Derisking Real Estate in China’s Hybrid Economy

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This article examines the risks faced by China's real estate sector within its distinct hybrid economy, which combines market mechanisms with comprehensive state planning and government intervention. The real estate sector holds particular importance as land sale revenues are a crucial source of funding for local governments, enabling them to finance infrastructure projects and stimulate economic growth. Banks are highly exposed to debt secured by real estate properties, not only involving real estate firms and households but also extending to local governments and affiliated companies. The hybrid structure gives the government a strong commitment and the ability to delay a real estate crisis. However, China’s real estate risk is ultimately tied to the country’s overall economic growth and remains susceptible to policy-related risks.

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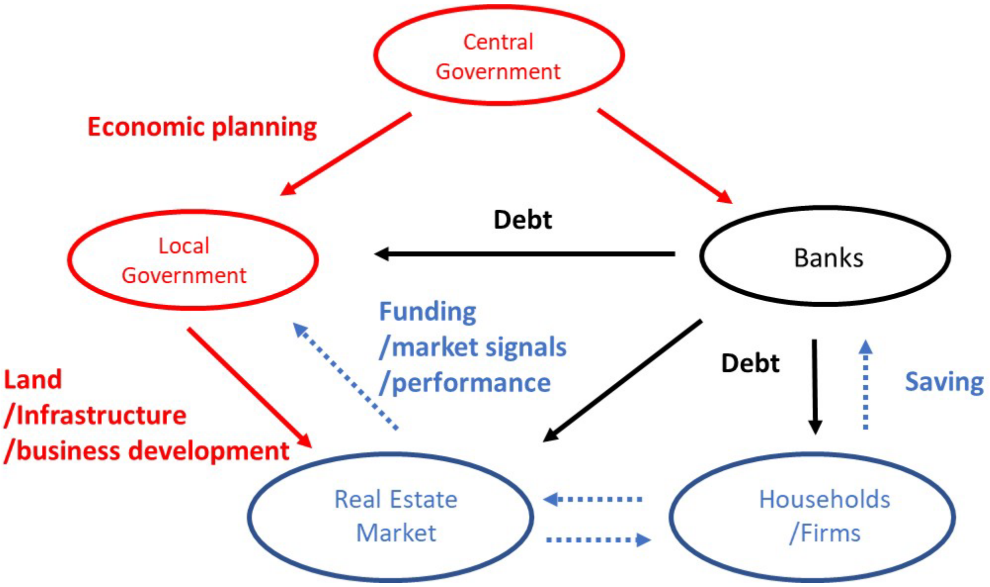
Over the past three decades, real estate has played a critical role in driving China's economic growth, with real estate investment contributing to approximately 10% of GDP and the real estate and construction sector accounting for over 15% of urban employment in recent years, e.g., Rogoff and Yang (2021). But China's real estate sector is now facing a host of challenges. One of the most pressing issues is the debt problem that is plaguing many real estate firms. In 2021, Evergrande, one of the largest real estate companies in China (with a total asset of over 2.3 trillion RMB and a total debt of over 1.9 trillion RMB at the end of 2020) was at the brink of defaulting on some of its debt. This has led to concerns about the stability of the market and the broader financial system. In addition, concerns have been raised about the health of the Chinese real estate market due to drops in real estate prices, an increase in unsold housing inventory in many cities and a slowdown of the urbanization process, leading to further fears of a broader economic slowdown, e.g., Glaeser et al. (2017) and Liu and Xiong (2020). Moreover, in 2022 there have been reports of a boycott of mortgage payments by home owners in some cities, which has put pressure on banks and further raised concerns about the financial stability of the banking sector. Finally, there are even more general concerns about China's demographics. In 2022, China's birth rate has dropped below its death rate for the first time. As the population ages and the birth rate decreases, there may be a lack of long-run demand for housing, e.g., Rogoff and Yang (2021). All of these challenges are adding to the uncertainty and risk not just in the Chinse economy, but also the potential contagion effects to the global economy.

To gain a better understanding of the challenges facing China's real estate market, it is important to consider it within the context of China's hybrid economy. Over the past 40 years, China has adopted many features of free markets, but the government remains heavily involved in using direct and indirect measures to intervene in the economy. The Chinese economy is a mix of state-owned enterprises (SOEs) and private firms. Although private firms now account for over 70% of urban employment, they mostly operate in peripheral industries. On the other hand, through several rounds of SOE reforms, SOEs have become more profitable and tend to dominate strategically important industries. Moreover, the State continues to set overall direction and goals for the economy through the Five Year Plans and other economic planning. It uses promotion and other career incentives to direct and motivate local governments and SOEs to implement its economic planning. Additionally, incentives such as tax subsidies and financial grants, regulations, and administrative orders are used to guide private firms. Despite initial expectations that China would eventually adopt a free-market economy similar to Western countries, this outcome appears unlikely in the near future. Instead, the current Chinese leadership has affirmed its commitment to maintaining a hybrid economy that blends elements of a planned economy with those of a market economy. This hybrid economy is intended to allow the state to have a strong capacity to intervene during economic downturns and to overcome market externalities, while also capitalizing on the market's economic efficiencies. See Xiong (2023) for an overview of China's hybrid economy.

Figure 1: China's Real Estate Sector


Central Government
Economic planning
Local Government
Debt
Banks
Funding /market signals /performance
Debt
Saving
Land /Infrastructure /business development
Real Estate Market
Households /Firms

The real estate sector is a vital part of China's hybrid economy, and the challenges it faces are closely tied to this structure. Figure 1 illustrates the hybrid structure of China's real estate sector. The government controls the supply of land, which is the primary input for real estate development, and local governments use revenue from land sales to fund infrastructure and urban development projects. Meanwhile, real estate properties are sold to households and firms in a relatively free market environment. Banks provide debt financing (either directly through bank loans or indirectly through purchasing publicly issued bonds) to all participants in the real estate sector: local governments, which often use future land sale revenues and unsold land as collateral to obtain bank loans; real estate firms, which use land holdings and unsold real estate properties as collateral to finance ongoing projects; households, which take mortgage loans to finance their housing purchases; and firms, which use real estate properties as collateral to finance their real estate purchases or other investments.

This hybrid structure allows the local government to provide infrastructure and public goods, facilitating local businesses and boosting economic growth and development. The real estate market provides feedback to the government's development plan, allowing it to respond to market signals and make informed decisions about urban development and local businesses. Moreover, the market serves as a mechanism to hold the government accountable for implementing its development plan. When this hybrid model functions optimally, state intervention and the market complement each other, balancing market externalities and promoting economic efficiency. However, if the interactions between these two forces are not appropriately managed, they may exacerbate market externalities and undermine economic efficiency.

The hybrid structure may lead to overinvestment and overleverage in China's real estate sector due to several forces. Firstly, local governments are responsible for implementing the central government's economic and social policies, with land sales being a crucial source of fiscal funding for them. Therefore, the central government's policy agenda can significantly impact the real estate sector through its role as the financing channel of local governments, even if the policies are not directly related to real estate. Secondly, local government officials are incentivized by the central government's evaluations of their job performance, which can create short-term incentives for local governments to overinvest in infrastructure to boost local economies and overspend in projects mandated by the central government. These short-term incentives can create funding pressures that lead to incentives to boost local real estate markets so that local governments can sell more land at higher prices.

These short-term incentives are particularly concerning when local governments can use debt financing. Although the central government prohibited local governments from using debt financing before 2008 to discipline the "soft budget problem" of local governments, it granted local governments access to debt financing to implement China's massive post-crisis stimulus in 2008-2010. Since then, local governments have increasingly used debt to finance their operations. The debt financing used by local governments is typically collateralized by future land sales, land, or real estate properties and is typically in the form of bank loans and public debt directly taken by local governments or indirectly through local government financing vehicles (LGFVs).

Real estate-related debt accounts for about 25% of banks' assets in China, and around half of it is connected to local governments, according to Liu and Xiong (2021). Such heavy exposure of banks to the real estate sector makes it systemically important. If a real estate crash were to occur, it could lead to significant bank losses and even trigger a banking crisis. This situation creates an environment where the real estate sector is seen as "too important to fail". Therefore, both central and local governments feel pressure to provide implicit and explicit guarantees to protect the real estate sector from a potential crash. When the real estate market is under distress, the central government may adjust its macroeconomic and monetary policies and loosen mortgage requirements to support the market, while local governments may take direct measures to prevent real estate prices from falling. During real estate downturns, it is common for local governments to remove restrictions on investment home purchases. In some cases, local governments have even issued administrative orders to prohibit real estate firms from reducing residential housing prices below certain limits, as seen during the COVID-19 pandemic.

