estate companies in China with large size usually have higher asset liability ratio, which brings them a higher default risk(Yan Chen and Guanglei Chu, 2014). Yuan-Xiang Dong, Zhi Xiao, and Xue Xiao described an empirical experiment that used a sample of 14 default and 315 non-default listed real estate companies in China and reported that most results using single prediction models with a balanced dataset generated better results than an imbalanced dataset(Yuan-Xiang Dong, Zhi Xiao, and Xue Xiao:2014).

The conventional analysis has not developed a computational method to forecast, directly from a company's financial statements, the default probability, the recovery rate, and ultimately the fundamental valuation of a company's credit risk in terms of credit spreads to risk-free rate. Jack Xu introduced one approach that incorporates a company's multiple dimensional financial state, as embodied by the balance sheet, into a dynamical model. The approach enables fundamental credit analysis to algorithmically forecast default and valuate debt based only on a

company’s financial statements and macro boundary conditions. The approach is particularly useful in evaluating the risk of multiple companies with its ability to forecast joint default based on operational correlation and shared macro boundary conditions(Xu, Jack, 2022).

In spite of the vast research on failure prediction, the original Z-Score Model introduced by Altman (1968) has been the dominant model applied all over the world(Edward I. Altman:2014). Xin-Ning LIANG has constructed a database of 45 listed real estate companies, which are supposed to represent the whole real estate industry in China. Particularly in 2015, the vast majorities (78%) of listed companies were grouped into the gray area, indicating the potential distress of these companies, and only 6 companies were classified as financial healthy ones. The results are in line with the viewpoints of international credit rating agencies who have lowered outlook on credit conditions in China's real estate development sector. Further analysis shows that profitability decline is the key factor raising the risk of a financial distress(Xin-Ning LIANG:2017).

As COVID-19 spreads globally since 2019, the construction investment has been affected due to the life and work style changes across many major countries. Arturas Kaklauskas and other authors made the research on the side effect of the COVID-19, and they found that the current pandemic would bring with it the irreversible effect, creating a different perception and attitude towards accommodation and commercial property in financial, socio-economic, and environmental terms. (Arturas Kaklauskas, Edmundas Kazimieras Zavadskas, Natalija Lepkova 1, Saulius Raslanas 1 Kestutis Dauksys 1, Ingrida Vetloviene 2 and Ieva Ubarte:2021). Moreover, Xiaoling Chu showed that firm size has a significant bearing on moderating the impact of COVID-19 but only when these larger firms also adopt a geographically diversified corporate strategy(Xiaoling Chu, Chiuling Lu, Desmond Tsang:2021).

CHAPTER 3：RESEARCH METHODOLOGY AND ANALYSIS

The paper will systematically review the development of real estate industry in China, and then analyze the key factors that affect the credit performance of the industry. Literature review lists several methodologies which can be adopted to analyze the development of global real estate industry, and also introduces a lot of classical models to predict the credit risk of the industry and developers. However, real estate industry in China has its own characteristics when compared with US and European markets. Especially, the public policies play a very important role in the evolvement of the industry. Therefore, it is found find that Chinese scholars prefer to use more analytical skills compared with western scholars who rely more on numerical results. Both approaches have their value for the research of real estate industry in China. As a result, the paper will combine them together to have a more comprehensive analysis on the real estate industry in China.

As mentioned in the previous chapter, the research will focus on the major factors that determine the healthy development and credit performance of the industry and developers, including macro-economic policies, supply-demand balance of the housing market and financial risk analysis of the key players in the market.

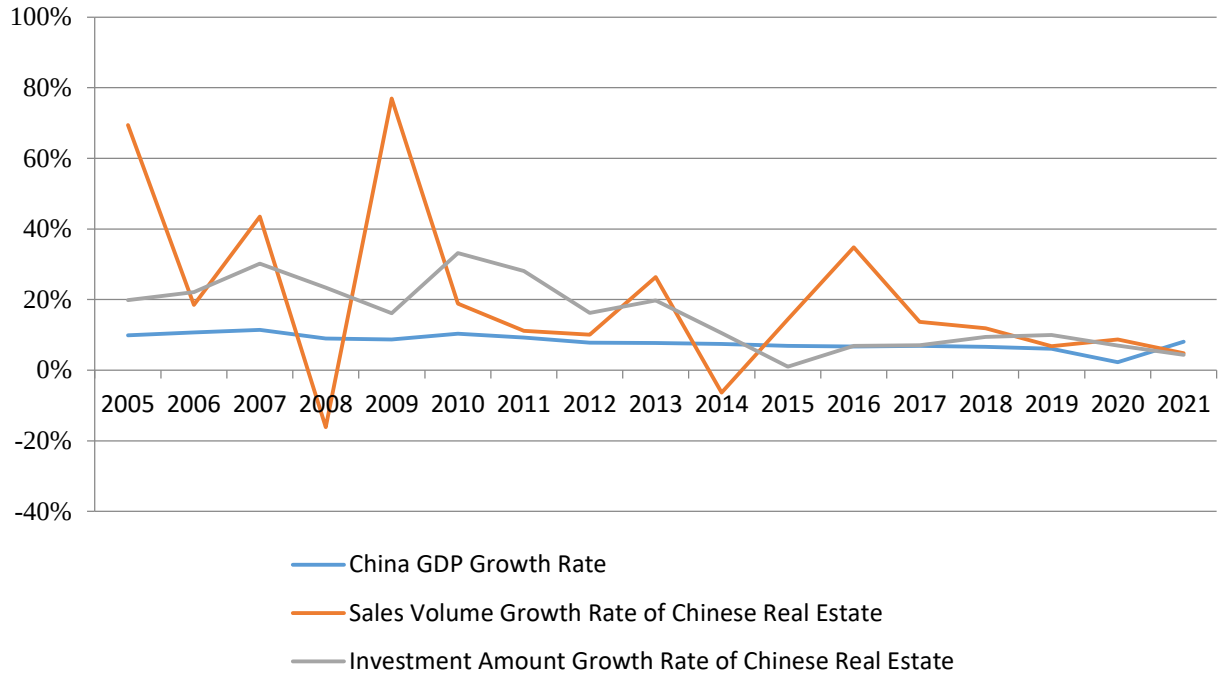
1. Industry Review

China's GDP has experienced rapid growth since the country's reform and opening-up in 1978, which led to the commercialization of real estate industry effectively. The development process of the industry can be generally divided into three stages: from 1978 to 1998, government in China controlled the distribution of properties, and the real estate market itself only played a secondary role. In July of 1998, real estate became commercialized through reform policies. Local governments have established programs to sell properties to people instead of providing them with

housing as part of employment benefits. In August 2004, China's Ministry of Land and Resources issued the new policy of granting State-Owned Land Use Rights to buyers for a maximum of 70 years, and the land policy change further accelerated the development of commercial property market. Based on the development characteristics and policy evolvement of the industry, the paper mainly uses the historical data from 2005-2021, which can effectively outlines the growing path and the key turning points of the industry.

It is found that the growth rate of the sales volume of real estate industry kept higher than the GDP growth rate during most of the years since 2005 except 2008, 2014 and 2021. The decline in 2008 was mainly driven by the global financial crisis following the credit collapse of Fannie Mae and Freddie Mac of the U.S.. Chinese property prices and sales were affected dramatically by the global crisis and Chinese government introduced a four trillion yuan fiscal stimulus plan to cope with the challenge. Of the 4 trillion RMB, 2.7 trillion RMB was poured into nationwide real estate development. The stimulus caused positive effect to the economy and we can find a rapid rebound in 2009. And then the housing market experienced five years fast growth and showed a state of overheating, as inventory volume of large developers went to record high level and supply greatly exceeded demands. So the market began to destocking and the housing price went downward. Under such circumstances central government responded quickly and issued a series of easing policies to stimulate the market. For example, central government issued "Classified regulation" to give local governments more autonomy. Targeted RRR and other means of "micro stimulation" attempted to ensure the credit demand of self-occupied house purchase and etc.. The policy package took effect and the market recovered from 2015 and kept steady growth until the 2rd half of 2021.

