Research Project

The Impact of House Price Bubbles and House Prices on Common Prosperity

——An empirical test based on China's provincial panel data

BY

Wei Yukuo
2030001098
Applied Economics

Li Xinran
2030001051
Applied Economics

Group #: 11

Submitted to

Dr. Gangzhi FAN

Beijing Normal University - Hong Kong Baptist University United International College

December 11th，2023

Catalogue

Abstract 1

1. Introduction 1

2. Literature Review 3

2.1 Researches on Housing Price Bubble Measurement 3

2.2 Researches on the Measurement of Common Prosperity 3

2.3 On the Studies of House Prices on Common Prosperity 4

2.4 Studies of the Impact of Housing Price Bubbles on Common Prosperity 5

3. Theoretical Analysis and Research Hypothesis 5

4. Data 6

4.1 Data Specification 6

4.2 Variable Selection 6

4.3 Descriptive Statistics of the Variables 7

4.4 Construction of the Evaluation Index System for Common Prosperity 8

4.5 House Price Bubble Measurement Method and Indicators 8

4.6 Construction of the Empirical Model 9

5. Empirical Analysis 10

5.1 Housing Price Bubble and the Impact of Housing Prices on Common Prosperity (Appendix1) 11

5.2 Robustness Test(Appendix 2) 11

5.3 Endogeneity Test 13

5.4 Heterogeneity Test（Appendix3） 17

6. Conclusion 18

References 20

Appendix 23

Abstract

Under the background of economic transition, this study analyzes the influencing factors and the corresponding influencing mechanism of common prosperity from the point of real estate bubble. The results show that house price bubbles inhibit the rise in the level of common prosperity. Heterogeneity analysis shows that housing price bubbles inhibit common prosperity more significantly in cities with smaller economies. In view of this, in order to attain this goal, it is vital to get rid of the "wealth illusion" brought by the housing price bubble, adhere to the policy orientation of "housing not speculation," improve the regulation mechanism based on city policies, curb the housing price bubble, and prevent the excessive financialization of real estate.

Keywords: House Price Bubble, Common Prosperity, Housing Market, Housing Price

1. Introduction

Real estate industry is a crucial fundamental domain in a country. Since 2000, China's real estate market has entered a new boom cycle. With the per capita GDP exceeding $1,000 in 2003, China's economy officially entered a stage of rapid development. At the same time, the price of commercial housing has also entered a channel of rapid rise. The same is true for the formation and inflation of housing price bubbles.

From the point of economic growth, the added value of China's real estate industry will be 7.38 trillion yuan by 2022, contributing 6.1% to GDP in that year. From the perspective of wealth distribution, the proportion of real estate in the composition of household wealth remains high. The contribution of property to wealth growth declined in the fourth quarter of 2022, but remained above 60 percent, according to the Annual Report on China's Household Wealth Index released by Southwestern University of Finance and Economics. The specific asset structure with a high proportion of real estate wealth makes Chinese household wealth more affected by the fluctuation of housing price and more sensitive to the change of housing price bubble.

In previous studies, domestic scholars generally analyzed and studied the impact of the financial market from the perspective of real estate bubble. With the inflated house purchase and the demand for house purchase against the market, the real estate bubble appeared, but these behaviors in the market actually harmed the justice of social wealth distribution, and hindered the achievement of the goal of common prosperity of the society.

The study here focuses on the influence of housing price and housing price bubble on common prosperity. Studying the impact of housing price bubble on common prosperity is helpful to clarify the major issue of whether we can rely on the development of real estate industry to achieve common prosperity in the long term from the perspective of asset bubbles. If not, how to treat the relationship between housing price bubble and wealth distribution, and what factors should be paid attention to when regulating housing price in the process of economic and social development for the purpose of realizing common prosperity. Thus, it provides a basis for further optimizing the combination of real estate regulation policies.

This paper mainly analyzes the real estate bubble through the panel data of 31 provincial-level administrative regions in the 20 years from 2000 to 2020, so as to more clearly and significantly analyze the development direction of common prosperity in China. This is a special feature and a great contribution that no existing research has. Among them, the common degree measures and analyzes the income difference between urban and rural residents and the level of urbanization, while the affluence degree focuses on the per capita disposable income and consumption expenditure of residents, and uses Engel coefficient and Gini coefficient to measure the results, which makes the results more convincing. Common prosperity is the result of the combination of the two forces, requiring the coordination and common development of common degree and affluence, and continuous promotion. Moreover, this paper not only makes a detailed measurement and analysis of the level of housing price bubble and the degree of common prosperity respectively, but also explores their combined influence.

2. Literature Review

2.1 Researches on the Measurement of Common Prosperity

The idea of common prosperity originated in 1953, when farmers were expected to live a life of common prosperity and general prosperity (Kakwani et al., 2022). With the development of the national economy and social progress, common prosperity has been given new definitions at different stages, and has been constantly improved with China's modernization as the development goal (Yang et al., 2023). And on this road, a series of disparities and differentiation between the rich and the poor appear, so that the government needs to take measures and introduce policies to restrain. In this day and age, the common prosperity we want is prosperity for all, not prosperity for a few (Limei, 2022).