The explicit or implicit guarantees provided by the government create moral hazard and distortions in both state intervention and the market, thus providing a third channel for overinvestment and overleverage in the real estate sector. With the guarantees from the central government, local governments may be more inclined to use real estate-collateralized debt to boost their short-term performance, further exacerbating the soft-budget problem. Such short-term behaviors may prioritize real estate development over other areas of economic growth, exacerbating local governments' incentives to deliver their development plans. Furthermore, anticipating both central and local governments' incentives to protect the real estate market, real estate firms may have incentives to overbuild real estate properties, and households and non-real estate firms may engage in reckless real estate speculation. Such speculation may distort market prices and reduce the informativeness of real estate prices as market signals. Adding these distortions together, state intervention and the market can exacerbate each other and amplify externalities in the real estate sector, ultimately jeopardizing the financial stability of the real estate sector and worsening the economic efficiency of the wider economy.

The hybrid structure of China's real estate market means that its risks are distinct from those faced by the US real estate market in the mid-2000s. The decline of the US real estate market in 2006 eventually led to the failure of Lehman Brothers in 2008 and a full-blown global financial crisis. Coordination failure, as identified by the seminal work of three Nobel Laureates, Diamond and Dybvig (1983), on a theory of bank runs, and Bernanke (2018), on a diagnosis of the 2008 World Financial Crisis, is one the root causes of financial crises in market economies. When some depositors rush to exit by cashing out, forced liquidation may lead to an otherwise healthy bank's failure, and the cascading effects may drag down other healthy financial institutions, leading to a system-wide financial crisis.

The Chinese government's commitment to financial stability and ability to mobilize local governments, state banks, and SOEs make a western-style debt crisis less likely. The recent example of the Evergrande crisis showed the government's determination and capacity to prevent a potential financial crisis by privately instructing local governments to sort out Evergrande's financial situation and organizing a partial bailout through state-owned banks and firms. Given the vital importance of the real estate sector to the Chinese economy, it is expected that the government will intervene to prevent a financial meltdown and mitigate a hard landing of the market in any future real estate crisis.

While government intervention can help to postpone the disruption of a financial crisis, it may not resolve the structural challenges faced by the real estate sector, which is a crucial part of the Chinese economy. A slowdown in this sector could have significant spillover effects on related industries, such as construction, manufacturing, and finance. This could lead to a decline in economic growth, job losses, and reduced consumer confidence, which could further dampen economic growth. Moreover, if the government uses too much stimulus to prop up the real estate market, it could lead to other economic problems such as misallocation of capital, inflation and financial instability in the long run. Ultimately, the risk of the real estate sector in China is the economic growth risk, which encompasses the broader effects of a potential real estate downturn on the country's economic growth, employment, and stability.

A real estate downturn is particularly difficult for China's hybrid economy, as the country has historically relied on government-led infrastructure investments to spur economic growth during downturns. Local governments depend heavily on revenue from land sales to fund public infrastructure and social services, including the extensive COVID-19 lockdown policies. In recent years, land sales have accounted for approximately 40% of their total revenue. Thus, a slowdown in the real estate market not only creates substantial pressure on the economy but also limits the fiscal capacity of local governments to stimulate economic growth.

Ultimately, the path to derisk China's real estate sector is to find new growth engines for the Chinese economy. Over the past few decades, the real estate sector has been a significant contributor to China's economic growth. However, as the sector faces mounting challenges and risks, policymakers must look for new sources of growth. One proposed solution is to transform China's economy to be more driven by internal consumption rather than exports. However, this transition necessitates the bolstering of consumer confidence and enabling consumers to power the economy, which may not align seamlessly with the state-driven economic model.

In addition to finding new growth engines, policymakers must also find a new financing model for local governments, replacing the reliance on land sale revenues. This could involve exploring alternative sources of revenue for local governments, such as property taxes or other forms of taxation. However, introducing property taxes may face political resistance, as many homeowners in China have treated their properties as an investment, which makes it difficult for them to accept their properties as a basis of taxation. Imposing property taxes would also put pressure on housing prices in the short run, making it even more difficult for local governments to sell land and homeowners to increase their consumption.

The hybrid structure of the real estate sector makes it particularly vulnerable to policy risks. If the central government sets overly ambitious growth targets, local officials may be pressured to rely on land sales or debt financing to fund more infrastructure projects, exacerbating the already high leverage and debt levels of both local governments and real estate developers. This could lead to further systemic risks and worsen the economic efficiency of the economy. Moreover, the government's new policy agenda on common prosperity and other priorities, as examined by Huang (2023) and Noughton (2023), may also shift the hybrid economic system's long-standing focus away from economic growth. This redirection could further slow down growth, thereby increasing pressure on the real estate sector.

The extensive state interventions to maintain financial stability resemble the strategy of binding all boats together to weather a storm, famously employed by the northern army of Cao Cao during the renowned Battle of Chibi in the winter of 208-209 AD during the Three Kingdoms period in ancient China. However, this strategy also exposes the entire system to an unforeseen fire that could burn all boats simultaneously. In other words, if a shock were to ultimately trigger an economic collapse within the Chinese economy, the real estate sector might amplify the shock and collapse along with the economy.

Therefore, it is crucial that the central government takes a prudent and sustainable approach to managing the economy and the real estate sector, prioritizing the stability and sustainability of both over short-term economic and political goals. Structural transformation towards a more consumption-driven economy, investing in new growth engines, and promoting a more balanced supply-demand relationship in the real estate sector can create a stable and sustainable economic environment that benefits all stakeholders and thus gradually reduce the risks in the real estate sector.

1. The Hybrid Real Estate Model

China's transformation from an agriculture-driven economy to an industry-driven economy has been accompanied by a massive wave of urbanization. As economic opportunities shifted from rural areas to cities, millions of people have migrated from the countryside to urban areas in search of better jobs and living standards. This has led to the rapid expansion of cities and the growth of new urban centers. The government has played a significant role in this process, implementing policies and investments aimed at promoting urbanization and improving the living standards of urban residents. This has included the construction of new housing and infrastructure, the development of new industries and employment opportunities, and the improvement of public services such as education and healthcare. The result has been a dramatic shift in the economic structure of China, with a growing share of the population and the economy now concentrated in urban areas. See Liu and Xiong (2020) and Rogoff and Yang (2021) for a summary of China's urbanization process.

In western economies, property tax is a commonly used funding source to pay for local government services and infrastructure. The tax is based on the estimated value of real property, including land and buildings, and is collected by the local government. The funds collected from property taxes are used to pay for a variety of services, including schools, public safety, roads and highways, parks, and other essential services. The specific uses of property tax revenue can vary from one jurisdiction to another, but it is a crucial source of funding for many western economies.

This property-tax-based funding model, as it is used in western countries, had not been a feasible option for China's urbanization. In the early stages of China's urbanization in 1990s and 2000s, most cities were still under-developed and property values were relatively low, making it difficult to generate significant revenue through property taxes. Additionally, the majority of urban housing in China was owned by the government, which meant that the government could not collect property taxes from itself. Debt financing by local governments was not a viable option for funding China's urbanization in its early stages because it would have exacerbated the "soft budget constraint" problem. The "soft budget constraint" refers to the tendency of local governments to over-extend their budgets without sufficient consequences, as the central government is ultimately liable for the debts of local governments. To discipline local governments and prevent them from over-extending their budgets, the central government had to restrict their use of debt financing. As a result, China has relied on other sources of revenue, such as land sales and urban maintenance and construction taxes, to fund its urbanization efforts.[1]

[1] It's useful to note that the tax-sharing reform in 1994, led by Zhu Rongji, the powerful vice premier at the time, shifted a larger proportion of the total budgetary revenue to the central government, which put even more pressure on local governments to find alternative sources of revenue for local spending.

In particular, China has resorted to land sales as an alternative source of funding for its infrastructure development and urbanization, drawing on the experience of Hong Kong. By the Chinese constitution, the government owns all of the land, and the local government in a city can lease a parcel of land to individuals and businesses for a specified period of time. By selling such land usage rights (which are also called land sales), local governments across China have generated significant revenue to fund a wide range of infrastructure projects, including the construction of housing, roads, public transportation systems, and other essential services. The use of land sales to fund infrastructure development has been a key factor in China's rapid urbanization and economic development.

The land sales-based model of funding local government infrastructure development and urbanization in China reflects the overall structure of China's hybrid economy, which combines elements of a planned economy with elements of a market economy. By providing infrastructure often as public goods and facilitating local businesses, the government attracts investment and more immigrants from rural areas and other cities, boosting economic growth and development. Furthermore, the real estate market provides an important feedback loop to the government's development plan, allowing it to respond to market signals and make informed decisions about the allocation of resources and the development of urban areas, while also serving as a mechanism to discipline the government's efforts in implementing its development plan.