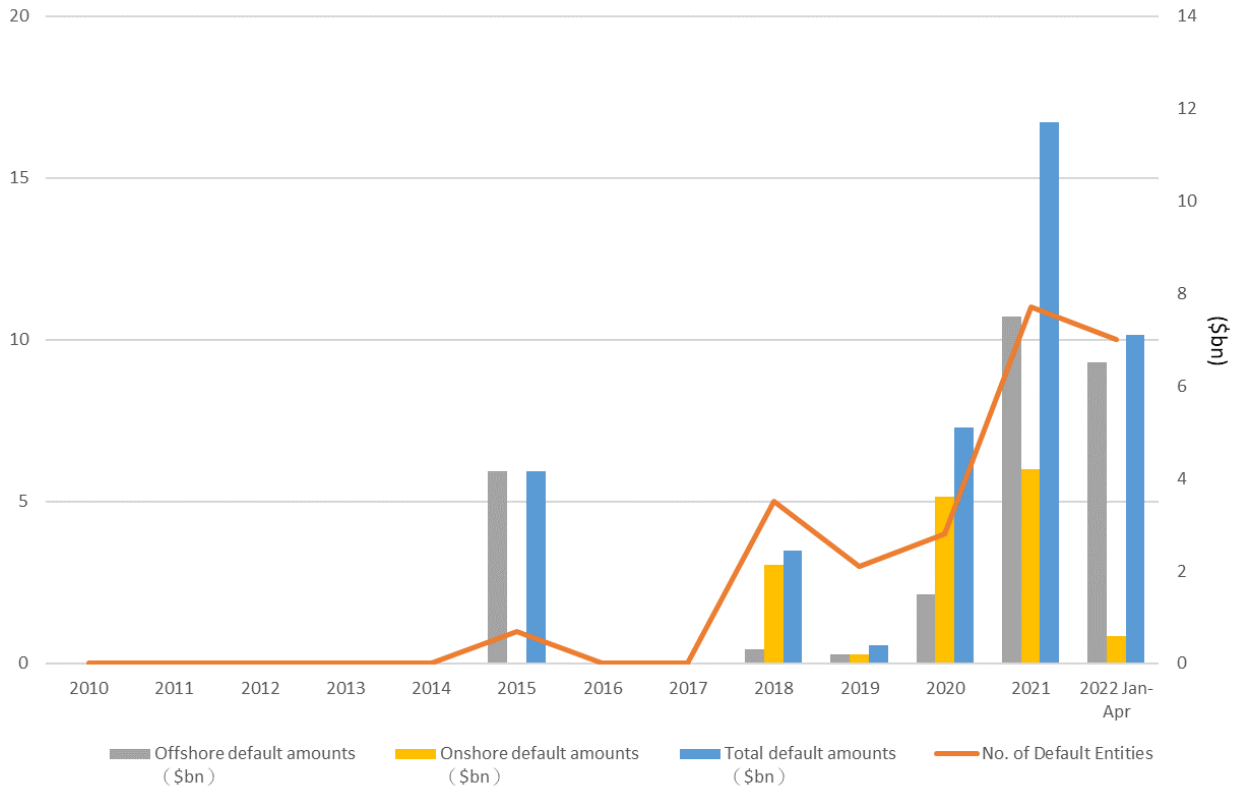
Figure 3 Sales volume & Investment amounts growth rate of Chinese real estate



Source: National Bureau of Statistics of China

Actually the credit of Chinese developers began to deteriorate since 2020, it is found from the statistics that very few large-scale developers went default from 2010-2019 except Kaisa who publicly defaulted in 2015 because of its chairman's involvement in political corruption. Nevertheless, the default volume and numbers of default entities increased dramatically since 2020 and it came to the peak at the 2nd half of 2021.

Figure 4 Default statistics of Chinese developers



Source: DMI Statistics

2. Policy Analysis

Government in China has implemented a series of policies since 2003 to pose restrictions on the real estate market. These measures are taken in attempts to stabilize the real estate market. Most of the implementation of these policies will be at the local government level, who will shoulder the responsibility to guarantee low-income housing is properly constructed to meet the basic needs of the residents. Macro regulation of Chinese government can be divided into four stages: Stricken Management Stage (2003-2004): when the main policy was to use land supply plans, land transfer methods and land regulatory policies to regulate the real estate market; Regulation stage (2004-2007): during this period, China regulated land transfer, and clearly stipulated the use of land, and began to use land tax and land financial policies to participate in real estate regulation. Responding to the international financial crisis (2008-2009) : In 2008-2009,

in response to the international financial crisis, government in China adopted more monetary policies, supplemented by fiscal policy, but used less land policy, and most of it them were the same as the policy in the previous period. Perfect system and supervision stage (2010-present): The land policies applied since 2010 mainly include land supply policies and land supervision policies. The first is to vigorously tilt the land supply structure to affordable housing; the second is to improve the 'bidding, auction, and listing' system for land transfer; and the third is to strengthen the land use supervision of the real estate market.

(1) Land policy

With regard to the policy effect on the development of China's real estate industry, we have to understand the background that government in China retains far more control over future prices and construction. And also, most importantly and dramatically, all land in China is owned by the state, and the central government decides which land can be auctioned to private developers. Article 70 of the Chinese Property Rights Law of 2007 does grant the right to own the structures on the land but not the land itself. Article 149 suggests that use rights will be automatically renewed. So far, China's government has not charged additional fees for the relatively unconstrained rights to use the land after the first land sale, but it is unclear what compensation local governments will require for use right renewals in the future.

(2) Monetary & credit policy

As the central monetary policy maker, People's Bank of China has a tools box to adjust the fluctuation of real estate market and also accumulated ample experience of macro-regulation

in the past 20 years. The most frequently used monetary policies include: adjustment of People's Bank of China's required reserve deposit ratio, guidance on mortgage interest rates, mortgage loan, and requirement of the equity down payments shares.

(3) Industry regulation measures

As mentioned above, government in China has granted most of the industry regulation responsibilities to local authorities. Local governments can adopt different kinds of measures to regulate the market including: restriction on purchase and sale, controlling on land supply and etc. The most influential policy is that central government carried out "three red lines" regulation on the financial restriction of domestic developers in 2021. The regulations requires a liability-to-asset ratio excluding advance receipts for developers of less than 70 percent, a net debt-to-equity ratio of less than 100 percent and a greater than one ratio of cash to short-term debt ratio. Another key policy that affects the cash flow of developers is that local government tightened the monitoring on the pre-sale capital of single project in order to make sure the successful completion of the project in case the developer goes default.

Besides, central government is considering the introduction of local properties tax. The house property tax is very important as well to China 's real estate industry. First, house property tax will shorten the gap between the rich and the poor in society. Secondly, it will have an impact on developers. With the real estate tax, the buyer will pay an extra amount of related expenses.

The "14th Five-Year Plan" mentioned that residential properties should adhere to residential positioning, refrain from speculation, and local government could implement policies based on the city's situation to promote the stable and healthy development of the real estate market. Under the current environment where the overall economy has undergone structural

deleveraging, the government has less policy ammunition to manipulate credit and liquidity and less capital resource to roll out massive fiscal investment.

Table 2 Policy prediction of Chinese housing market

	Policy	**Category**	**Policy outlook**
1	Adjustment of reserve ratio	Monetary policy	Start to loosening
2	Interests rate	Monetary policy	Lowing down
3	Mortgage loan	Credit policy	Loosening
4	Developing loan	Credit policy	Loosening, but mainly for state-owned developers
5	Loan for acquisition of land and construction in progress	Credit policy	Loosening and encouraging
6	Requirement of equity down payments	Credit policy	No change, but high probability to be lowered down
7	Three red lines	Industry regulation	No change
8	Restriction on new houses / secondary houses purchase	Industry regulation	Loosening
9	Restriction on the new houses sales	Industry regulation	Loosening
10	Monitoring on pre-sale capital	Industry regulation	Tightening
11	Tax policy. adjustment of the	Fiscal policy	Loosening

	transaction tax and income tax for properties		
12	Social housing support	Industry regulation	Loosening and encouraging

The key industry policies, especially the presale policy has been implemented for a relatively long time. A unique character of the real estate development in China versus that in other countries is the presale of uncompleted development projects at full value to buyers. Generally speaking, a residential project takes two years to complete while a developer normally presells the project units one year after land purchase. The developers can use the presale proceeds as new capital for land acquisition as bank loans are generally forbidden in China for such purpose.

