

Is the effect of drop limit order policy of the real estate industry in Yue yang city in line with expectations—Empirical analysis based on difference in difference

Yi Lyu *

bachelor of applied economics Avenida Padre Tomás Pereira Taipa, Macau 999078 China

Abstract. In recent years, the spread of covid-19 has led to a decline in residential consumption levels and a decrease in demand in the housing market. In order to maintain, some housing enterprises started to reduce prices significantly, this move destroyed the market law, and the local government set up the policy of limit drop order in order to restrict the malicious price reduction without following the market law, and it is not known whether the policy of limit drop order can promote the development of the real estate industry while limiting the malicious downgrade, according to the general rule, through the regulation of the real estate market should help the development of the real estate industry, this paper through This paper analyses Yue yang City, the first city to implement the drop restriction policy, through the double difference method. The results show that the drop restriction policy has a certain suppressive effect on the local real estate industry in the short term, while the impact on the market in the long term is yet to be studied.

1 Introduction

With the spread of the covid-19 and the adjustment of the macroeconomic system, China's real estate industry has been hit by a number of shocks. The value added index of China's real estate industry in 2020 (100 for the previous year) is 101.3, i.e. a 1.3% rise in real estate GDP for the year 2020, which is much lower than the inflation rate (measured by the CPI index) of 3.3% for that year. The outbreak forced people to stop work and school, and even with the timely government subsidy policy, people's consumption levels inevitably dropped. Whereas China follows a socialist market economy system where prices are determined by supply and demand, a fall in consumption levels means a leftward shift in the demand curve [1], a downward shift in the equilibrium point and a fall in the equilibrium price. And this economic principle is mapped to the reality is that real estate enterprises in order to sell houses to carry out including but not limited to price reduction, send furniture, cashback and other means, and in order to govern the various chaos of the real estate market, the local governments have also introduced a series of systems [2].

In August 2021, with the "Notice on Price Restrictions on New Commodity Housing Net Transactions in the Real Estate Market" issued by the Housing and Urban-Rural Development Bureau of Yueyang City, the implementation of Drop Limit Order Policy was marked, stipulating that the transaction price of new houses could not be lower than 85% of the record price, while various cities such as Heze, Kunming, Tangshan and Yangzhou also introduced Drop Limit Order Policy one after another in the following months.

Since the Central Economic Work Conference at the end of 2016, the concept of "houses are for living and not for speculation" was put forward, marking the beginning of the central government's consolidation of the real estate industry, and the introduction of the Drop Limit Order Policy is an extension of its concept, i.e. not to affect housing prices due to speculative psychology. And later, at the end of October 2020, the "Proposal of the Central Committee of the Communist Party of China on Formulating the 14th Five-Year Plan for National Economic and Social Development and the 2035 Visionary Goals" stated that "promoting the balanced development of finance and real estate and the real economy" was the implementation of this concept.

In order to regulate the real estate industry, the central and local governments have introduced a series of systems, among which the more famous ones, such as land talks and purchase restrictions, have been subject to a great deal of research by previous authors, while the Drop Limit Order Policy, as a relatively new system, is still in a research gap. The Drop Limit Order Policy must be effective in its aim of preventing abnormal falls in house prices as it delineates hard and fast criteria for falls, but the impact on the real estate sector is still unknown.

I therefore hope to conduct a regression analysis of Yueyang's real estate data through difference in difference to empirically demonstrate the impact of the Drop Limit Order Policy on the local real estate industry. And I hope to find different conclusions from the previous research to promote the development of the theory.

* Corresponding author: 15027885178@163.com

2 Literature Review

Liu Fang (2021) measured the level of housing market bubble by constructing a model, and verified from the research results that there is a serious bubble in China's first-tier cities, and there are also bubbles of different degrees in second, third and fourth-tier cities, but the level of bubble in individual second and third-tier cities is higher than that in first-tier cities, however, his conclusion that there is no obvious housing price bubble in China in recent years is obviously in conflict with the results of previous people's research, and it is worth discussing in depth[3]. And Chen Lujia and Jiang Weiwei (2016) have obtained similar findings before theirs, arguing that the level of bubbles in second- and third-tier cities in China is higher than that in first-tier cities [4].

Whereas abnormal rises and abnormal falls herald the inflation and bursting of bubbles, Shan Keqiang (2016) analyses real estate price bubbles from the perspective of risk logic, arguing that the movement of bubbles can intensify the division of social classes, thereby triggering political and financial risks, and may even lead to financial crises [5].

Through the previous research results, we have learned that there is a bubble in the housing market in China, and the abnormal decline in house prices will lead to changes in speculators' expectations which will further lead to a fall in house prices, and eventually the real estate market will collapse like an avalanche, leading to a concentration of bankruptcy of housing enterprises, a large number of loans from banks becoming bad debts, and in the case of banks facing bankruptcy they will definitely stop granting loans and calling in loan projects already granted, while enterprises in the real economy facing no loan funds will also be affected and close down, eventually spreading to the whole social level [6].