Buying a piece of land in a city is like acquiring a stake in the city's equity, as the value of the land is determined not just by the current payoff provided by the land but also by the expected future payoff. The market's willingness to pay for the land is therefore largely influenced by its expectation of the city's future development. For this reason, it is crucial for the local government to outline an ambitious development plan for the city, which helps to boost the market's valuation of the land. A convincing development plan can help to increase the confidence of the real estate market in the future infrastructure and economy of the city, even if the city currently lacks sufficient infrastructure and a booming economy. This increased confidence can allow the local government to generate a large amount of revenue based on the market's expectation of the city’s future economy, which can then be used to fund the current infrastructure development.

The need for local governments to regularly sell land provides a strong incentive for them to deliver on their development plans. Failure to do so would lead to lower expectations for the future development of the city, resulting in a decreased valuation of the land and reduced revenue from land sales. This incentivizes local governments to implement their development plans efficiently and sustainably. The land sales-based funding model provides an incentive-compatible scheme for local governments to exert efforts to implement their development plans and ensure the city's sustainable and efficient development. Market prices for land and real estate properties also provide valuable information and feedback to the local government regarding their development plan. For example, higher prices for land and properties in one district relative to another district can indicate the relative strength of the development plans for the two districts, enabling the government to adjust its plans accordingly. See Xiong (2023) for more general discussions of how the market may complement the state planning by providing both incentives and information feedback to the government in China’s hybrid economy.

2. Excesses of the Hybrid Model

In addition to the complementarity between the state and the market, the hybrid structure of China's real estate sector exposes it to potential weaknesses in China's hierarchical government system, also known as the Mandarin system. This centralized government structure is characterized by decisions made at the highest levels of the government and passed down to lower levels. As a result, the real estate market in China is heavily influenced by policies and agendas of the central government, as well as the efficiency and incentives of local governments in implementing these policies. Song and Xiong (2023) provide a theoretical model that analyzes how career incentives of local officials within the Mandarin system may impact China's economic growth. This section explores several structural forces within the system that can contribute to the over-reliance of local governments on the real estate sector to finance their investments. This reliance is further compounded by market forces, leading to over-investment and over-leverage in the real estate sector.

A. The financing channel

Land sales are a critical source of fiscal funding for local governments, which are responsible for implementing the central government's economic and social policies. Therefore, the central government's policy agenda can significantly impact the real estate sector through its role as the financing channel of local governments, even if the policies are not directly related to real estate.

The aftermath of the 2008 global financial crisis provides a vivid example of this channel. In response to the crisis, the Chinese government launched an extensive economic stimulus package aimed at boosting growth and stabilizing the economy. The package included measures to increase infrastructure development and investment. While these measures stimulated infrastructure development, local governments primarily financed them through debt financing backed by revenue from future land sales, as they were unable to sell enough land in a short period to fund all the required projects.

Before the crisis, the central government prohibited local governments from using unauthorized debt financing to control the "soft budget constraint" problem. However, to facilitate the large-scale stimulus, the central government relaxed this restriction and allowed local governments to raise debt financing through local government financing vehicles.[2] These companies were established by local governments for the purpose of raising debt financing. Consequently, local governments borrowed trillions of RMB in bank loans, often backed by future land sale revenues. This significant increase in local governments' debt further increased their dependence on land sales for revenue and put pressure on the real estate market to perform well to generate sufficient revenue for debt repayment.

This episode highlights the possibility that to fulfill the central government's policy agenda, local governments may have to resort to not only selling more land but also utilizing land-collateralized leverage. This may result in over-investment and over-leverage in the real estate sector.

B. The tournament channel

Another factor contributing to the over-reliance of local governments on land sales and debt financing collateralized by future land sales is the economic tournament among local officials. This phenomenon refers to the competition among local officials for career advancement and promotion by boosting the local economy and improving infrastructure, as highlighted by Li and Zhou (2005), Zhou (2007), and Fang, Li, and Wu (2023). This competition can lead to a "race to the bottom" in terms of debt financing and dependence on the real estate market, as suggested by Song and Xiong (2023).

To compete with officials from other regions in the central government's performance evaluations, local officials have incentives to use debt financing backed by future land sale revenues to fund short-term infrastructure investments and improve short-term economic

[2] See Bai, Hsieh and Song (2016) for a comprehensive summary of this debt-financed stimulus. Cong et al. (2019), Chen, He and Liu (2020), and Huang, Pagano and Panizza (2020) provide further analysis to show that the debt incurred by local governments during the stimulus crowd out credit from banks to private firms and lead to the large expansion of shadow banking in China.

performance, adding pressure on the real estate market to perform well. Since local governments' ability to repay debt and fund future projects depends on revenue generated from land sales, the economic tournament among local officials can exacerbate the use of debt financing, leading to a cycle of dependence on the real estate market and increasing pressure on it to perform well.

C. The central government guarantee channel

The explicit or implicit guarantees provided by the government for the real estate sector may further exacerbate over-investment and over-leverage in the real estate market. The reliance of local governments on real estate-collateralized debt makes the real estate market systemically important in China. A downturn in the real estate market can have far-reaching consequences, not only for local governments in terms of a fiscal crisis but also for the banking system. According to Liu and Xiong (2020), 25% of banking assets in China are exposed to the real estate market, including loans made to local governments, mortgage loans to home buyers, and business loans to real estate developers. This high level of banks' exposure to the real estate sector highlights the systemic importance of the sector.

In the event of a downturn in real estate prices triggering a systemic banking crisis that significantly impacts the wider economy, there would be strong pressure on the central government to support the real estate market and prevent prices from falling. To this end, the central government has implemented a wide range of counter-cyclical policy measures to mitigate real estate market fluctuations. As Song and Xiong (2018) summarize, when the real estate market is considered overheated, the central government tends to tighten mortgage down payment requirements and raise mortgage interest rates. Conversely, when the real estate market is considered depressed, the central government tends to loosen these measures and may even use monetary policy to provide additional support. However, such interventions may undermine the usefulness of real estate prices as indicators for urban development and local economic performance.[3] Consequently, the systemic importance of the real estate sector can fundamentally alter its role as a mechanism for providing feedback and disciplining local governments.

The government's support for the real estate market, in turn, may encourage not only local governments but also real estate companies, households, and non-real estate firms to seek risk in the real estate market. With guarantees from the central government, local governments

[3] Geng and Pan (2022) offer systematic evidence demonstrating that government support results in a significant premium for debt financing of state firms compared to private firms in China's credit market.

would be more inclined to use real estate-collateralized debt to boost their short-term performance, further exacerbating their soft-budget problem. This could lead to a cycle of over-leverage and risk-taking, undermining the financial stability of the real estate market and the wider economy.

Moreover, recognizing the central government's support, other market participants would also be motivated to seek risk in the real estate sector. For example, real estate companies may become overly aggressive in their investments, taking on excessive leverage to maximize their profits. This can lead to the rapid expansion of companies like Evergrande, which had taken on a significant amount of debt to fund its expansion before its debt crisis. While this strategy may generate short-term gains, it also increases the risk of default, which can have significant consequences for the real estate sector and the broader economy.

In addition, households may also become more willing to take on debt to purchase properties, including investment homes, assuming that the government will protect them from downside risks. This can lead to a speculative frenzy in the real estate market, causing a significant increase in property prices, as analyzed by Chen and Wen (2017) and Chen at al. (2022). Moreover, non-real estate firms may also be incentivized to enter the real estate market, diverting resources from other sectors of the economy. This can create distortions in the allocation of resources, hindering long-term economic growth, as studied by Chen et al. (2017).

Through these distortions together, the state planning and the market may also exacerbate each other, leading to increased risk-taking by market participants in the real estate sector. This, in turn, can lead to excessive leverage and a distortion in the allocation of resources, as the real estate sector becomes the primary focus of investment, diverting resources from other sectors of the economy. These outcomes can have significant long-term implications for economic growth and development.

3. The Real Estate Sector during the Covid Period

In this section, I provide a summary of the market dynamics of the real estate sector, with a focus on the Covid pandemic period in 2020-2022.

A. Land sales

Under the Chinese constitution, land is owned by the state, and local governments are responsible for administering the use of land. Local governments regularly sell land usage rights to the market through a process known as land sales. The duration of these usage rights typically ranges from 30 years for industrial land, which is restricted for use in industrial facilities, to 40 years for commercial land, which is restricted for use in commercial and business facilities, and 70 years for residential land, which is restricted for use in residential development. The revenue from land sales has contributed to about 40% of the fiscal budget of local governments in recent years. See the recent review by Gyourko et al. (2022) of the land-based fiscal finance in China.