As described, most of the policies are getting friendly to developers and house buyers due to the quick downturn of the industry and also the huge pressure that China's economy is facing. By interviewing with many entrepreneurs, analysts and fund managers and also doing a lot of research on the detailed functioning of all these policies. "Three red lines" and "strictly monitoring on the pre-sale capital" play a determinant role in this round of credit crash down In order to stimulate the market back to the track, central and local government is beginning to loosen monetary and regulatory policies such as lowering down interests rate, encouraging banks to provide mortgage loan to house buyers, cancelling the purchase restrictions and etc. But we didn't see any clear signals for the turnround of the financing environment for private developers and also local governments' monitoring on pre-sale capital means it is still very difficult for private giant developers to get incremental cash flow. Also, considering central governments' insistence

on the deleveraging of real estate industry and local governments' emphasis on the successful completion of developing projects to ensure the social stability, real estate developers in China will continue facing great challenges from a public policy point of view.

3. Supply-demand Analysis

(1) Parameters selection and data preparation

This paper will analyze the key parameters that affects supply-demand relationship of housing market. Table below is a list of the factors that have potential correlation with residential sales volume, and the paper will select some of the parameters with official or public historical data for the regression analysis.

Table 3 Key parameters that affect supply-demand of housing market

Demographics	**Economics**	**Other factors**
1.Population 2.New born 3.Marriage registration 4.Urbanisation rate 5. GDP growth rate 6.Contribution to GDP	1.CPI 2.M2 3.Growth rate of disposable income 4. Fixed asset investment	1.Residential investment 2.Residential under construction 3.Urban per capita housing area 4.Growth rate of average land price 5.Growth rate of average housing price

Most of the raw historical data were extracted directly from yearbooks from 2005 to 2021, which are available in the China State Statistics Bureau. For some of the data that could not be extracted from yearbooks, they were collected by searching through Internet or related industry research report. The paper will mainly adopt the growth rate of different variables because the size of them are dramatically different and not comparable.

(2) Correlation test

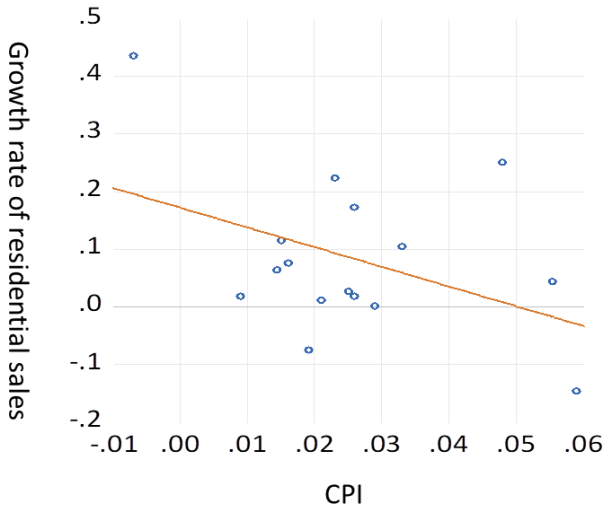
In order to find the factors that have more correlation with the residential sales, the paper uses EVIEWS scatter graph to process the correlation test. In terms of the variable selection, the test uses growth rate of residential sales as dependent variable because the residential sales is a remarkable factor to analyze Chinese housing demands, and the other 15 parameters as independent variables. Below is the raw data of the key parameters from 2006-2021 for the test.

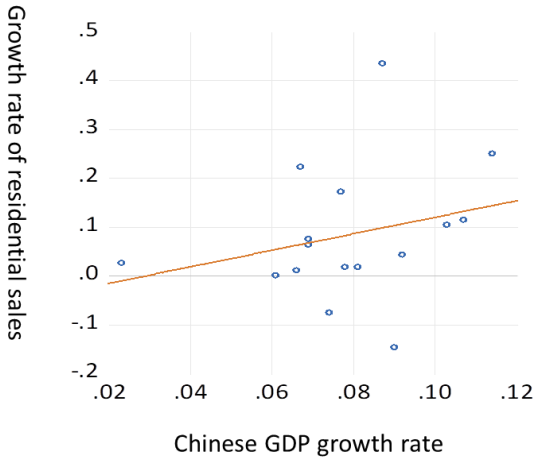
Table 4 Raw data of the key factors for regression test

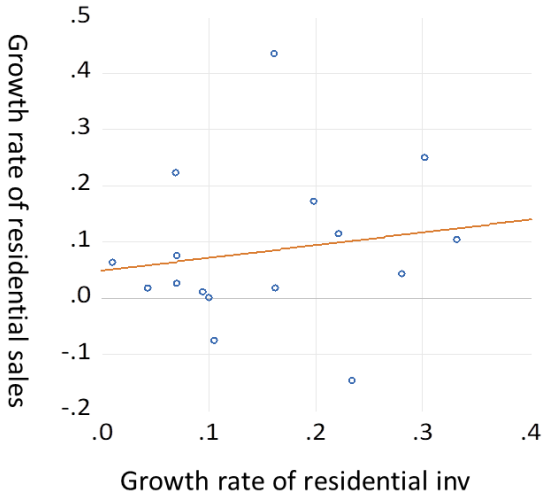
Year	Growth rate of residents sales	CPI	GDP growth rate	Growth rate of residents inv	residents under construction	Growth rate of fixed assets inv	Population growth rate	New born growth rate	Marriage rate	M2 growth rate	growth rate of disposable income	Urbanisation rate	Urban per capita housing area	Contribution to GDP	Growth rate of average land price	Growth rate of average housing price
	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15
2006	11.48%	1.50%	10.70%	22.09%	17.30%	23.90%	0.53%	3.19%	0.72%	16.90%	10.40%	43.90%	28.5	4.70%	23.42%	6.00%
2007	25.05%	4.80%	11.40%	30.20%	21.32%	24.80%	0.52%	0.06%	0.75%	16.70%	12.20%	44.90%	30.1	5.10%	13.41%	165.82%
2008	-14.72%	5.90%	9.00%	23.39%	19.87%	25.50%	0.51%	2.26%	0.83%	17.80%	8.40%	45.68%	30.6	4.60%	41.29%	0.22%
2009	43.63%	-0.70%	8.70%	16.15%	13.10%	30.10%	0.49%	0.06%	0.91%	27.70%	9.80%	46.60%	31.3	5.40%	7.24%	9.92%
2010	10.56%	3.30%	10.30%	33.16%	26.53%	23.80%	0.48%	0.00%	0.93%	19.70%	7.80%	49.95%	31.6	5.70%	8.63%	11.01%
2011	4.39%	5.55%	9.20%	28.05%	25.02%	23.60%	0.62%	0.76%	0.97%	13.60%	10.30%	51.27%	32.65	5.70%	5.79%	6.43%
2012	1.77%	2.60%	7.80%	16.19%	13.15%	20.30%	0.75%	2.19%	0.98%	13.80%	10.60%	52.57%	32.91	5.70%	2.62%	2.26%
2013	17.29%	2.60%	7.70%	19.79%	16.07%	19.30%	0.11%	0.31%	0.99%	13.60%	8.10%	53.73%	NA	6.00%	7.03%	8.94%
2014	-7.58%	1.92%	7.40%	10.49%	9.15%	15.30%	0.52%	2.87%	0.96%	12.20%	8.00%	54.77%	NA	5.90%	5.17%	4.85%
2015	6.50%	1.44%	6.90%	1.00%	1.27%	9.80%	0.50%	-1.90%	0.90%	13.30%	7.40%	56.10%	35.81	6.20%	3.15%	3.92%
2016	22.46%	2.30%	6.70%	6.88%	3.16%	7.90%	0.59%	7.92%	0.83%	11.30%	6.30%	57.40%	36.6	6.50%	5.31%	7.91%
2017	7.66%	1.60%	6.90%	7.04%	2.97%	7.00%	0.53%	-3.53%	0.77%	8.20%	7.30%	58.52%	36.9	6.60%	6.72%	10.21%
2018	1.21%	2.10%	6.60%	9.44%	5.22%	5.90%	0.38%	-11.61%	0.73%	8.10%	6.50%	59.58%	39	6.65%	6.17%	8.56%
2019	0.05%	2.90%	6.10%	10.01%	8.70%	5.10%	0.33%	-3.81%	0.66%	8.70%	5.80%	60.60%	39.8	7.10%	3.77%	4.97%
2020	2.64%	2.50%	2.30%	7.00%	3.69%	2.70%	0.86%	-18.09%	0.58%	10.10%	2.10%	63.89%	NA	7.34%	1.75%	3.11%
2021	1.90%	0.90%	8.10%	4.35%	5.25%	4.90%	0.03%	-11.50%	0.58%	9.00%	8.10%	64.72%	NA	6.78%	2.55%	3.49%