At present, the measurement is mainly at the provincial level. The measurement methods include taking income as the core indicator and examining its discrete characteristics (Houkai et al., 2022), and build comprehensive indicators based on the connotation of common prosperity, such as development, equality, sharing and sustainability (Jiang, 2023).

In terms of the usability of provincial data, some researchers construct a common prosperity evaluation index system with 3 first-level indexes, 10 second-level indexes and 21 third-level indicators from the three aspects of development, sharing and sustainability of common prosperity (Han et al,. 2021). According to this method, and in order to avoid the problems of overlapping data of multiple indicators and missing indicators, this paper chooses to use the entropy method to empower the common prosperity evaluation index and obtain the common prosperity development index of provinces, respectively.

2.2 Researches on Housing Price Bubble Measurement

Price bubbles can lead to financial crises, and there are many such episodes in history. When the growth rate of house prices has fully exceeded the use value of houses, the house price bubble begins to form and inflate rapidly. After the subprime mortgage crisis in the United States, scholars at home and abroad paid closer attention to the measurement of

housing price bubbles (AKKUŞ, 2021). The first is the measurement method of housing price bubble based on partial equilibrium model (Aizenman et al., 2019). The second category is the housing price bubble identification method based on unit root test, among which Phillips proposed the unit root right ADF test method (SADF) and the unit root right ADF test method (BSADF) combined with the forward (back) moving window recursive technique are the most representative (Sahoo, 2019).

Jianglin et al. (2010) used the ratio of house price to income to measure the urban housing price bubble, based on the average consumption tendency of urban residents, the level of mortgage interest rate and the dominance of mortgage loans, deducing that the reasonable upper limit of the ratio of house price to income that urban residents can afford is about 4.38-6.78 times. In recent years, there are bubbles in the urban housing market in China, some cities have great bubbles, and some first-tier cities have amazing bubbles, which contain huge financial risks.

2.3 On the Studies of House Prices on Common Prosperity

Bangura & Lee, (2019) believes that high housing prices will have a wealth effect on households with housing assets, that is, rich families are more likely to own property than poor families, leading to wealth concentration and further widening the gap between the rich and the poor. Kaplan et al.(2020) also found that rising housing prices would lead to faster income growth of the upper class, further aggravating the gap between the rich and the poor. In addition, some scholars believe that the widening gap between disparate income groups will in turn strengthen the preference for housing demand and continue to push up the housing market price, forming a vicious cycle (Justiniano et al., 2019).

However, with the continuous change of real estate policies, there is a trend of tightening year by year, and some scholars believe that the impact of housing price on common prosperity tends to be positive.

2.4 Studies of the Impact of Housing Price Bubbles on Common Prosperity

As an important asset bubble, the emergence, expansion and collapse of housing price bubble have a huge impact on the distribution of economic wealth and income, and its impact on common prosperity is mainly centered on the impact of material prosperity on economic growth (Anthony, 2019).

In this regard, scholars hold different views. Stroebel et al. (2019) believes that housing price bubble is conducive to economic growth, and the fluctuation of real estate investment is conducive to GDP growth. According to the endogenous growth theory, Diamond et al.(2019) believe the housing price bubble will cause the economy to fall into a long-term depression. From the perspective of enterprise labor cost, Knoll et al. (2017) concludes that housing price bubble has a negative impact on economic growth. Some scholars also believe that the relationship between the two is dynamic.

In general, considerable research results have been obtained on both the housing bubble and common prosperity, but there is still room for further research on the relationship between them.

3. Theoretical Analysis and Research Hypothesis

From the perspective of common degree, the inflated housing price will form a bubble, which is not conducive to the reduction of the gap between various income groups. First, inflated housing prices widen the wealth gap between homeowners and non-homeowners by increasing their asset values. Some studies show that residents who own real estate take advantage of their existing wealth to earn rent and invest, thus further widening the gap between the rich and the poor. However, in recent years, with the introduction of relevant policies, the housing price has also been tightening year by year with the change of policies, which has a more active effect on common prosperity. Secondly, the housing price bubble will deepen the dependence of government fiscal revenue on land through the high-price transaction of land, which is not conducive to balanced development.

In terms of affluence, pushing up housing prices can boost the development of property-related industries during economic downturns. In addition, some studies have shown that inflation is associated with the housing price bubble, which will increase the living cost of residents and make them have to increase their income to meet their living needs.

Based on the analysis of the impact of real estate bubble and housing price on commonality and affluence, the research hypothesis of this paper is put forward:

H1: The expansion of housing price bubbles will inhibit the improvement of common prosperity

H2: The rise in housing price will promote the level of common prosperity

4. Data

4.1 Data Specification

In this paper, the data of 31 provinces in China from 2000 to 2021 are selected to measure the level of common prosperity, the degree of the housing price bubble and housing prices, and we build the panel data model to analyze the influence mechanism of housing price bubble and housing price on common prosperity. The data of this paper are derived from the China Statistical Yearbook, China Real Estate Statistical Yearbook, China Population Census, and statistical yearbooks of various provinces (autonomous regions and municipalities directly under the Central Government). Some of the missing values in the data were supplemented with linear interpolation, and data for indicators with large orders of magnitude were logarithmically processed.