Figure 2 provides a summary of the aggregate annual land sales from 2015 to 2022 for residential land, commercial land, and industrial land. Panel A displays the total revenue generated from land sales for the three types of land. Residential land sales account for more than 50% of the total land sale revenue for local governments in each of the years from 2015 to 2022. The revenue from residential land sales steadily increased from 1,047 billion RMB in 2015 to a peak of 3,625 billion RMB in 2020, before dropping to 2,564 billion RMB in 2022. Meanwhile, the revenue from commercial land sales is substantially lower than that of residential land, fluctuating between its lowest value of 631 billion RMB in 2015 and its highest value of 929 billion RMB in 2020. However, during the Covid pandemic period from 2020 to 2022, the revenue from commercial land sales dropped by 29% to 662 billion RMB in 2022. In contrast, the revenue from industrial land sales is the lowest among the three types of land, but has increased steadily from 259 billion RMB in 2015 to 541 billion RMB in 2022. The sharp drops in the revenue generated from residential and commercial land sales during the Covid period of 2020-2022 have contributed to the fiscal distress faced by local governments.

Panel B presents the total quantity of land sales for the three types of land. Even though, industrial land contributes to the lowest revenue among the three types of land, the quantity of industrial land sales is the largest. The quantity of industrial land sales has increased from 105,314 hectares in 2015 to 170,995 hectares in 2022. The quantity of commercial land sales is the lowest among the three and has fluctuated between its lowest value of 24,891 hectares in 2017 and its highest value of 32,394 hectares in 2020. During the Covid period, the quantity of commercial land sales dropped by 26% to 23,963 hectares in 2022. In contrast, the quantity of residential land sales initially increased from 39,512 hectares in 2015 to 65,023 hectares in 2020, but then dropped during the Covid period by 43% to 36,953 hectares in 2022.

Panel C shows the average annual prices for the three types of land, determined by the total revenue divided by the total quantity of each type of land sales. This average land sale price does not control for the difference in quality of land sold in each of the years, and is thus different from a typical land price index. See Wu, Gyourko and Deng (2012) for a widely used land price index for major cities in China. Nevertheless, the average land sale price provides a useful measure of land price change over time. Residential land is the most expensive among the three and experienced the largest price increase in 2015-2022. The average price of residential land increased from 2,649 yuan per square meter in 2015 to 6,939 yuan per square meter in 2022, representing a rise of more than 136%. Interestingly, even since the outbreak of the Covid pandemic in early 2020, the price of residential land has continued to rise, increasing by 27% from 2020 to 2022. This large increase in the average price of residential land sharply contrasts the large drop in the quantity of residential land sales during the Covid period, indicating a potential mismatch between demand and price.[4]

On the other hand, commercial land has been sold at a lower average price than residential land, ranging from 2,114 yuan per square meter in 2015 to a peak of 2,951 yuan per square meter in 2021. After reaching its peak, the price of commercial land remained relatively stable around 2,800 yuan per square meter. Meanwhile, industrial land is sold at much lower prices than residential and commercial land and has experienced a steady price increase trend over the years, with the average price rising from 246 yuan per square meter in 2015 to 316 yuan per square meter in 2022. The substantially lower prices of industrial land reflect the Chinese government's policy of discounting industrial land to subsidizing industrial development, as analyzed by a recent paper of He et al. (2022).

Figure 3 provides a summary of the sales of residential land (the main source of land sale revenue to local governments) across three different tiers of cities: first-tier cities (the four largest metropolitan areas, Beijing, Shanghai, Guangzhou, and Shenzhen), second-tier cities (provincial capital and major cities), and third-tier cities (smaller cities). Panel A shows the revenue from residential land sales. In the pre-Covid period from 2015 to 2020, the revenue from residential land sales has sharply increased for all three tiers of cities. It increased from 135 billion RMB to 354 billion RMB for the four first-tier cities, from 364 billion RMB to 1,268 billion RMB for second-tier cities, and from 548 billion to 2,003 billion for third-tier cities. However, during the Covid period, the revenue from residential land sales dropped for second-tier cities and third-tier cities, while it continued to rise for the four first-tier cities. The drop of 23% in the second-tier cities is substantial, while the drop of 41.5% in the third-tier cities is

[4] In a normal market equilibrium, an increase in price can be associated with a decrease in transaction quantity if there is a supply shortage. However, this may not be the case in China's real estate market during this period, as local governments are short of funding and thus motivated to sell more land.

particularly large and consistent with the stress highlighted by the recent report of Rogoff and Yang (2023). In contrast, the four first-tier cities even had an increase of 18% from 2020 to 2022, indicating strong real estate demand in these cities despite the Covid pandemic.

Panel B shows that the quantity of residential land sales in second-tier and third-tier cities experienced significant increases prior to 2020, followed by substantial drops during the Covid period between 2020 and 2022. Specifically, there was a 42% drop in the quantity of residential land sales for second-tier cities and a 44% drop for third-tier cities during this period. Interestingly, Panel C indicates that from 2020 to 2022, the average land price in second-tier cities experienced a large increase of 33%, while the average land price in third-tier cities also saw a modest increase of 3.9%. This highlights a sharp contrast between the quantity drop and price increase in residential land sales in both second-tier and third-tier cities. This contrast again indicates a potential mismatch between demand and price.

B. Residential properties

Figure 4 presents a summary of residential property transactions in the primary market across the three tiers of cities from 2015 to 2022. Panels A and B illustrate two measures of the quantities of residential property transactions, one by the total area of transacted properties and the other by the number of units. These measures indicate that the majority of residential property transactions occurred in second-tier cities, while the least were in first-tier cities. During the Covid period of 2020-2022, there were significant drops in the quantities of residential property transactions across all three tiers of cities. By the area of transacted properties, the drop was 11% for first-tier cities, 40% for second-tier cities, and 45% for third-tier cities. By the number of transacted units, the drop was 13% for first-tier cities, 42% for second-tier cities, and 45% for third-tier cities.

Panel C displays the total value of residential property transactions, while Panel D shows the average price of the transacted properties measured by the total value divided by the total area of transacted properties. Interestingly, from 2020 to 2022, the total value increased by 9% in first-tier cities despite the 11% drop in the total area of transacted properties, implying that the average price increased by 22%. During the same period, the total value of residential property transactions dropped by 31% in second-tier cities and by 42% in third-tier cities, implying that the average price increased by 16% and 7%, respectively.

There is a consistent trend across the three tiers of cities, where despite a significant decrease in the quantity of residential property transactions during the Covid period of 2020-2022, the average price increased instead of decreasing. This sharp contrast in the quantity drop and price increase further highlights a mismatch between the demand and price of residential properties, which is in line with the previously discussed mismatch in the demand and price of residential land.

To determine if a supply shortage is causing the price increase and transaction quantity decrease, Figure 5 examines the ratio of housing inventory to annual sales. Panel A shows that at the national level, the ratio of inventory to sales has remained stable around 1.1 but increased to 2.1 in 2022. This suggests that it will take 2.1 years to deplete the housing inventory at the current sales rate. Panel B shows that the ratio of inventory to sales increased in 2022 across the three tiers of cities, with the largest increase in third-tier cities and the smallest increase in first-tier cities. This evidence indicates that a supply shortage may not be the cause of the price increase and transaction quantity decrease in the real estate market, as the ratio of housing inventory to sales has significantly increased in 2022.

Figure 6 presents the housing price index provided by the National Bureau of Statistics (NBS) of China for the 70 largest cities, which provides a measure of housing price fluctuations after controlling for the potential change in the quality of transacted properties.[5] Panel A reports the annual price increase (December to December) for primary market transactions, while Panel B reports the annual price increase for secondary market transactions.

According to the NBS housing price index, the primary market transactions in first-tier cities saw a modest price increase of 4.4% and 2.5% in 2021 and 2022 respectively, while second-tier cities experienced a price increase of 2.85% in 2021 and a price drop of -1.14% in 2022. Third-tier cities experienced a price increase of 0.93% in 2021 and a price drop of -3.86% in 2022. In terms of secondary market transactions, first-tier cities experienced a price increase of 5.35% in 2021 and a modest increase of 0.57% in 2022, while second-tier cities saw a price increase of 1.55% in 2021 and a price drop of -3.19% in 2022. Third-tier cities experienced a slight price drop of -0.04% in 2021 and a larger price drop of -4.76% in 2022.

Overall, the quality controls introduced by the NBS housing price index show less price appreciation than the average price of transacted properties in first-tier cities during the Covid

[5] Fang et al. (2016) have constructed a housing price index for 120 cities in China in 2003-2013 by using an extensive dataset of mortgage loans from a state bank. Their index shows substantially large housing appreciation in 2003-2013 than the NBS housing price index, possibly due to different controls used for housing quality.

period of 2020-2022, almost flat prices for second-tier cities, and a modest price drop for third-tier cities.