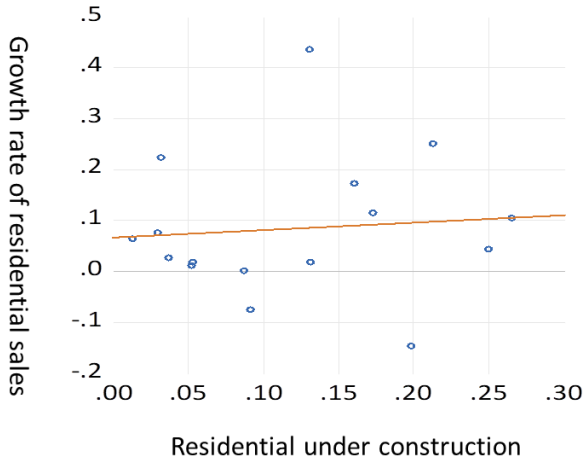
Below is the results of the scatter test processed by EVIEWS, which reveals the correlation relationship between each factor and the growth rate of residential sales. Factors with high statistical significance against the housing demands can be identified.

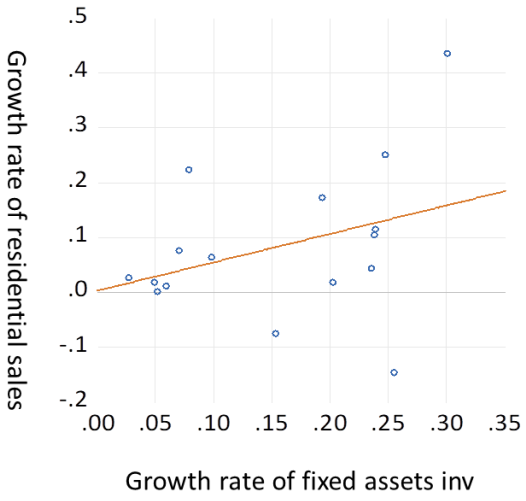
Figure 5 Scatter charts of the correlation between residential sales and key factors

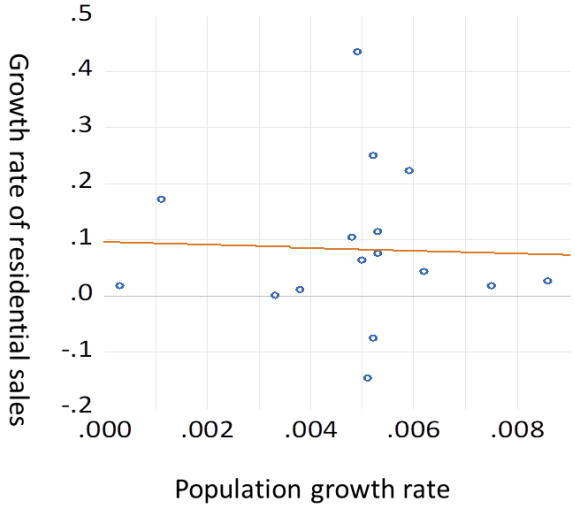


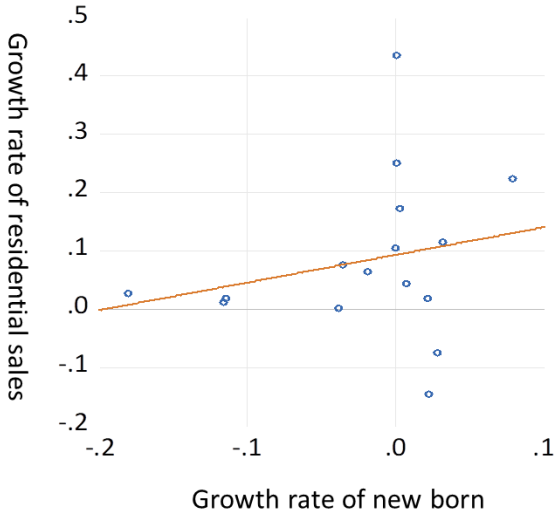


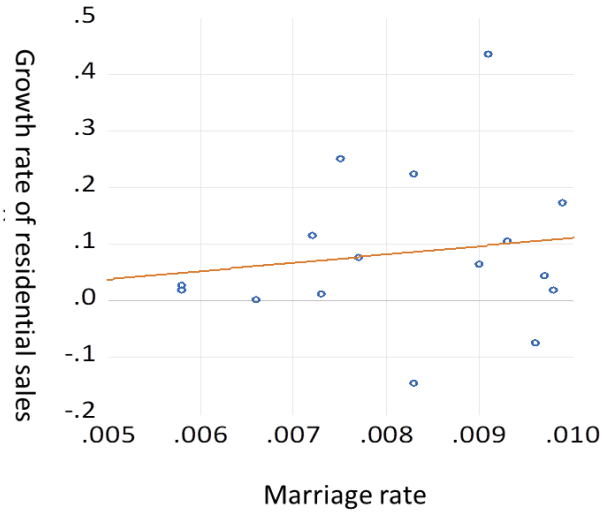


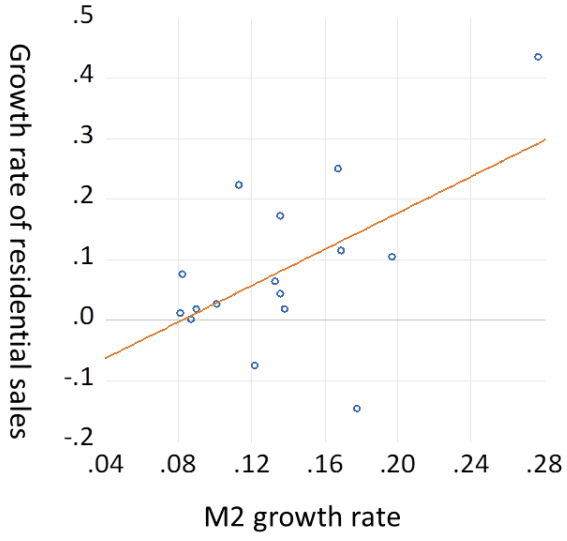


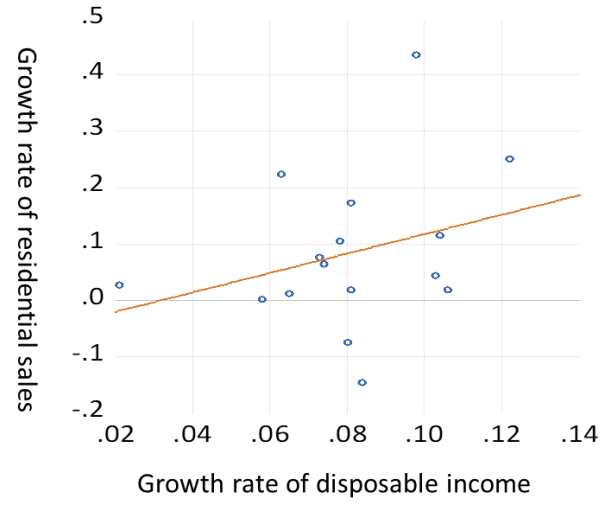

Growth rate of residential sales
.5
.4
.3
.2
.1
.0
-.1
-.2
.00
.05
.10
.15
.20
.25
.30
.35
Growth rate of fixed assets inv