3 Model building and data processing

3.1. Difference-in-difference

Difference-in-difference (DID) is a widely used method for policy evaluation. The basic principle is to introduce dummy variables, divide the experimental group into an experimental group and a control group[7], where the experimental group implements a policy and the control group does not, and conduct a regression analysis of the panel data before and after the implementation of both policies. Generally the control group and the experimental group will have a difference a on a measure before the policy is imposed, and this difference is the difference between the two groups of data, and after the policy is imposed, the two groups of data will increase or decrease by a difference b on a measure on top of the difference a , which is the net effect of this policy. [8] The DID is widely used because of its treatment of the endogeneity problem. The double difference method can be applied on the premise that the parallel trend assumption is satisfied, i.e. the two groups of data have the same trend of change before the policy is imposed, i.e. the only difference between the two groups of data is that the experimental

group is affected by the policy while the control group is not, thus avoiding the endogeneity problem of the study to a certain extent. The model is set up as follows:

$$AMO_{it} = \beta_0 + \beta_1 did_{it} + \gamma X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

In equation (1), the subscript $i(=1,2)$ is the city and $t(=1,2,\dots,36)$ is a total of 36 months from August 2019 to July 2022. The explanatory variable AMO_{it} is the amount of real estate transactions in city i in month t ; did_{it} is a policy dummy variable, if city i has implemented a fall restriction order in month t , then did_{it} takes the value of 1 in month t and months after t , otherwise it is 0; X_{it} is a series of control variables, μ_i is an individual fixed effect, λ_t is a time fixed effect, ε_{it} is the sum of residual terms, representing randomness shocks; γ is the regression coefficient of the control variables, β_0 is the constant term, β_1 is the core parameter of the assessment policy, if the fall restriction order can promote the development of the local real estate industry while suppressing housing price reduction, then the coefficient β_1 should be positive.

3.2 Description of sample selection

The purpose of this study is to assess the impact of the fall restriction system on the real estate sector in Yueyang City, which is the city of Yueyang, and its counterpart, Yantai, which is the city of Yantai. Yantai was chosen because Yueyang and Yantai are both third-tier cities, and although there are some differences in resource endowments, infrastructure, institutional environment and economic development levels between the two cities, the real estate data of both cities have shown the same downward trend since the outbreak of the covid-19. And it is fully consistent with the assumption of parallel trends in the DID, allowing its two cities to be compared under the model. The reason for selecting data from 2019 onwards is to exclude the impact of the covid-19.

3.3 Variable handling

Explained variables. The explanatory variable in this study is the amount of local real estate transactions ($lgAMO$), which aims to assess the impact of the fall restriction policy on the real estate sector while limiting the fall in house prices.

Core explanatory variables. The core explanatory variable in this study is a dummy variable for the system of Drop Limit Order Policy, denoted by did . If a city has a Drop Limit Order Policy in place in the current month, then did takes on a value of 1 for that month and subsequent months, otherwise it takes on a value of 0.

Control variables. With reference to previous studies, three variables are examined to control for the influence of other factors on the amount of real estate transactions. (i) the industrialisation level of the city (ind), which is represented in this paper by the proportion of the local gross domestic product of the secondary industry to the local GDP; (ii) population density (pop), which is represented in this paper by using the ratio of the number of people in the city to the area of the city, i.e. the population living on a unit area; (iii) the Loan Prime Rate

(LPR), which is selected from the national interbank The market quoted interest rate for loans of 5 years and above authorised by the Interbank Offered Rate Centre published by the People's Bank of China.

Table 1. Variable names and processing methods.

Variable type	Variable names	processing methods
Explained variable	Amount Sold (lgAMO)	Logarithmic value of real estate transaction amounts
Core explanatory variable	policy dummy variable (did)	(0, 1)
controlled variables	the industrialisation level of the city (IND)	Total local secondary sector production as a share of local GDP
	population density (POP)	Ratio of population size to land area
	the Loan Prime Rate (LPR)	Loan Prime Rate issued by the National Interbank Offered Rate Centre

3.4 Data source description and descriptive statistics

The real estate data selected for this study was obtained from the China Real Estate Index System (CREIS), the city data was obtained from publicly available data on the local government website, and the bank data was obtained from publicly available data on the official website of the People's Bank of China. Of the GDP internal structure data, Yantai only publishes quarterly data and the latest data is only up to the first quarter of 2021 at the time of writing, while Wuhan only publishes annual data on the share of secondary industry, so the quarterly and annual data are used to represent the corresponding monthly data respectively. Descriptive statistics are presented for the main variables. See Table 2.

Table 2. descriptive statistic.