4. The Risks

With the ongoing difficulties faced by the real estate sector, including many firms such as Evergrande experiencing difficulties in repaying their debt, and imbalances between over-supply of housing and insufficient demand created by the slowdown of the urbanization process and aging population, concerns have arisen regarding the potential crises and risks that could disrupt China's real estate sector. This section discusses the potential risks that may take different forms.

A. Will the bubbly real estate trigger a debt crisis in China?

The bubbly real estate prices and high leverage in China's real estate sector have drawn comparisons to the real estate market in the U.S., which also saw a combination of soaring housing prices and high leverage by subprime households, eventually leading to a full-blown financial crisis. However, it's important to note that the structure of China's real estate sector is different from that of the U.S. in the mid-2000s, making its risks distinct.

Contrary to the U.S. housing boom in the 2000s, which was propelled by a credit expansion to subprime households with minimal equity in their homes, the Chinese authorities have enforced a high down payment requirement, as emphasized by Fang et al. (2016). This substantial equity share offers a useful buffer against a modest decline in housing prices.

According to Bernanke (2018), the chairman of the Federal Reserve Board in 2008 when the crisis initially hit, the US crisis was triggered by a panic run by financial market participants on various money market instruments that were tied to mortgage loans. This type of panic run is similar to runs by depositors on banks. As highlighted by the classic bank run model of Diamond and Dybvig (1983), when some depositors rush to exit by cashing out their deposits, others will also have to cash out, eventually forcing an otherwise healthy bank to fail. The cascading effects may even drag down other healthy financial institutions that either hold claims in the failed bank or assets experiencing fire sales due to the liquidation of the failed bank, leading to a system-wide financial crisis.

It's crucial to recognize that the Chinese government's strong commitment to ensuring financial stability, and its ability to mobilize local governments, state banks, and state-owned enterprises, make a western-style debt crisis less likely in China. During a panic situation, any stakeholder looking to exit would have to pass through the government, which would eventually coordinate all stakeholders to restructure their debt or equity claims to delay or even avoid costly liquidation. The recent experience with Evergrande has clearly demonstrated the government's commitment to this approach. In response to the financial distress faced by Evergrande in paying off some of its maturing debt, the central government privately instructed local governments to sort out Evergrande's financial situation and organized a partial bailout by inviting state-owned real estate firms to buy some of its properties and banks to restructure some of its debt. These measures effectively prevented a potential financial crisis triggered by Evergrande.

The government's past actions have also demonstrated its willingness to organize similar restructuring efforts for other debt-troubled real estate firms. As the real estate market remains critical to China's economy, there is little doubt that the government will intervene again in any future real estate crisis to prevent a financial meltdown.

B. Is there a pending real estate crash?

China's real estate market has experienced substantial growth over the past few decades, as documented by Fang et al. (2016) and Glaeser et al. (2017), with rising home prices and the piling up of housing inventory in the sector, as shown by Figures 4 and 5 in the previous section. However, the sector is facing various structural issues that may impact its future growth and stability. One of these issues is the demographic shift in China. In 2022, the birth rate dropped below the death rate for the first time, leading to a shrinking and aging population. This demographic shift will eventually lead to reduced housing demand in the long run. See Wang and Shen (2022) for a review of China’s demographic change. In addition, China's urbanization process is also slowing down, adding to the reduced asset demand. As of 2022, China's urbanization rate is 65%, which is already close to the 80% level of developed countries. The annual urbanization rate has also slowed down to between 1-1.5% in recent years. As discussed by a recent IMF report of Rogoff and Yang (2022), third-tier cities face even more challenges, with a net negative migration inflow as people are migrating to first- and second-tier cities.

These structural factors have raised concerns about the potential for a real estate crash in China. The slowing down of China's urbanization process and the demographic shift could impact housing demand and put downward pressure on real estate prices. Interestingly, the NBS housing index shown in Figure 5 also indicates a slowing down in the growth of housing prices in 2020-2022, especially in third-tier cities.

Despite the structural factors that are putting downward pressure on China's real estate sector, it is important to note that the government is committed to preventing a potential real estate crash. A real estate crash could lead to significant losses in banks' loan portfolios, resulting in a banking crisis, as well as a crash in local governments' revenue from land sales, leading to a fiscal crisis. The Chinese government has several tools at its disposal to influence the real estate market and support demand, thus mitigating the risk of a real estate crash.

Firstly, the People's Bank of China (PBC) has the authority to control both interest rates and down payment requirements for mortgage loans, which directly affect home buyers' ability to finance their home purchases and thus their housing demand. In the past, the PBC has used measures such as reducing mortgage rates and down payment requirements to support the real estate market, although it has not reduced these requirements during the COVID period.

Secondly, local governments have the power to regulate non-residents' home purchases and residents' second home purchases in their cities. In the past, local governments have often used these restrictions to cool off an overheated housing market. However, in recent years, several cities have reversed some of these restrictions to stimulate housing demand.

Thirdly, in response to the substantial downward pressures on the housing market, over 20 third-tier cities in China have implemented bans on real estate firms selling new homes at prices below certain lower limits in 2022. This type of ban on price drops directly prevents a price crash and thus avoids banks having to mark down their loan portfolios that are heavily exposed to the real estate sector.

The implementation of such bans on price drops confirms the government's commitment to stabilize the real estate market and maintain financial stability amidst mounting risks. However, some critics express concerns that such policies could interfere with the normal functioning of supply and demand dynamics, potentially hindering market efficiency and leading to misallocation of resources. These concerns are valid, as there is a sharp contrast in Figures 2-5 between increasing prices and decreasing transaction volumes in 2020-2022 for both sales of residential land and residential property transactions, indicating a mismatch between real estate prices and demand for residential land and properties.

Finally, some local governments have resorted to selling land to local state-owned enterprises (SOEs) and local government financing vehicles (LGFVs) to maintain revenue from land sales and avoid dropping land prices due to reduced demand. However, this may have led to inflated bid prices for the land purchases by these entities, potentially distorting the market and leading to misallocation of resources.

Taken together, due to China’s hybrid economic structure, the government has a substantial capacity to avoid a hard landing in the real estate sector. By slowing down a real estate crash through a host of administrative orders, the government may be able to buy time to stimulate the economy, which would in turn lead to stronger demand for real estate. However, it is also important to note that some of the measures used by the government to mitigate the real estate crash, such as restrictions on price drops and selling land to local SOEs and LGFVs, may distort the market and hinder efficient resource allocation. This could make it harder for the economy to achieve sustainable long-term growth.

C. Economic growth risk

Although the Chinese government has shown a strong commitment and capacity to postpone a real estate crisis, state intervention may not address the structural challenges faced by the real estate sector. Ultimately, derisking the real estate sector depends on China maintaining its economic growth in the future. If economic growth fails to reach a necessary level, market participants may be unable to sustain high expectations of the real estate market, which are essential for maintaining real estate demand. As highlighted by Fang et al. (2016), the high housing price-to-income ratio observed in Chinese cities is heavily reliant on households' expectations of future economic growth. Conversely, if China can maintain its growth—even a modest growth rate of 4-5%—for the next five years, Chinese cities may gradually outgrow the high housing prices and elevated leverage.

Thus, the path to derisk China's real estate sector is to find new growth engines for the Chinese economy. In recent decades, China's real estate sector has been one of the key drivers of its economic growth, alongside the export and infrastructure sectors. However, the real estate sector is now facing increasing challenges and risks, while the other two engines have also slowed down. The export sector is uncertain due to the global trend away from globalization and tension in China-US relations. Meanwhile, China has already built up a significant amount of infrastructure, especially in the eastern part of the country, reducing the demand for further development. The slowdown in the real estate sector is also limiting local governments' ability to fund new large infrastructure projects. As a result, policymakers must identify new sources of economic growth.

Shifting towards a more consumption-driven economy in China could be a solution to the current economic challenges, but it presents a major challenge in terms of stimulating domestic consumption. One of the key obstacles is the high savings rate among Chinese residents, which could be due to a lack of a strong social safety net and increasing economic uncertainty. These factors can make people hesitant to spend money and increase consumption. To encourage greater domestic consumption, policymakers will need to implement reforms that increase household incomes and improve social protections, such as healthcare and education. Additionally, promoting a more service-oriented economy with higher value-added industries could provide more opportunities for employment and income growth, which in turn can lead to higher levels of consumption. Policymakers may also introduce redistributive policies such as the common prosperity policy to further support the lower tail of the population.