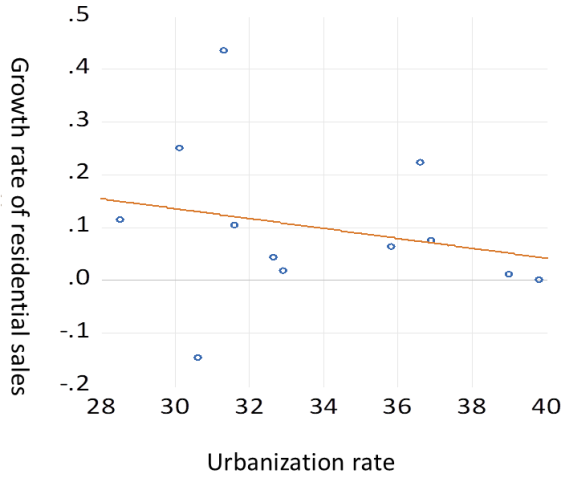

Growth rate of residential sales
.5
.4
.3
.2
.1
.0
-.1
-.2
.000
.002
.004
.006
.008
Population growth rate

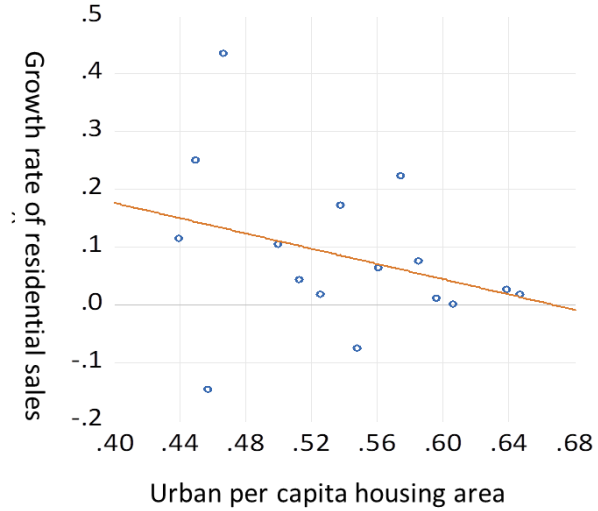

Growth rate of residential sales
.5
.4
.3
.2
.1
.0
-.1
-.2
-.2
-.1
.0
.1
Growth rate of new born

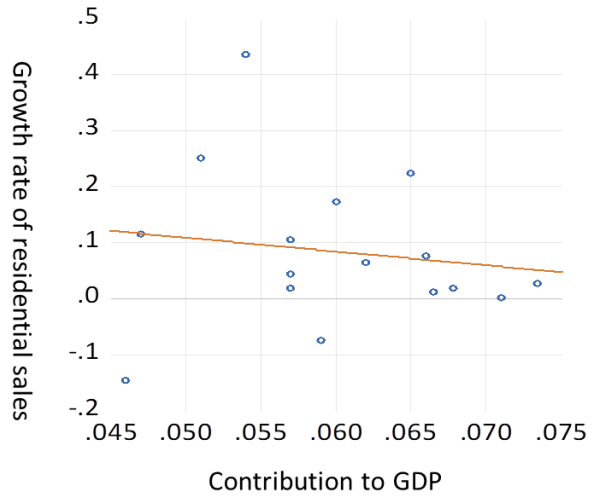

Growth rate of residential sales
.5
.4
.3
.2
.1
.0
-.1
-.2
.005
.006
.007
.008
.009
.010
Marriage rate


Growth rate of residential sales
.5
.4
.3
.2
.1
.0
-.1
-.2
.04
.08
.12
.16
.20
.24
.28
M2 growth rate


Growth rate of residential sales
.5
.4
.3
.2
.1
.0
-.1
-.2
.02
.04
.06
.08
.10
.12
.14
Growth rate of disposable income


Growth rate of residential sales
.5
.4
.3
.2
.1
.0
-.1
-.2
28
30
32
34
36
38
40
Urbanization rate


Growth rate of residential sales
.5
.4
.3
.2
.1
.0
-.1
-.2
.40
.44
.48
.52
.56
.60
.64
.68
Urban per capita housing area


Growth rate of residential sales
.5
.4
.3
.2
.1
.0
-.1
-.2
.045
.050
.055
.060
.065
.070
.075
Contribution to GDP


Growth rate of residential sales
.5
.4
.3
.2
.1
.0
-.1
-.2
.0
.1
.2
.3
.4
.5
Growth rate of average land price

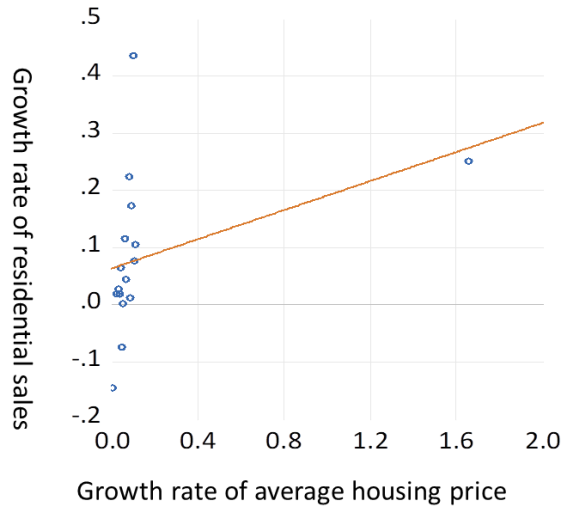

Growth rate of residential sales
.5
.4
.3
.2
.1
.0
-.1
-.2
0.0
0.4
0.8
1.2
1.6
2.0
Growth rate of average housing price

Table 5 Statistical significance of key factors with residential sales

	Factors	**Corre Value**	**T Statistics**	**P value**
1	CPI	-0.56	-2.14	0.05
2	GDP growth rate	0.25	0.80	0.44
3	Growth rate of residents inv	0.04	0.12	0.91
4	residents under construction	-0.03	-0.09	0.93
5	Growth rate of fixed assets inv	0.30	0.98	0.35
6	Population growth rate	0.05	0.15	0.89
7	New born growth rate	0.24	0.77	0.46
8	Marriage rate	0.11	0.33	0.74
9	M2 growth rate	0.55	2.08	0.06
10	growth rate of disposable income	0.30	1.00	0.34
11	Urbanization rate	-0.26	-0.86	0.41
12	Housing area per capita	-0.23	-0.76	0.46
13	Contribution to GDP	-0.07	-0.23	0.82
14	Growth rate of average land price	-0.35	-1.19	0.26
15	Growth rate of average housing price	0.36	1.23	0.25

The statistical significance analysis between growth rate of residential sales and other parameters was processed by EVIEWS. Through this exercise, the factors with T statistics below

2 and P value above 0.05 can be rejected, and CPI and M2 growth rate can be accepted as P value is very near to 0.05.

And then the paper ran a multi variate regression based on Least Squares Method to better understand the relationship between residential sales and the selected variables Below is the corresponding result, the result shows that P value of the regression is around 0.02, which is acceptable for the correlation test.

Dependent Variable: Y
Method: Least Squares
Date: 07/31/22 Time: 22:39
Sample: 2006 2021
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.033747	0.092998	-0.362877	0.7225
X1	-3.137568	1.658511	-1.891798	0.0810
X9	1.438987	0.546258	2.634261	0.0206

R-squared	0.462679	Mean dependent var	0.083931
Adjusted R-squared	0.380014	S.D. dependent var	0.138086
S.E. of regression	0.108728	Akaike info criterion	-1.432573
Sum squared resid	0.153683	Schwarz criterion	-1.287712
Log likelihood	14.46058	Hannan-Quinn criter.	-1.425155
F-statistic	5.597056	Durbin-Watson stat	2.960207
Prob(F-statistic)	0.017641		

Among all the factors listed above, CPI, growth rate of M2 are most correlated to residential sales, especially growth rate of M2. Chinese central government issued a new round of economic stimulus plan in May 2022, and the total stimulus package includes tax return, financing guarantee, special debt support, SME lending support and etc. Just like the stimulus plan in 2008, M2 volume increased rapidly from 2009 after RMB 4tn stimulus plan came out in 2008, growth rate of M2 achieved 27.7% in 2009, which also drove the recovery of the housing market. As expected, this round of stimulus will have positive effect on the growth of M2, but

there is a clear signal that central and local governments will be very cautious to let the new capital flow into real estate industry, and so, the effects of M2 will be very limited due to the policy restriction.

