Housing Market Bubble in Jiangsu, China Over the Past Decade: What Are Some Supply and Demand Side Causes?

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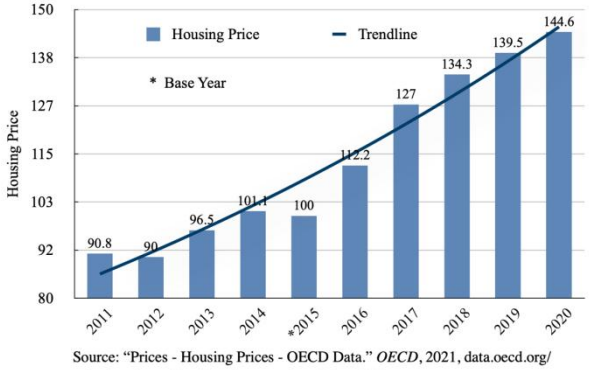
Abstract: The rising housing price in China has been a concerning economic and social issue for years. Adopting the concept of Net Present Value, this essay first proves that an asset bubble exists in China. With a focus on Jiangsu province, this essay then provides a holistic picture of the demand and supply side causes of the housing bubble by analyzing the relevant data for the past decade. Furthermore, this essay investigates the role of price elasticity of demand and supply as an intensifier of the upsurge of housing price in China. In general, the housing bubble in China is a result of various factors from both supply and demand sides, including rising land prices, increasing urbanization, expansionary monetary policies, an underdevelopment financial market, the rigidity of the production of houses, and Chinese people's unique complex of housing ownership. This essay ends by putting the conclusion in the context of nowadays COVID-19 pandemic. In doing so, it reveals the dilemma faced by today's Chinese government: whether to let the bubble burst at the cost of present loss or arbitrarily sustain the bubble at the cost of future risk.

Keywords: Housing Bubble; Land Finance; Urbanization; Excessive Money Supply; Price Elasticity

1. Introduction

Over the past decade, the Chinese housing market has experienced an unprecedented boom, indicated by the soaring housing price, which is demonstrated in *Figure 1* below. Based on the data, the Chinese housing price increased nearly 60% from 2011 to 2020 and is likely to keep surging in the future. Yet the rising price is not enough to justify the existence of an economic bubble in the Chinese housing market

Figure 1: Chinese Nominal Housing Price, 2011~2020



Source: "Prices - Housing Prices - OECD Data." *OECD*, 2021, data.oecd.org/price/housing-prices.htm. Accessed on 3 June 2021.

An economic bubble, by definition, is the economic phenomenon characterized by assets trading at a price that significantly exceeds their intrinsic value. Therefore, a solid justification of the Chinese housing bubble requires a comparison between the *intrinsic* and *market value* of houses in China, for which the Net Present Value (NPV) is an effective tool. NPV measures the current value of an asset by discounting its future returns to the present, which is calculated by the following formula[1]: \\

$$NPV = \sum_{t=0}^{n} \frac{CF_t}{(1+r)^t}$$

where t represents the time, beginning with 0; n represents the upper limit of t; CF_t represents the net cash inflow-outflows during the period t; r represents the discount rate, the rate of return that could be earned from an alternative investment. In the case of a house, NPV evaluates its profitability by considering its intrinsic value, which is the expected return of owning a house—the rental income, and the cost of purchasing it, which includes monetary and opportunity costs—the returns from an alternative investment.

Among numerous possible ways to buy a house in China, the most common one involves a 20-year mortgage with a 30% down payment and an equal amount of repayment including principal and interest each year[2]. According to Anjuke, a leading housing brokerage company in China, the average Chinese housing price is $3220 per square meter[3] and the average Chinese housing rental price is $88 per square meter[4]. Moreover, the Chinese average mortgage rate is 5.33%[5]. At the time of writing, the Chinese national government bond, the safest type of investment in China, has a 3.9% rate of return[6]. Applying the aforementioned data to the formula of NPV, we obtain:

$$NPV = \frac{-966+88}{(1.039)^0} + \frac{-185.5+88}{(1.039)^1} + \frac{-185.5+88}{(1.039)^2} + \ldots + \frac{-185.5+88}{(1.039)^{20}} + \frac{88}{(1.039)^{21}} + \frac{88}{(1.039)^{22}} + \ldots = -1166.9$$

where 966 is the down payment per square meter; 185.5 is the yearly repayment per square meter, calculated by the Amortization Formula[7]. For the first 20 years ($t \leq 0$), the net cash flow of buying a house is its renting profit subtracting the payment. After 20 years, the mortgage is cleared, so that there is no repayment cost but profit of owning the house, which is the rental.

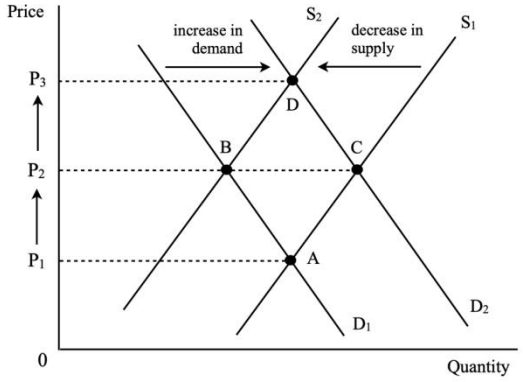
Note that all the statistics used in the formula, including its result, are in per square meter. Moreover, it is important to notice that the calculation, for the sake of simplicity, ignores a number of other costs of owning a house—maintenance, taxes, insurance, etc—and returns of owning a house—sense of security, happiness, appreciation, etc.

A negative NPV reveals that the cost of buying a house exceeds its returns, that is the market value of a house exceeds its intrinsic value, which justifies the existence of an economic bubble[8]. With that being said, a deeper concern would be the causes of the bubble, which is the issue to be addressed in the rest of the essay. To provide a more in-depth analysis, I will focus on the situation in Jiangsu, China over the last ten years, during which the province experienced a 70% of housing price increase[9].

2.Supply and Demand

Given the upsurge of the housing price in Jiangsu, China, the cause must be either a decrease in supply or an increase in demand, or both, as illustrated in *Figure 2.*

Figure 2: The Jiangsu Housing Market

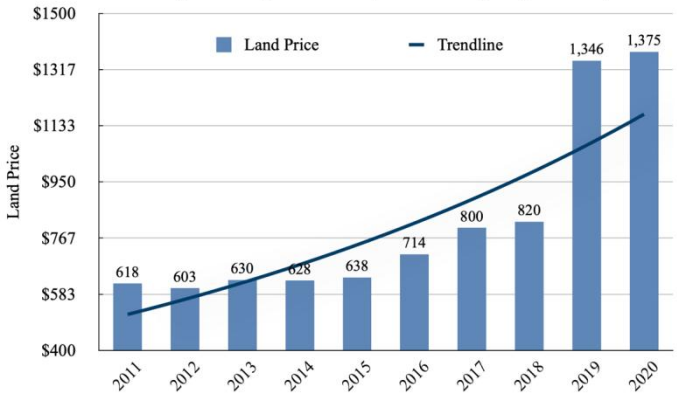


Therefore, the causes of the housing bubble can be categorized into either demand-side factors or supply-side factors. This essay investigates both the demand and supply sides, aiming to provide a comprehensive analysis of the housing bubble.

3.Supply-Side Causes: Land Price

Within the last ten years, the land price of Jiangsu soared over 222%, which is illustrated in *Figure 3*. Just in 2019 alone, the land price, due to the decrease and cancellation of price ceiling on land in many regions of Jiangsu[10], increased over 64% from $820 to $1346. The rapid growth of the land price in Jiangsu over the past decade corresponds to the province's 70% upsurge of the housing price at the same period of time, implying a strong correlation in between.

Figure 3: Jiangsu Land Price, 2011~2020 (per square meter)



Source: "City Land Price Monitoring Data." Translated by Yanhao Wang, *China Land Price Monitoring Network*, Chinese Land Surveying and Planning Institute, 2021, www.landvalue.com.cn/Lvmonitor/Index. Accessed on 11 June 2021.