Also note that a real estate downturn can have significant effects on local government fiscal budgets and their ability to stimulate the economy. Local governments heavily rely on land sales revenue, accounting for approximately 40% of their total revenue in recent years.[6] Thus, a slowdown in the real estate market not only creates substantial economic pressure but also limits the fiscal capacity of local governments to stimulate the economy. Policymakers must find a new financing model for local governments that does not rely solely on land sale revenues. Exploring alternative sources of revenue, such as property taxes, may be an option, but may face political resistance from homeowners who view their properties as investments. Introducing property taxes could also put short-term pressure on housing prices and make it even more difficult for local governments to sell land.

D. Policy risk

China's hybrid economy relies heavily on government interventions to stimulate and manage economic growth. While government intervention can help postpone a real estate crash and a full-blown debt crisis, it's important to recognize that excessive government interventions, driven by political or non-economic considerations, may pose significant policy risks to both the real estate sector and the broader economy.

Conceptually, Brunnermeier, Sockin, and Xiong (2022) and Sockin and Xiong (2023) have developed theoretical models that illustrate how intensive government interventions in China's hybrid economy can result in noise in the government's policy-making becoming a critical factor in the macroeconomy and financial markets. This, in turn, diverts market participants' attention from acquiring information about economic fundamentals to information about noise in government policy-making, reducing the information feedback from the market to state planning and making government policy-making even more uncertain.

[6] See Su (2022) for a study that highlights a high fiscal multiplier of spending by local governments in China, funded by land sales, in stimulating economic growth.

As discussed by Huang (2023) and Noughton (2023), in recent years, the Chinese government has begun to pursue other policy agendas in addition to economic growth, such as common prosperity, environmental protection, and better balancing against capitalists. While these agendas are important and well-justified, they may also divert the focus of the hybrid economic system away from economic growth. As explored by Song and Xiong (2023), assigning multiple tasks to local governments not only dilutes the priority of economic growth but also diminishes the efficiency of China's Mandarin system in pursuing any of the policy priorities. This, in turn, makes it even more challenging to maintain a reasonable economic growth rate, thereby exacerbating the pressure on the real estate sector.

Confronting the issue of bubbly housing prices and rising leverage in the real estate sector is a significant challenge for policymakers in China. The popular slogan "Housing for living, not for speculation" has led to the implementation of the three red line policy, aimed at tightening debt financing for real estate companies. While the slogan and policy serve a well-intentioned purpose of promoting housing affordability and ensuring financial stability in the real estate sector, they do not address the underlying structural issues faced by the sector, such as the reliance of local governments on land sales revenue to fund public infrastructure and services, as well as the reduced housing demand due to demographic changes. The timing of this policy is particularly awkward, as many real estate firms are already facing financial difficulties on the eve of a real estate downturn. The tightening of the leverage constraints may have further exacerbated the situation and contributed to the financing difficulties faced by companies like Evergrande.

There is also a concern that the central government's overly ambitious policy agenda may exacerbate the current economic conditions. In the absence of a new growth engine, setting overly ambitious growth targets can create pressure on local officials to restart the failing engine by relying on land sales or land financing to fund large-scale infrastructure projects, even when the real estate market requires time to slowly absorb its current inventory. This approach can increase leverage and debt levels for both local governments and real estate developers, further stressing an already vulnerable real estate sector.

5. Conclusion

China's real estate sector currently faces great challenges, such as high housing prices, elevated leverage, and increasing inventory. These challenges stem from the country's hybrid economic structure, which combines market mechanisms with extensive state interventions.

Specifically, local governments' heavy reliance on land sales for funding public spending creates an environment where real estate becomes too important to fail, which in turn encourages over-investment and over-leverage in the sector. Despite the mounting pressure on real estate, the government maintains a strong commitment and the ability to delay a crisis. Ultimately, derisking real estate in China depends on the nation's economic growth. Sustaining an adequate growth rate will allow Chinese cities to outgrow high housing prices and elevated leverage.

While an imminent real estate crisis appears unlikely at this point, the extensive state interventions in China's hybrid economy also expose the real estate sector and the economy to significant policy risks. In particular, the government's strong commitment to maintaining financial stability essentially binds all boats together to weather a storm. However, this strategy also exposes the entire system to an unforeseen fire that could burn all boats simultaneously. In other words, if a shock were to ultimately trigger an economic collapse within the Chinese economy, the real estate sector might amplify the shock and collapse along with the economy.

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Figure 2: Land Sales in 2015-2022

This figure reports revenue, quantity and price of land sales from the CREIS database of China Index Academy, which collects data from local land transaction centers and the China Land Market website (www.landchina.com). The data used in this figure covers over 2300 cities and counties across China in 2015-2022.

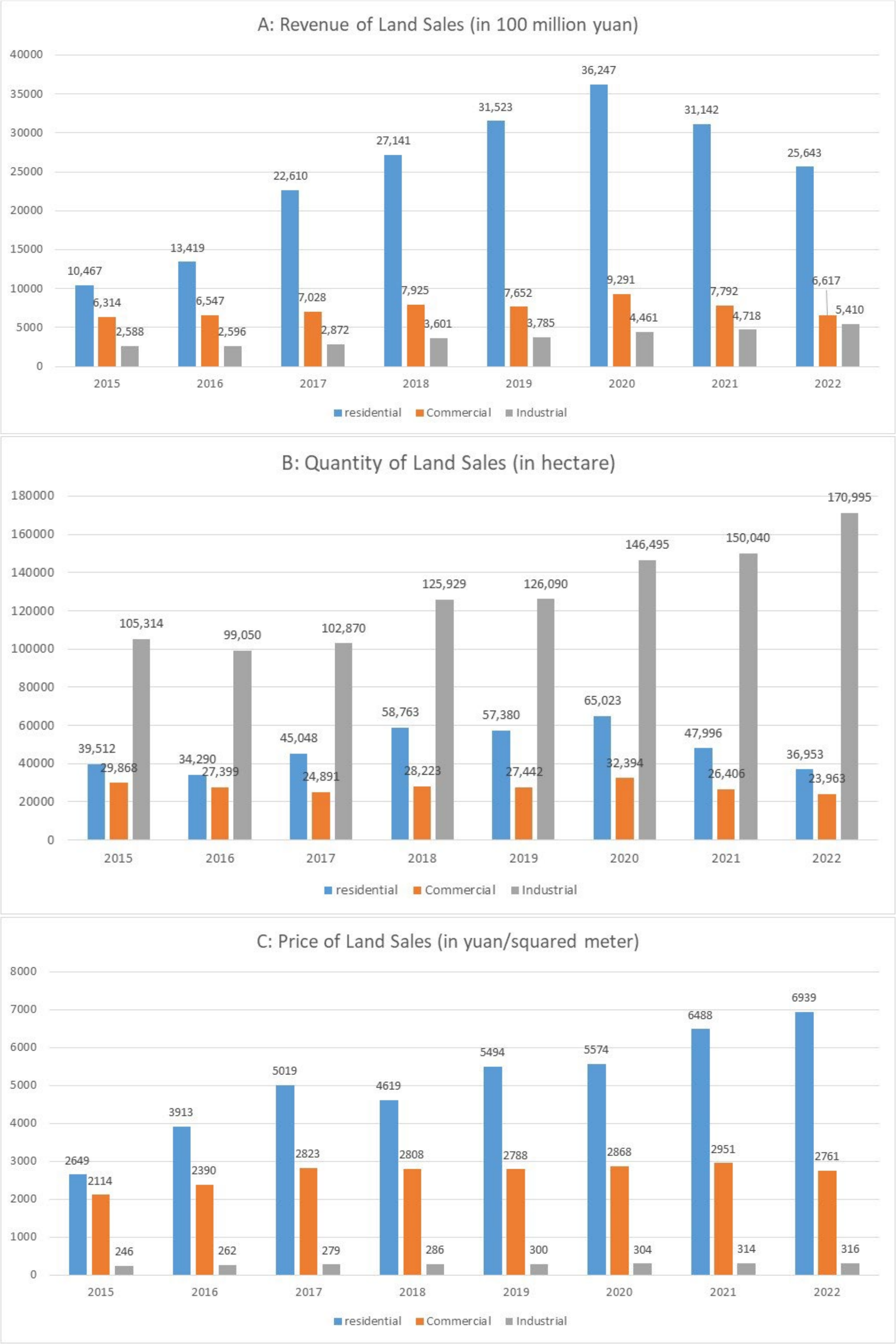
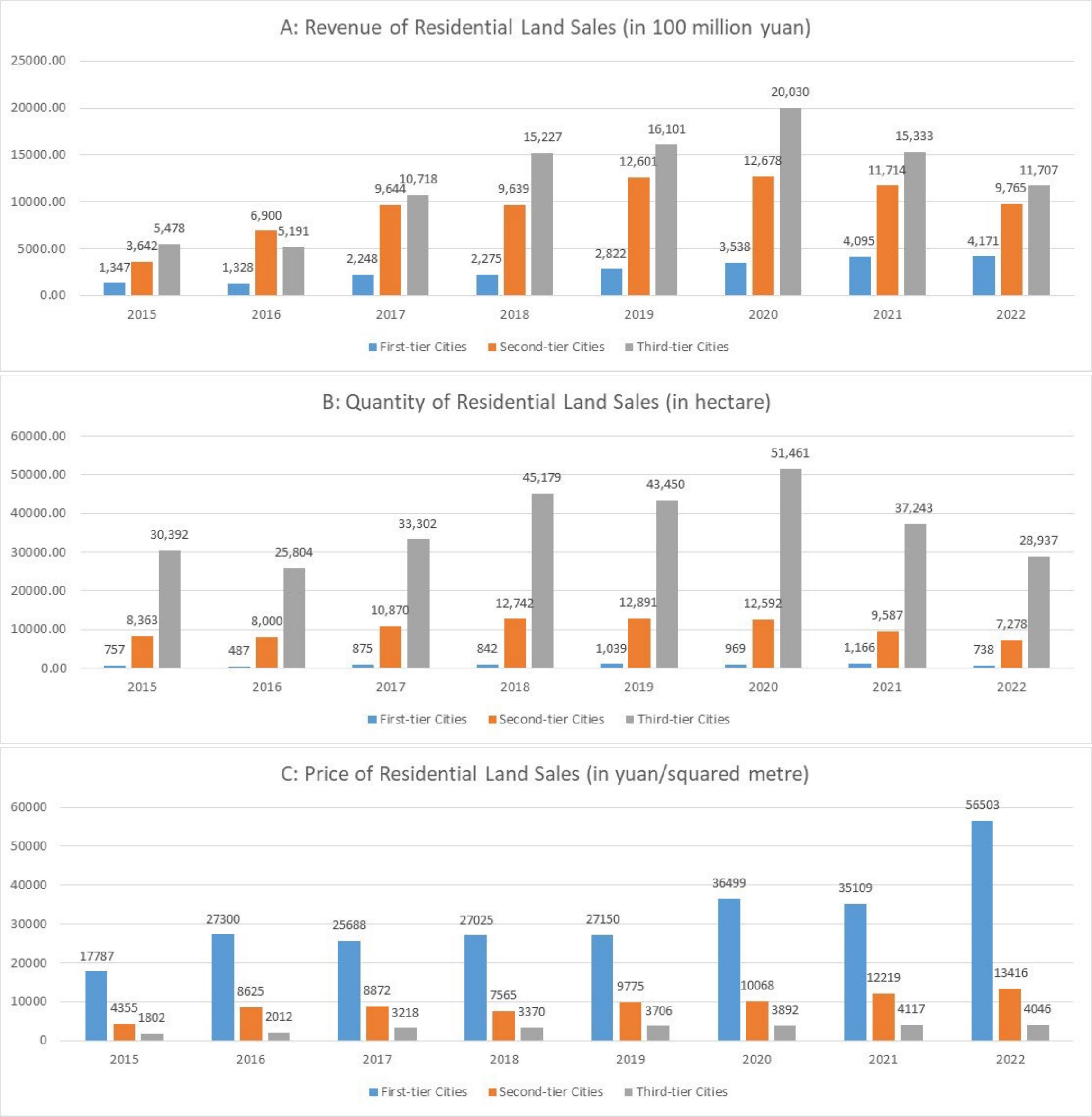