In conclusion, the housing market really experienced rapid growth in the past 20 years, but the supply-demand relationship is changing. All the major factors that affect the supply- demand of the housing market will have limited positive effects to the recovery of the market, it is doubtful to predict that the residential sales can go up dramatically in the near future.

4. Financing Analysis

Financial analysis is the fundamental tool to judge the credit risk of any industry or company, also, financial liberalization is one of the main causes of China's real estate bubble. Scholars have done a lot of research to analyze the health of Chinese developers' financials, because real estate industry in China has relatively higher leverage than other industries. The criterion of default in structural models – that the total asset value falls below the fixed debt level is not applicable in the prediction of Chinese real estate companies. The cause of developers' default is that they have negative cash, not negative equity. Default occurs simply when a company runs out of cash, but cash is the most unpredictable financial variable of a company because it interacts with every other financial variable involved in a company's operation and financing.

(1) *Research methodology*

Based on the literature review regarding the classical credit analysis models proposed by

different scholars and also the particularity of Chinese real estate industry, the classic KMV model is derived from historical data in the United States. Therefore, the traditional KMV model is not applicable to China's real estate market. This paper plans to adopt the classical Z-score model and also the public financial data of HK and A-share listed companies to carry out credit analysis on the major developers.

With regard to Z-score model, Altman and his colleagues developed a particular model called $Z_{\text{-China}}$ score model to support identification of potential distress firms in China. After considering a large number of combinations of the 15 characteristic variables, the final model to capture the distress risk of Chinese companies included just four variables, including asset liability, working capital, return on total assets, and retained earnings ratios. The formula is as follows:

Z-China = 0.517-0.460X1 + 9.320X2 + 0.388X3 + 1.158X4.

where

X1 =asset liability ratio (total liabilities/total assets);

X2=rate of return on total assets (net profit/average total assets);

X3 =working capital to total asset ratio (working capital/total assets);

X4 =retained earnings to total assets ratio (retained earnings/total assets).

Regarding the cutoff score, firms with $Z_{\text{-China}}$ score less than 0.5 ($Z<0.5$, dangerous area) are classified as financially distressed companies, firms with $Z_{\text{-China}}$ score over 0.5 and less than 0.9 ($0.5 <Z<0.9$, grey area) are classified as potential distress ones, and firms with Z-China score over 0.9 ($Z > 0.9$, healthy area) are classified as financially healthy ones.

(2) ***Data collection and assumption***

Considering representativeness of the whole Chinese real estate industry and data availability, the paper mainly collected the data from listed companies with real estate as core business, and also the sales volume of the company should be ranked top 100 in China Most of the data were extracted from annual report of the listed company or other disclosing materials from the exchange.

So the data collection and analysis is based on the following assumptions: Sample dataset of HK and A share listed real estate companies can approximately demonstrate the credit of China's real estate industry. HK and A-share listed developers account for a large proportion of China's real estate sales volume. And HK listed developers play a dominant role in the offshore public bonds financing market, so the representativeness of the sample portfolio is acceptable for the credit research of the industry. With regards to the availability of the financial data, HK Exchange has strict requirements on the disclosure of financial statements and other related information. As we all know, there are out of balance sheet financing among most of the China's real estate developers, especially the shadow loan which was lent by non-banking institutions, but it's really difficult to calculate the amounts precisely. So the thesis have to rely on the official disclosure for the modeling.

Based on the above criteria, 44 companies were selected to form the sample portfolio. Due to the strict restriction on the real estate companies to get listed on A-share market, most of the top 100 developers chose to be listed on HK exchange, and the thesis mainly adopted the financial data from 2016-2021 of portfolio companies for easy reference.

Table 6 List of selected HK and A share listed companies

	Ticker	Company name		Ticker	Company name
1	2202.hk	CHINA VANKE-H	24	6158.hk	ZHENRO PROPERTIE
2	3333.hk	CHINA EVERGRAND	25	2772.hk	ZHONGLIANG
3	960.hk	LONGFOR GROUP	26	3900.hk	GREENTOWN CHINA
4	2007.hk	COUNTRY GARDEN	27	1638.hk	KAISA GROUP
5	600048.sh	POLY DEVELOPME-A	28	1238.hk	POWERLONG
6	1918.hk	SUNAC	29	1628.hk	YUZHOU GROUP
7	001979.sz	CHINA MERCHANT-A	30	600466.sh	SICHUAN LANGUA-A
8	3380.hk	LOGAN GROUP	31	600823.sh	SHANG SHIMAO-A
9	600606.sh	GREENLAND HOLD-A	32	1966.hk	CHINA SCE GROUP
10	600340.sh	CHINA FORTUNE-A	33	2103.hk	SINIC HOLDINGS-H
11	600383.sh	GEMDALE CORP-A	34	3377.hk	SINO-OCEAN GROUP

12	884.hk	CIFI HOLDINGS GR	35	600325.sh	ZHUHAI HUAFA-A
13	000069.sz	SHENZEN OVERSE-A	36	3301.hk	RONSHINE CHINA H
14	1030.hk	SEAZEN GROUP	37	000732.sz	TAHOE GROUP
15	000656.sz	JINKE PROPERTI-A	38	1622.hk	REDCO PROPERTIES
16	1813.hk	KWG GROUP	39	832.hk	CENTRAL CHINA
17	3383.hk	AGILE GROUP	40	1777.hk	FANTASIA HOLDING
18	002146.sz	RISESUN REAL -A	41	2608.hk	SUNSHINE 100 CHI
19	2777.hk	GUANGZHOU R&F -H	42	1107.hk	MODERN LAND
20	1233.hk	TIMES CHINA HOLD	43	1862.hk	JINGRUI HOLDINGS
21	000671.sz	YANGO GROUP CO-A	44	817.hk	CHINA JINMAO
22	3883.hk	CHINA AOYUAN	45		
23	600208	XINHU ZHONGBAO-A			

(3) *$Z_{\text{-China}}$ score simulation results*

Based on the formula of $Z\text{-}_{\text{China}}$ score model and the raw financial data of sample portfolio, results of Z-China scores from 2016-2021 and also the average number of the sample companies were calculated and presented in Table 7. It is found that the $Z\text{-}_{\text{China}}$ scores get much smaller during the last six years, which means the credit risk of the industry gets higher, and there should be more default cases in the industry.