Before delving into the potential impact of the rising land price on the housing market, we first need to understand its root. In 1994, China adopted a new tax system—a tax-sharing system. Under this system, taxes are divided into three types: a central tax that generates revenue for the central government, a local tax that generates revenue for the local government, and a shared tax that generates revenue shared by the central and local government with a fixed ratio. This separation of taxes is based on different duties of the central and local government—as the central government is responsible for affairs of greater expense, the central tax generates significantly greater revenue than the local tax does[11]. However, the problem emerged as the local government often fails to obtain enough revenue to fulfill its duties under this system—the separation of taxes based on duties is unfair. Consequently, the local government must find alternative methods to generate revenue, within which land finance, a financial strategy with which local government generates revenue by transferring land ownerships to private businesses such as housing developers, is most frequently adopted[12].

Figure 4: Jiangsu, China Local Government Land-transferring Revenue, 2011~2020

Year	Revenue from land transferring (in billion)	Percentage increase (compared to 2011)	Proportion to total government revenue
2020	$169.9	326.9%	70.0%
2019	$137.0	244.2%	68.3%
2018	$119.7	200.8%	68.2%
2017	$101.3	154.5%	48.3%
2016	$86.9	118.3%	40.3%
2015	$64.5	62.1%	31,1%
2014	$59.9	50.5%	39.0%
2013	$49.3	23.9%	34.9%
2012	$50.1	25.9%	38.5%
2011	$39.8	0.0%	34.8%

Source: "*Government Budget and Final Accounts*." Translated by Yanhao Wang, Jiangsu Department of Finance, 2021. czt.jiangsu.gov.cn/col/col77316/index.html. Accessed on 11 June 2021.

Figure 4 includes the government revenue of Jiangsu generated via land transferring over the past decade. As we can see, the figure skyrockets, exhibiting a 326.9% of increase within ten years. Furthermore, the land-transferring revenue is also rising as a percentage of the total government revenue, reaching 70%. The data shows that the Jiangsu local government, similar to other Chinese local governments, has been generating an increasingly large amount of revenue through land finance. However, the land resource is

ultimately limited and non-renewable. Thus, the expanding government revenue from land-transferring relies at least partially on the Jiangsu provincial government raising the land price.

Land is one of the most essential factors in the production of houses. A continuous increase in land price means a continuous increase in the cost of production, a supply-side shock that would theoretically increase the housing price, which could reflect the upsurge of the housing price in Jiangsu, China today. In fact, the relationship between land price and housing price extends beyond simple causality.

The local government transfers land by auction. Realizing the unceasing growth of the housing price, suppliers of houses are willing to bid higher for the land because they know that the revenue will be able to cover the cost. Therefore, the land price is continuously being pushed higher. In other words, rather than forming a one-way causal relationship, the land price and housing price *mutually* promote one another[13].

4.Demand-Side Causes

As reflected in *Figure 2*, any market outcomes, including a surge of price, is the combination of supply and demand forces. As the land price provides an explanation of the supply-side force, we will now delve into the demand side, analyzing what are the exogenous factors that incur the escalation of demand for houses and thus the housing price.

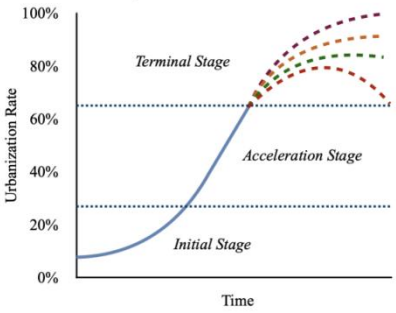
4.1 Urbanization

According to the principles of economics, a crucial determinant of the demand for products is the population of consumers in the market—with more consumers comes greater demand for a particular product. This theory also applies to the Jiangsu housing market, in which case urbanization plays a crucial role. Urbanization refers to the increase of the population living in towns and cities, which is primarily caused by people migrating from rural to urban areas. The urbanization rate of Jiangsu, China in the past ten years is illustrated in *Figure 5* below.