Figure 3: Residential Land Sales in Three Tiers of Cities in 2015-2022

This figure reports revenue, quantity and price of land sales from the CREIS database of China Index Academy, which collects data from local land transaction centers and the China Land Market website (www.landchina.com). The data covers 355 cities across China in 2015-2022. First-tier cities include 4 cities: Beijing, Shanghai, Guangzhou, Shenzhen. Second-tier cities include 35 cities: Tianjin, Chongqing, Hangzhou, Nanjing, Wuhan, Chengdu, Suzhou, Dalian, Xiamen, Xi'an, Changsha, Ningbo, Wuxi, Fuzhou, Shenyang, Qingdao, Jinan, Nanchang, Hefei, Zhengzhou, Taiyuan, Shijiazhuang, Changchun, Harbin, Hohhot, Haikou, Nanning, Lanzhou, Kunming, Guiyang, Xining, Yinchuan, Urumqi, Wenzhou, Sanya. Third-tier cities include the remaining 316 cities covered by the dataset, which are sometimes further classified as third- and fourth-tier cities in other reports.



A: Revenue of Residential Land Sales (in 100 million yuan)

B: Quantity of Residential Land Sales (in hectare)

C: Price of Residential Land Sales (in yuan/squared metre)

Figure 4: Residential Property Transactions across Three Tiers of Cities in 2015-2022

This figure reports residential property transactions in the primary market from the CRIC database, which collects information from the Housing Management Bureau. The plots are based on 4 first-tier cities, 29 second-tier cities, and 36 third-tier cities, which do not have any missing data in 2015-2022. The first-tier cities include Beijing, Shanghai, Guangzhou and Shenzhen. The second-tier cities include Dalian, Fuzhou, Guiyang, Jinan, Kunming, Lanzhou, Nanchang, Nanning, Xiamen, Shenyang, Changchun, Wenzhou, Wuxi, Haikou, Xining, Sanya, Chengdu, Hangzhou, Hefei, Nanjing, Ningbo, Qingdao, Suzhou, Tianjin, Wuhan, Xian, Changsha, Zhengzhou, and Chongqing. The third-tier cities include Changzhou, Huizhou, Nantong, Quanzhou, Xuzhou, Yantai, Zhongshan, Zhuhai, Dongying, Hengyang, Huaian, Jiujiang, Langfang, Liuzhou, Luoyang, Qingyuan, Shantou, Shaoguan, Taizhou, Wuhu, Yancheng, Yueyang, Zhangzhou, Zhaoqing, Zhenjiang, Zibo, Jiangyin, Jinjiang, Kunshan, Taicang, Yixing, Guan, Xianghe, Yanjiao, Dongguan, and Foshan.

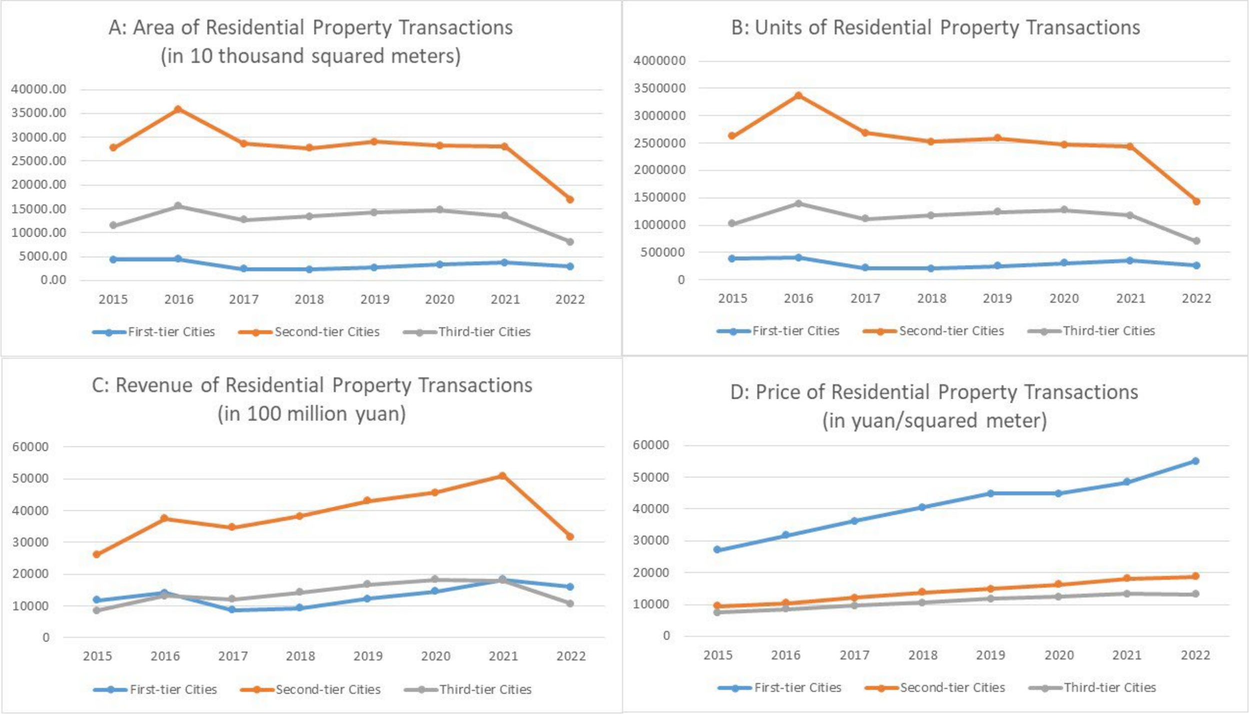


Figure 5: Ratio of Inventory to Annual Sales in 2015-2022

This figure reports inventory of residential properties in the primary market from the CREIS database. The data cover 172 cities, including the 4 first-tier cities and 35 second-tier cities defined in Figure 3, as well as 146 other cities. Due to missing data, the figure uses available cities for each of the years in 2015-2022.