Table 7 $Z_{\_\text{China}}$ scores statistics of sample portfolio

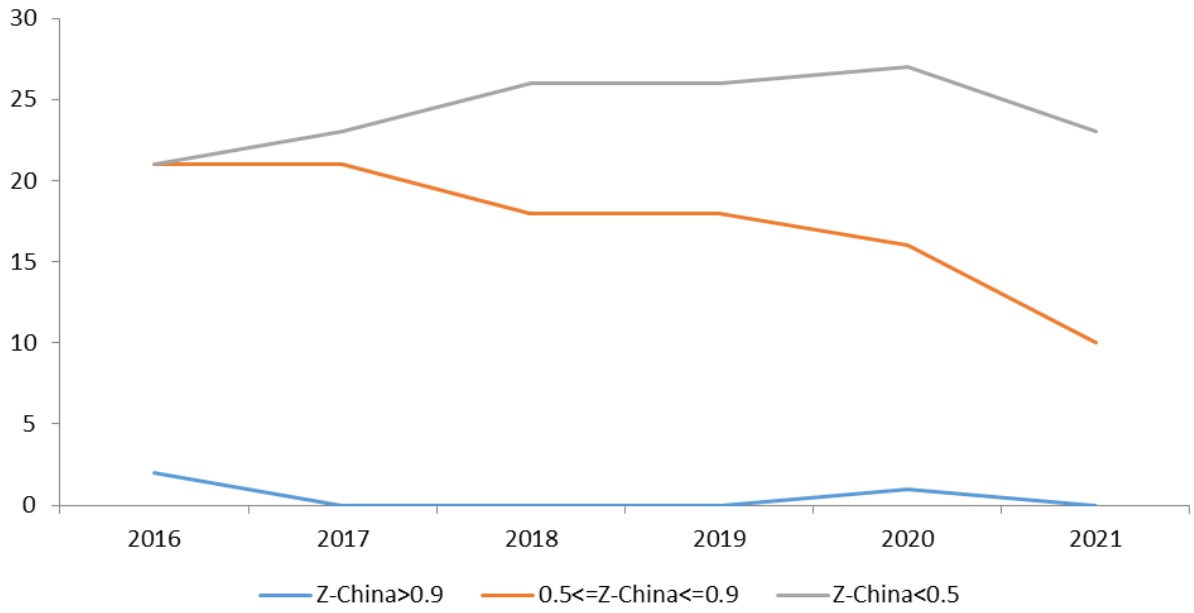
	Ticker	Company Name	2016	2017	2018	2019	2020	2021	Average
1	2202.hk	CHINA VANKE-H	0.58	0.51	0.49	0.48	0.51	0.44	0.50
2	3333.hk	CHINA EVERGRAND	0.31	0.38	0.43	0.34	0.28	NA	0.35
3	960.hk	LONGFOR GROUP HO	0.90	0.69	0.70	0.67	0.66	0.66	0.71
4	2007.hk	COUNTRY GARDEN	0.44	0.44	0.41	0.42	0.40	0.43	0.42
5	600048.sh	POLY DEVELOPME-A	0.72	0.65	0.63	0.65	0.60	0.58	0.64
6	1918.hk	SUNAC	0.33	0.15	0.37	0.45	0.51	NA	0.36
7	001979.sz	CHINA MERCHANT-A	0.72	0.81	0.79	0.63	0.53	0.51	0.66
8	3380.hk	LOGAN GROUP CO L	0.77	0.84	0.80	0.84	0.93	NA	0.84
9	600606.sh	GREENLAND HOLD-A	0.34	0.35	0.33	0.34	0.32	0.24	0.32
10	600340.sh	CHINA FORTUNE-A	0.53	0.55	0.59	0.67	0.43	-0.58	0.37

11	600383.sh	GEMDALE CORP-A	0.93	0.73	0.67	0.68	0.62	0.53	0.69
12	884.hk	CIFI HOLDINGS GR	0.75	0.67	0.55	0.55	0.52	0.53	0.60
13	000069.sz	SHENZEN OVERSE-A	0.99	0.87	0.80	0.69	0.66	0.51	0.75
14	1030.hk	SEAZEN GROUP LTD	0.32	0.36	0.35	0.30	0.37	0.40	0.35
15	000656.sz	JINKE PROPERTI-A	0.53	0.44	0.47	0.45	0.46	0.38	0.45
16	1813.hk	KWG GROUP HOLDIN	0.71	0.62	0.45	0.60	0.61	0.50	0.58
17	3383.hk	AGILE GROUP HOLD	0.81	0.87	0.71	0.58	0.65	0.55	0.69
18	002146.sz	RISESUN REAL -A	0.66	0.62	0.66	0.70	0.64	0.15	0.57
19	2777.hk	GUANGZHOU R&F -H	0.75	0.85	0.63	0.62	0.51	0.16	0.59
20	1233.hk	TIMES CHINA HOLD	0.67	0.72	0.79	0.73	0.59	0.49	0.67
21	000671.sz	YANGO GROUP CO-A	0.47	0.39	0.39	0.42	0.42	-0.07	0.34
22	3883.hk	CHINA AOYUAN GRO	0.46	0.48	0.36	0.37	0.40	NA	0.41
23	600208.sh	XINHU ZHONGBAO-A	0.51	0.63	0.62	0.57	0.40	0.58	0.55
24	6158.hk	ZHENRO PROPERTIE	0.38	0.34	0.41	0.44	0.40	0.27	0.37
25	2772.hk	ZHONGLIANG HOLD	0.07	0.16	0.22	0.33	0.33	0.29	0.23
26	3900.hk	GREENTOWN CHINA	0.49	0.38	0.40	0.41	0.42	0.40	0.42
27	1638.hk	KAISA GROUP	0.11	0.36	0.27	0.47	0.51	NA	0.34
28	1238.hk	POWERLONG REAL	0.71	0.70	0.53	0.54	0.67	0.59	0.62
29	1628.hk	YUZHOU GROUP HOL	0.67	0.75	0.67	0.57	0.39	0.44	0.58
30	600466.sh	SICHUAN LANGUA-A	0.47	0.48	0.49	0.47	0.41	-0.63	0.28
31	600823.sh	SHANG SHIMAO-A	0.63	0.65	0.69	0.55	0.48	0.47	0.58
32	1966.hk	CHINA SCE GROUP	0.73	0.67	0.61	0.44	0.52	0.49	0.58
33	2103.hk	SINIC HOLDINGS-H	0.19	0.15	0.19	0.39	0.44	NA	0.27
34	3377.hk	SINO-OCEAN GROUP	0.60	0.66	0.39	0.53	0.48	0.49	0.53
35	600325.sh	ZHUHAI HUAFA-A	0.51	0.49	0.45	0.45	0.44	0.47	0.47
36	3301.hk	RONSHINE CHINA H	0.48	0.42	0.39	0.46	0.44	0.37	0.42
37	000732.sz	TAHOE GROUP CO-A	0.46	0.40	0.36	0.21	0.00	NA	0.29
38	1622.hk	REDCO PROPERTIES	0.67	0.72	0.54	0.40	0.44	0.38	0.53
39	832.hk	CENTRAL CHINA	0.43	0.31	0.26	0.27	0.24	0.15	0.28
40	1777.hk	FANTASIA HOLDING	0.44	0.42	0.26	0.24	0.30	NA	0.33
41	2608.hk	SUNSHINE 100 CHI	0.24	0.33	0.20	0.32	0.24	NA	0.27
42	1107.hk	MODERN LAND	0.48	0.38	0.27	0.25	0.32	NA	0.34
43	1862.hk	JINGRUI HOLDINGS	0.09	0.41	0.48	0.40	0.40	NA	0.36
44	817.hk	CHINA JINMAO HOL	0.47	0.39	0.48	0.40	0.30	0.30	0.39
		Average	0.53	0.53	0.49	0.48	0.46	0.35	0.47

Below is the $Z_{\_China}$ score classification from 2016-2021, and it is found that more companies transferred from grey area to distressed area, suggesting that general credit performance deteriorated gradually in the past six years. The scores of 2 companies reached healthy area in 2016 while half of the remaining companies stayed in grey area, but scissors difference appeared in the years after, and the number of the companies that stayed at dangerous area achieved a record high number of 27 in 2020 while there was only one healthy company. The scores of three companies were negative in

2021 including China Fortune, Yango Group and Sichuan Languang. Actually, all of the three companies already defaulted publicly by the end of 2021, and also around 20 of 44 sample companies have experienced public default or debt restructuring by the end of April of 2022.