Figure 5: Urbanization in Jiangsu, China, 2011~2020

Source: Jiangsu Provincial Bureau of Statistics. Translated by Yanhao Wang, *Jiangsu Statistical Yearbook,* Jiangsu Provincial Government, 2021, tj.jiangsu.gov.cn/col/col4009/index.html. Accessed on 16 June 2021.

Figure 6: The Urbanization Curve



Source: Nur Huzeima Mohd Hussain. University of Auckland, 2015, *FROM KAMPONG TO CITY AND BACK AGAIN: A Case Study of De-Urbanisation in Malaysia.* Accessed on16 June 2021.

Based on the statistics, the urbanization of Jiangsu exhibits persistent growth. Compared to ten years earlier, 10% more of Jiangsu people settle down in towns and cities nowadays. *Figure 6* depicts the urbanization curve, the prediction of different stages of urbanization that a region will experience. As indicated in the graph, the process of urbanization in a particular region is divided into 3 stages: initial, acceleration, and terminal. The dotted lines with different colors reflect different possible scenarios of urbanization during the terminal stage. Applying the urbanization curve to the situation in Jiangsu, we can infer that the past decade has brought Jiangsu from the acceleration stage to the terminal stage, which is a great leap. Furthermore, the urbanization of Jiangsu 30 years ago, in 1990, was merely 21.6%[14], meaning that it only took 30 years for Jiangsu to transfer from the initial stage to the terminal stage, while it took Texas 60 years[15].

Since people need a place to live, such a swift influx of population in urban areas increases the demand for houses, which in turn lifts the housing price. The impact of urbanization on the housing price is, in this case, essentially the impact of the increasing population. As China has recently extended the birth limit to three children, we will most probably see the population of China keep

expanding in the future[16]. That means the massive demand is likely to keep rising and putting upward pressure on the housing price in not only Jiangsu but China as well.

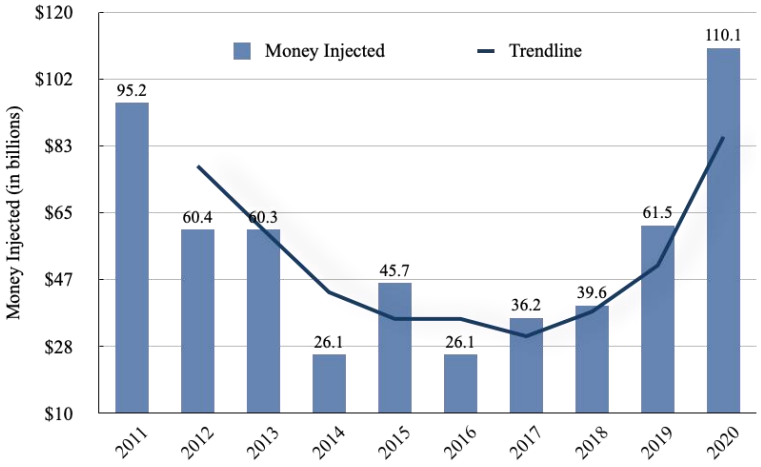
4.2 Monetary Policy

The previous sections analyzed the causes of the Jiangsu housing bubble on a local scale. However, it is important to notice that nationwide factors, such as the monetary policy, also influence the housing market in Jiangsu.

Monetary policy is implemented by the central bank of a nation to achieve macroeconomic goals by manipulating the money supply—the total amount of money in the circulation of an economy—and consequently the interest rate. In general, the Chinese monetary policy over the past decade has been *expansionary*, implying that the government has been increasing the money supply, which could be done mainly through three methods: expansionary open market operations, interest rates cut, and reducing the reserve requirement ratio. This section discusses each of the three methods, aiming to provide a holistic view of how expansionary monetary policies boost the demand for houses and thus the housing price.