Variables	N	mean	sd	min	max
AMO	72	1.245	0.344	0.00860	1.800
ind	49	0.413	0.0137	0.389	0.464
pop	72	0.0427	0.00866	0.0339	0.0515
Lpr	72	0.0466	0.000967	0.0445	0.0485

3.5 Parallel Trend Test

The use of model (1) above is premised on the assumption of parallel trends, i.e. the two sets of data have similar trends before the policy is imposed, based on the data

before and after the policy is imposed in the two cities as shown in Figure 1:

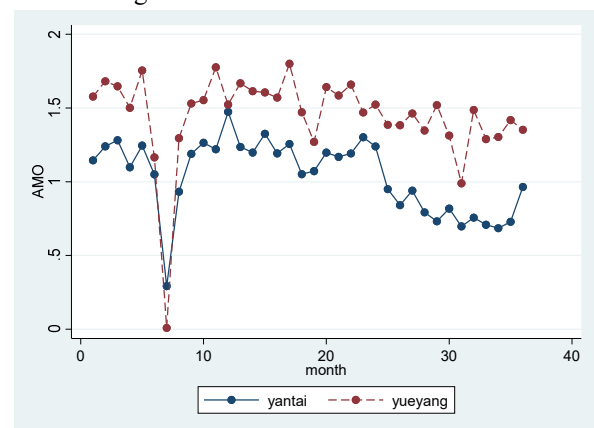


Fig. 1. Caption of the Figure 1. Below the figure.

The Drop Limit Order Policy in Yueyang City started in August 2021, the 24th month of the selected data, and it can be seen that the amount of housing transactions in both cities showed a similar trend until month 24, with no significant difference between the two groups, and the parallel trend hypothesis is valid.

4 Analysis and test of empirical results

4.1 The impact of the Drop Limit Order Policy on the real estate industry

Through the regression results of the model, as shown in Table 3, the coefficient of the dummy variable did is negative and significant at the 1% level, indicating that the Drop Limit Order Policy has inhibited the development of the local real estate industry in limiting the fall of local house prices.

Table 3. The regression result of the model.

VARIABLES	AMO
did	-0.417*** (0.0445)
ind	8.920*** (2.458)
pop	13.92*** (1.175)
Lpr	-69.73 (45.22)
Constant	0.323 (1.163)
Observations	49
Number of code	2

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In the era of the rampant covid-19 and the shutdown of production in China to prevent the epidemic, the level of consumption of residents has dropped, resulting in a

lack of demand for housing, while according to the market economy of supply and demand, the supply side, i.e. real estate developers, should appropriately reduce the price of housing transactions to ensure the volume of transactions, so that the amount of transactions will not drop significantly and stabilise their own profit and loss. In contrast, the system of fall restriction orders restricts the extent of price reduction by real estate developers, which will inhibit the development of real estate enterprises in the short term. However, the purpose of the system is not to promote the development of the real estate industry, but to regulate the real estate enterprises in order to sell housing and do not follow the laws of the market reckless price reduction, the limit of 15% also shows that is to regulate the phenomenon of reckless price reduction, in line with the market supply and demand of appropriate price reduction, is worth advocating, but only for the interests of real estate enterprises to destroy the market and even the risk of bursting the bubble behavior, is definitely to stop. However, it is important to discourage the act of destroying the market or even risking bursting the bubble just for the sake of real estate enterprises' own interests.

Although the short-term data shows that the fall restriction is a disincentive to the development of the real estate industry, in the long run, it is actually beneficial to the healthy development of the real estate market

4.2 robustness tests

To further test the robustness of the regression results of model (1), this study conducted robustness tests by changing the variable indicators.

Table 4. Regression results of robustness test.

VARIABLES	AMO
did	-0.327*** (0.102)
gdp	-0.00156 (0.00120)
pop	47.51** (24.06)
Lpr	-35.92 (41.53)
Constant	1.734 (1.775)
Observations	72
Number of code	2

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

By replacing the industrialisation level indicator with GDP instead of the share of secondary industry to measure the industrialisation level of a city, the regression analysis was again conducted and the regression results

were still significant, as shown in Table 4, indicating the robustness of the findings of the text.

5 Conclusion

This paper examines the dampening effect of the Drop Limit Order Policy on the local real estate industry through DID model, and verifies the robustness of the empirical results by replacing the indicators with those of Yueyang and Yantai cities. The study shows that the Drop Limit Order Policy also restricts the development of the local real estate industry while limiting the fall in house prices. However, it is necessary to regulate the real estate market through the Drop Limit Order Policy to stop the indiscriminate price reduction of real estate enterprises at source and effectively prevent the bursting of the real estate bubble.

However, in the future we should aim to find policies that can both adjust property prices macroscopically and promote the development of the real estate industry, such as subsidies and tax breaks for real estate enterprises, and a series of housing purchase incentives for young people who have not yet purchased a property, etc. We can even start from the real estate industry chain and provide incentives to upstream or downstream enterprises to adjust the costs of real estate enterprises in a disguised manner and thus adjust property prices laterally [9].

As the Drop Limit Order Policy has only been in place for one year at the time of writing, the short-term data does not show the impact of the real estate market consolidation, and due to data limitations, only one city with a fall restriction system has been studied in this paper, and the results cannot be used as a general rule. Future research will need to look at other cities that have introduced restriction orders, to find out the general pattern of the impact of the Drop Limit Order Policy on the local real estate industry, or to study the real estate market data for the next three or five years to find out the long-term impact of the Drop Limit Order Policy on the real estate industry through consolidation of the real estate market.

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