Figure 6 $Z_{\_China}$ score area classification and trend from 2016 to 2021



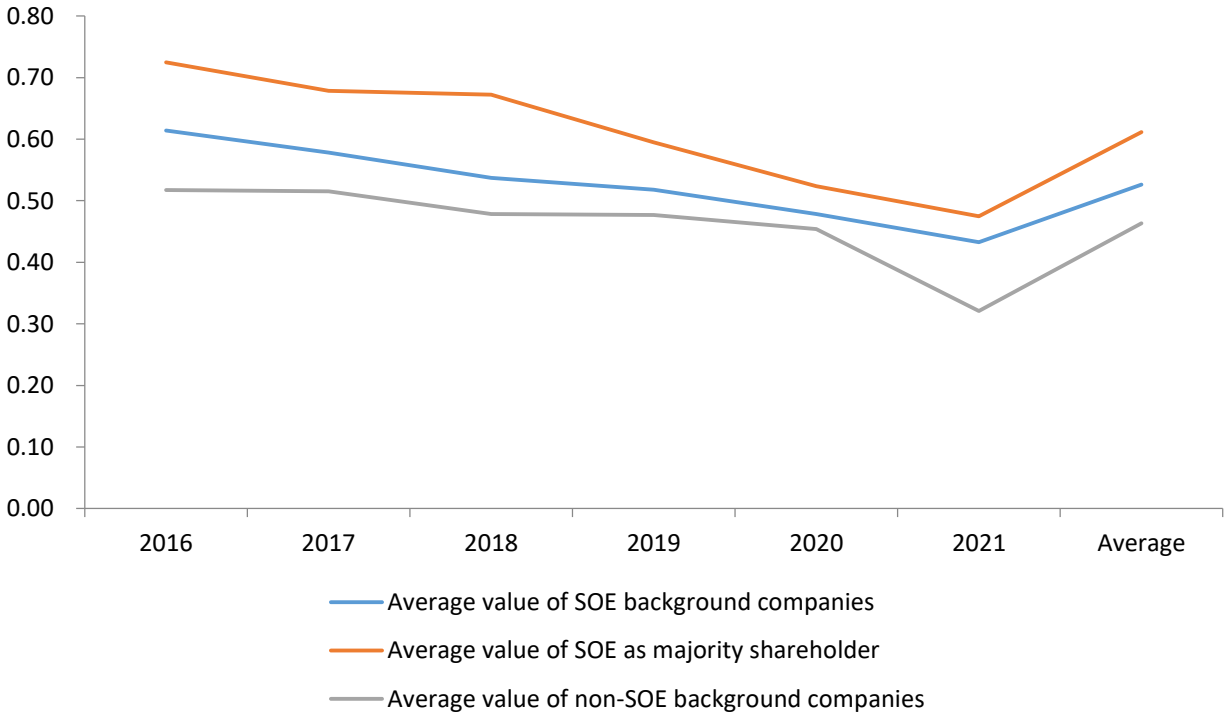
Note: the total number of sample companies decreased to 33 in 2021 because there are 11 companies didn't disclose their annual report by the end of April.

$Z_{\_China}$ score modeling relies highly on the financial statements of the underlining companies, especially leverage ratio, profitability ability and also the liquidity. Chinese real estate industry is highly regulated by central and local governments. Therefore, $Z_{\_China}$ score is very sensitive to the changes of public policies, especially the industry regulation measures like "three red lines", restriction on the use of pre-sale funds, and also monetary policies like interests rate of

construction loan and window guidance on the volume of mortgage loan.

Also, it is obvious that the average value of $Z_{\_China}$ score of developers with SOE background is relatively higher than the value of non-SOE companies, and also the average value of the companies with SOE as their majority shareholder is higher than the companies with SOE as their non-controlling shareholder, which means that companies with SOE background have better credit performance than private companies.

Figure 7 Comparison of Z_China score of companies with SOE and non-SOE background



The results of the above modeling demonstrate that the credit of China's real estate industry really kept deteriorating in the past six years, and is still getting worse quickly if we look at the real number of the first half of 2022. It can be predicted that there will be more

developers going default in the coming 1-2 years and most players of the industry will face great challenges regarding onshore and offshore financing based on the test results of $Z_{\_China}$ score.

CHAPTER 4：CONCLUSIONS & FUTURE RESEARCH

Real estate industry in China have experienced more than 15 years rapid growth and suddenly dropped into the darkest moment after 2011,. Also, the creed of “Too big to fall” in China’s real estate industry will no longer work since the public default of Evergrande. Investors and scholars began to speculate whether Evergrande is just a fortuitous event or the beginning of collapse of the whole China’s real estate industry. Many scholars have done a lot of research on the policy environment, supply-demand relationship and credit analysis of the industry, and also have carried out many valuable theories, models and conclusions. This paper studied the relative research literature and delivered a comprehensive summary, which composed of the basic methodology for the subsequent research.

This paper made systematic research on the key factors that affect the credit stability of real estate industry in China mainly from the perspective of public and industry policy, balance of supply-demand relationship and financial risk respectively.

Firstly, in terms of the public policy, this paper concludes that “Three red lines” and “strictly monitoring on the pre-sale capital” play a determinant role in this round of credit crash down among all the related policies, and central and local government have already begun to loosen monetary and regulatory policies such as lowering down interests rate, encouraging banks to provide mortgage loan to house buyers, cancelling the purchase restrictions and etc.. However, it is hard to see any clear signals for the turnround of the financing environment for private developers and local governments’ strict monitoring on pre-sale capital. Also, considering central governments’ insistence on the deleveraging of real estate industry and local governments’ emphasis on the successful completion of developing projects to ensure the social

stability, it is expected that the policy environment is still not that friendly for the industry.

Secondly, as to the balance supply-demand relationships, this paper lists all the major parameters that affect Chinese residential sales volume. By applying regression and correlation test through EVIEWS, it is found that CPI and growth rate of M2 rank top 2 from the perspective of positive effects to the residential sales. Central government in China issued a new round of economic stimulus plan in May 2022, and the total stimulus package includes tax return, financing guarantee, special debt support, SME lending support and etc. As expected, this round of stimulus will have positive effect on the growth of M2, but there is a clear signal that central and local governments will be very cautious to let the new capital flow into real estate industry. Therefore, there will be limited effects of M2 on real estate recovery due to the restriction.

Thirdly, this paper analyzes the financial risk of a sample portfolio of the developers by introducing the methodology of Z_China score model. Z_China score modeling relies highly on the financial statements of the underlining companies, especially leverage ratio, profitability ability and also the liquidity. The results of the above modeling demonstrate that the credit of China's real estate industry really kept deteriorating during the past six years, and is still getting worse quickly if we look at the real number of the first half of 2022. It is concluded that there will be more developers going default in the coming 1-2 years and most players of the industry will face great challenge regarding onshore and offshore financing based on the test results of Z_China score.

The central government and many local governments began to ease the monetary policy to encourage the mortgage and development loan from commercial banks in order to stimulate the recovery of industry. The listed companies' performance has a great impact on the local economy; and thus, the local government may never let them go default or bankruptcy. It seems

that the effect of the policies is very limited, so “soft landing” for China’s real estate industry and also most of the large scale developers is not that realistic.

Also, the outbreak of COVID-19 also caused great damage to China’s real estate industry. On one hand, the sales of housing market shrunk greatly because in-person visit to the sales center is not allowed for a relatively long time. According to Forbes, the sales of newly constructed houses in Shanghai decreased by 56% from February to early March. Moreover, the headquarter and many developers are forced to shut down, and construction activities are not allowed, which is has a strong negative impact on the on-time completion of many projects. The virus "squeezed" the cash flow of housing developers greatly and really caused negative effects to the industry. And the situation is not likely to change in the coming half year due to the “zero cases” policy from central government.

However, a sudden collapse in the real estate market is surely disastrous for China’s economy, and many sectors would be negatively affected. Bursting real estate bubbles have traditionally done great harm when they are associated with financial crises. Going forward, an important step is to secure China’s financial and economic system, rather than focus solely on maintaining the growth of housing market.

In order to survive in the downturn of the industry, we would suggest Chinese developers to pay more attention to improve the efficiency of the management and financial stability of their companies by reducing leverage ratio and operational cost, improving gross margin and etc., and eventually adapt to the “new normal”, which can be very instrumental for real estate industry in China to get back to a more healthy development track.

I would like to thank Professor Xiaohui Gao Bakshi, Connie Mao, Gurdip Bakshi for their guidance during the process of conducting this study, and thank Mr Jun Yan, Ms Ziyu Zhou, Ms

Siyu Xie for their support throughout the program. I am particularly grateful to my wife Cici for her sacrifice for the family and support on my study.

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