Open market operation is the tool used by the central bank to inject or extract money into or from the economy by buying or selling securities in the open market. *Figure 7* includes the net amount of money injected into the Chinese economy yearly by the central bank from 2011 to 2020. Despite the great fluctuation of the amount of money injected each year, the central bank has been constantly pumping money into the economy, which leads to a total amount of 561.2 billion dollars injected into the circulation in the past decade. This sharply raises the money supply.

Figure 7: Net Money Injection into the Chinese economy, 2011~2020

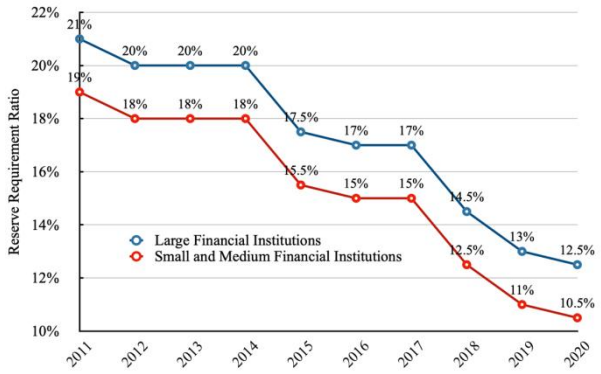


Source: The People's Bank of China. Translated by Yanhao Wang, *Financial Statistics Report*, Statistics and Analysis Department, 2021. www.pbc.gov.cn/diaochatongjisi/116219/116225/11871/index20.html. Accessed on 24 June 2021.

Expect for open market operations, the central bank increases the money supply indirectly by decreasing interest rates. *Figure 8* includes the interest rate of loanable funds in China within the recent ten years. Although the interest rate of China remained unchanged for the last six years of the recent decade, the interest rate has declined overall from 6.56% in 2011 to 4.35% in 2020. A lower interest rate means a lower cost of borrowing, incentivizing people to borrow more, which helps increase the money supply by adding more funds into the economy in the form of loans. Moreover, a lower interest rate also means a lower mortgage rate, which encourages people to buy houses and thus directly increases the housing demand.

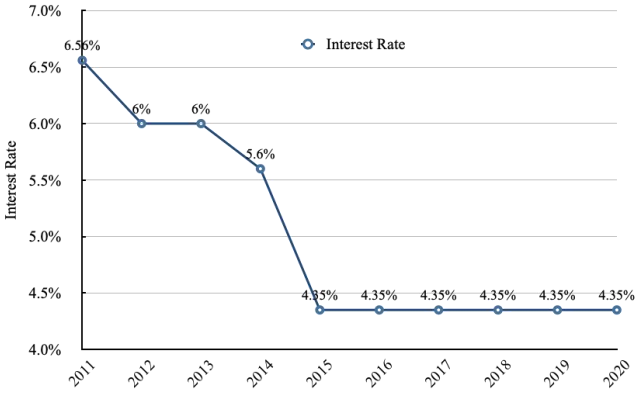
Lowering the reserve requirement ratio is another indirect approach with which the central bank increases the money supply. The reserve requirement ratio is a percentage determined by the central bank that sets the proportion of assets that other financial institutions must hold in reserve instead of lending out. *Figure 9* illustrates the reserve requirement ratio in China over the past

Figure 9: Reserve Requirement Ratio in China, 2011~2020



Source: "Chinese Reserve Requirement Ratio." Translated by Yanhao Wang, *East Money Data Center*, 2020, data.eastmoney.com/cjsj/ckzbj.html. Accessed on 24 June 2021.

Figure 8: Interest Rate in China, 2011~2020



Source: "Lending Interest Rate (%) - China." *The World Bank*, 2021 data.worldbank.org/indicator/FrFR.IN R.LE ND?end=2020&locations= CN&start=2010&view=chart. Accessed on 24 June 2021.

decade. As it appears in the graph, the reserve requirement ratio has been declining consistently and dramatically from 20% to 11.5% on average between 2011 and 2020, regardless of the size of the financial institutions. A lower reserve requirement ratio allows financial institutions to lend more funds to borrowers. This in turn allows more money to circulate in the economy, in which case the money supply is increased.