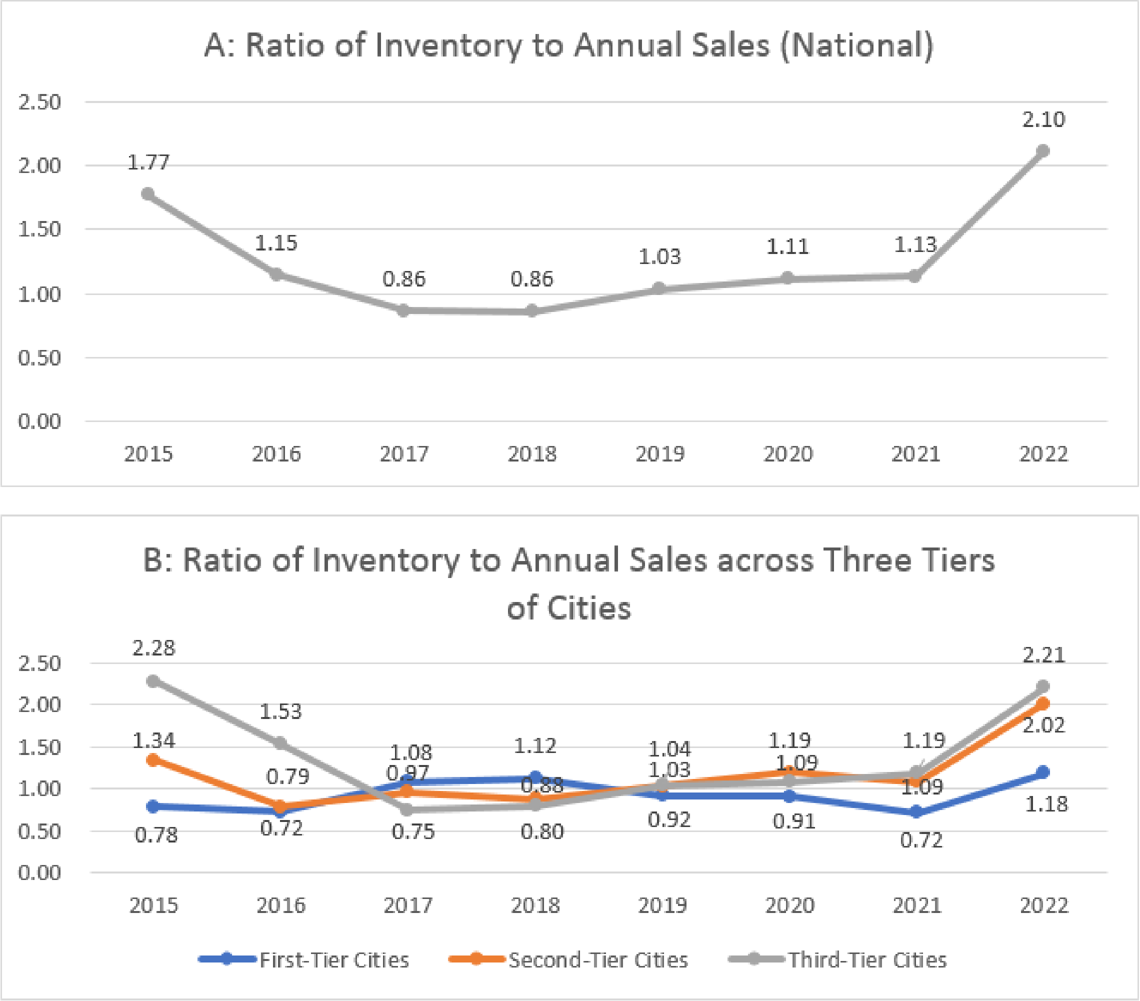
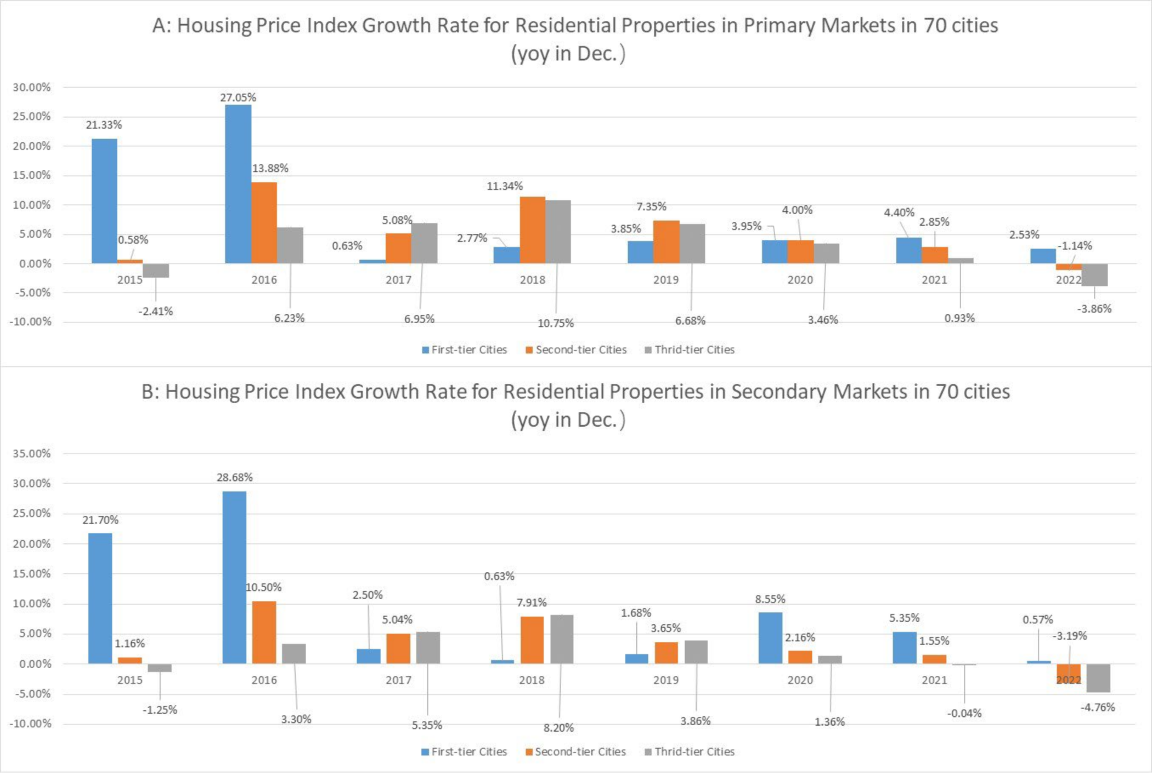


Figure 6: Housing Price Index Growth Rate

This figure covers the Housing Price Index provided by the National Bureau of Statistics of China for 70 major cities. First-tier cities include Beijing, Shanghai, Guangzhou, Shenzhen. Second-tier cities include 31 cities: Tianjin, Shijiazhuang, Taiyuan, Hohhot, Shenyang, Dalian, Changchun, Harbin, Nanjing, Hangzhou, Ningbo, Hefei, Fuzhou, Xiamen, Nanchang, Jinan, Qingdao, Zhengzhou, Wuhan, Changsha, Nanning, Haikou, Chongqing, Chengdu, Guiyang, Kunming, Xi'an, Lanzhou, Xining, Yinchuan, Urumqi. Third-tier cities include 35 cities: Tangshan, Qinhuangdao, Baotou, Dandong, Jinzhou, Jilin, Mudanjiang, Wuxi, Xuzhou, Yangzhou, Wenzhou, Jinhua, Bengbu, Anqing, Quanzhou, Jiujiang, Ganzhou, Yantai, Jining, Luoyang, Pingdingshan, Yichang, Xiangyang, Yueyang, Changde, Shaoguan, Zhanjiang, Huizhou, Guilin, Beihai, Sanya, Luzhou, Nanchong, Zunyi, Dali.



A: Housing Price Index Growth Rate for Residential Properties in Primary Markets in 70 cities (yoy in Dec.)

B: Housing Price Index Growth Rate for Residential Properties in Secondary Markets in 70 cities (yoy in Dec.)