As shown previously, expansionary monetary policies contribute to a massive money supply in China. Yet a massive money supply doesn't necessarily prompt an increase in the demand for goods if the growth of money supply is accompanied by a roughly equivalent level of growth in real economic output. Unfortunately, this is not the case in China. *Figure 10* compares the money supply with GDP in China for the past decade. Apparently, the level of money supply significantly exceeds the economic output. Holding an excessive amount of wealth, people are likely to spend more, potentially in the housing market, which increases the demand and thus the price of houses. However, we need to address one more question to make this logic chain work: why the housing market? Why people choose to spend their excessive wealth in the housing market instead of other places

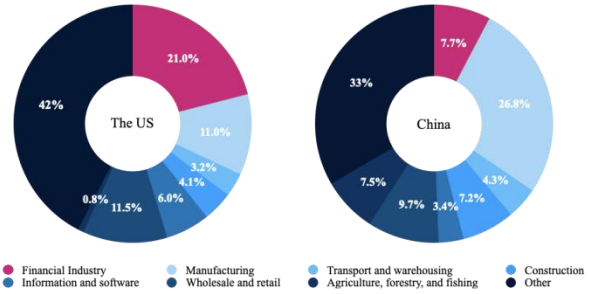
Figure 10: GDP and Money Supply (M2) in China, 2011~2020

Source: "China Money Supply and GDP." Translated by Yanhao Wang, *Value500 Investment Guide*, 2021, value500.com/M2GDP.html. Accessed on 25 June 2021.

4.3 Underdeveloped Financial Market

A straightforward answer would be that in China, the housing market is the best place to invest the money because the Chinese financial market, the most crucial investment alternative, is to some extent underdeveloped in terms of its size, innovativeness, and stability[17].

Figure 11: A Comparison between the GDP Composition of the US and China, 2019



Source: Majumdar, Rumki. "Changing the Lens: GDP from the Industry Viewpoint." *Deloitte Insights*, 24 July 2019, www2.deloitte.com/us/en/insights/economy/spotlight/economics-insights-analysis-07-2019.html. Accessed on 28 June 2021.

Source: "Regarding 2019 Chinese GDP ." Translated by Yanhao Wang, *The People's Republic of China*, National Bureau of Statistics, 30 Dec. 2020, www.gov.cn/xinwen/2020-12/30/content_ 5575114.htm. Accessed on 28 June 2021.

Compared with developed countries like the US, the size of the Chinese financial market severely falls behind. Take the stock market as an example: the New York Stock Exchange, the greatest sock exchange in the US, has a market capitalization of 29 trillion with 2300 listed companies, while the Shanghai Stock Exchange, China's greatest stock exchange, has only 4.7 trillion of markets capitalization and 1561 listed companies[18]. Furthermore, *Figure 11* compares the 2019 GDP composition of China and the US. In comparison to the US financial market, which contributes to 21% of the US total GDP in 2019, the Chinese financial market only accounts for 7.7% of the total GDP.

Besides its relatively small size, the Chinese financial market lacks the necessary innovativeness. The Chinese financial market is regulated under a separate operation, meaning that the operation of sub-industries in the financial sector—investment banking, securities, insurance, etc—are divided[19]. This policy leads to limited resources accessible to individual financial institutions and the difficulty for institutions to corporate for greater efficiency[20], which causes the incapability to innovate in terms of financial instruments and investment channels. The former is indicated by the lack of diversity in financial derivatives, and the latter is indicated by the overly predominant role of banks followed by the underdeveloped markets of securities, bonds, insurance, etc[21].

Based on all aforementioned, the Chinese financial market is comparably immature. Thus, those who hold excessive money due to the expansionary monetary policy are less willing to invest in the financial market. Alternatively, the housing price has been persistently soaring for years, which, compared to the underdeveloped financial market, is definitely a more reliable and profitable investment. To sum up, the combination of expansionary monetary policies and the underdeveloped financial market, together with urbanization, boosts the demand for houses.

5. Price-Elasticity of Supply and Demand

However, this is not yet the whole picture. Housing prices as high as in today's China would make sense only if we bring the concept of elasticity into our conversation. The price-elasticity of houses refers to the sensitivity of the supply and demand for houses to the price. As the following discussion argues, both the demand and supply for houses in China are price-inelastic, meaning that changes in quantity demanded or supplied will lead to proportionally greater change in price, which could explain the upsurge of housing price in China.

Among all the determinants of the elasticity of supply, the ability for producers to adjust production plays a crucial role, which heavily depends on the flexibility of the factors of production. As mentioned previously, the land is a very significant resource to build houses, and it is extremely nonrenewable and inflexible. Thus housing producers are incapable of freely adjusting the supply of houses, leading to a price inelastic supply for houses, at least in the short run. Another factor that influences producers' ability to efficiently adjust production is the procedure of doing so. For houses, the time taken for houses to be constructed is extremely long; moreover, the government places strict regulations on housing construction: the planning, building, and selling of houses all require the approval of the government[22]. Overall, the production of houses is time-consuming and the essential resource for housing construction is highly limited and inflexible, which renders housing supply price-inelastic.

On the other hand, the price-inelasticity of demand for houses is perhaps more straightforward: houses are *necessities* to Chinese citizens. People purchase necessities regardless of the change in price because necessities, as the name suggests, are sorely needed,

which leads to price-inelastic demand. In general, Chinese people have a unique complex for housing ownership, mainly because they perceive a house as more than a living place[23]. To better illustrate this argument, I conducted a survey to investigate Chinese people's perception on houses.

Among 500 respondents, the vast majority perceive a house as able to provide a sense of security, insurance for the next generation, guarantee of happiness, etc. The value of a house in the perspective of Chinese citizens extends beyond that. According to the survey, 23.4% of the respondents believe that one must have a house in order to be regarded as successful. Moreover, 21% of people require their future partner, or the future partner of their children, to have a house. All these extra "values" of houses put a great pressure on the younger generation to buy a house: based on the survey, as many as 67.6% of people think that the first house should be purchased at the age of 26~35. This result echoes the research done by HomeLink, that the average age of first-house buyers in China was 29.5, while this figure in the UK and the US were 35 and 41, respectively[24].

Generally, a house is extremely necessary for Chinese citizens. When asked to rate the overall necessity of owning a house, 46.8% of respondents answered that "it's a must". Behind this astounding number rests Chinese citizens' irreversible mentality of house ownership, which contributes to the price-inelasticity of demand for houses.

6.Conclusion

Will the bubble burst? Up to this point, this is probably the most concerned questions. In fact, from a historical perspective, all bubbles burst, and it seems like the Chinese housing bubble would not be an exception. In face of the COVID-19 pandemic, the government's Zero-Case policy has brought the inevitable side-effect of economic slow-down. From the beginning of 2020, when COVID hit, to the present, the year-on-year price change of new homes in China has dropped from 10% to -1.3%. Over 30 property companies in China have defaulted on debts. Country Garden, the largest property developer of the country, has reported a 96% of profit plummet in the first half of 2022[25].

However, the government will not easily let the bubble burst. Reports show that Xi is preparing to inject billions of dollars to sustain the housing market. Yet this is highly controversial. George Magnus from the University of Oxford pointed out the similarity between sustaining the housing bubble and the Ponzi scheme—using borrowed money to repay current debts[26]. Furthermore, economist Xu Xiaonian has warned the government in his book *China: Market Economy or Planned Economy* for the risk of government debt and over-reliance on government spending to boost the economy[27]. Therefore, it seems like the Chinese government is trapped in a dilemma of sustaining the bubble at the cost of future economic risk or just let it burst.

In fact, there should be no doubt that the crash of the property market, which accounts for 20 to 30% of China's GDP, will threaten the stability of China's economy and the well-being of Chinese citizens. Future risk or present loss? This is a tough decision for the Chinese government that has to be made quick.

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