4.2 Variable Selection

Table 1 Variable-definition

Type of Variable	Variable Name	Variable Meaning	Computational Method
			Common Degree and Affluence

Dependent Variable	CP	Common Prosperity	Coordinate Coupling Scores (Han et al., 2022)
Independent Variable	Bubble	Bubble of Real Estate Price	Housing Price-to-Income Ratio （Lv, 2010）
	HP	Housing Price	Average House Price Ln (ten thousand yuan)
Controlled Variable	ES	Economics of Scale	Provincial Per Capita GDP Ln
	UR	Urbanization Rate	Urban Population / Total Population
	GFS	Degree of Government Financial Support	Share of Government Expenditure in GDP
Policy Variable	PCP	Housing Price Control Policy Variables	Overall Housing Price Control Policy from the Tight for 1, Loose for 0 (Ding et al., 2015)

4.3 Descriptive Statistics of the Variables

Descriptive statistics for the main variables are shown in Table 2. According to the descriptive statistics, the average value of the common prosperity index of 682 samples was 0.374, and the standard deviation was 0.148, indicating that there is still much room for improvement in the overall level of common prosperity of 31 provinces. Considering the housing price bubble data of 31 sample provinces, it can be seen that the mean value is 6.379, and the standard deviation is 2.435, indicating that the price bubble has appeared in the real estate market in some provinces on the whole. The degree of housing price bubble varies significantly between different provinces.

Table 2 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
CP	682	.3740998	.1480796	.0492848	.9023473
Bubble	682	6.379445	2.434734	1.954283	17.38224
HP	682	46.49318	45.91175	3.535459	325.209
ES	682	10.17034	.8652926	7.922624	12.14167
UR	682	.5089996	.1617778	.1389	.896
GFS	682	.2436741	.1817486	.0691256	1.353777
PCP	682	.5909091	.4920269	0	1

4.4 Construction of the Evaluation Index System for Common Prosperity

Common prosperity has rich connotations of equality, sharing, material wealth and spiritual wealth, and is a complete system composed of two subsystems of commonness and affluence interacting and coordinating with each other (Guo et al., 2023). This paper uses the coupled coordination model to measure the level of common prosperity (Zhang, 2022). The specific indicators are shown in Table 3. The process of calculating the indicators is as follows: first, select the corresponding data of 31 provinces in China, and calculate the common and affluence subsystem scores by the entropy method; second, assign a weight of 50 per cent to each of the two subsystems, and calculate the common prosperity scores by using the coupled coordination model.

Table 3 Index System for Common Prosperity

（Follow Han et al., 2021）

Level 1 Indicators	Level 2 Indicators	Level 3 Indicators	Indicator Attributes
Expansibility	Common Degree Subsystem	Gink Coefficient	-
		Income Double Difference Between Urban and Rural Residents	-
		Urbanization Rate（%）	+
	Affluence Subsystem	Per Capita Disposable Income (yuan / person)	+
		Per Capita Consumption Expenditure of Residents (yuan / person)	+
		Engel Coefficient	-

Note: In the index attribute, "+" indicates that the influence of the index on common prosperity is positive, and "-" means that the influence of the index on common prosperity is negative.

4.5 House Price Bubble Measurement Method and Indicators

In this paper, we use the housing price-to-income ratio to measure the level of housing market bubbles in China by combining the annual data of 31 provinces in China from 2000 to

2021 (Lv, 2010). The China Statistical Yearbook published by the National Bureau of Statistics (NBS) measures the annual per capita disposable income of urban households in each province, and the average household size in each province through the population census, and we multiply the two to get the average annual disposable income of urban households in each province; the NBS also measures the average sales price of commercial residences per square metre in each province. From the population census, we can get the per capita residential area, through the per capita residential area, the average sales price per square metre of commercial residential property, the average household size, multiply the three, we can get the average value of the price of urban housing units in each province; divided by the two averages, we can get the housing price-to-income ratio.

4.6 Construction of the Empirical Model

To test hypotheses H1 and H2, we ran fixed effects and random effects models, respectively, and used the Hausman test results to determine the model used.

Figure 1 Fixed Effect Model

Fixed-effects (within) regression — Number of obs = 682
Group variable: ID — Number of groups = 31

R-sq:
within = 0.6176
between = 0.8288
overall = 0.6670

Obs per group:
min = 22
avg = 22.0
max = 22

F(5,646) = 208.66
corr(u_i, Xb) = 0.1881 — Prob > F = 0.0000

CP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Bubble	-.0091965	.0037379	-2.46	0.014	-.0165363	-.0018567
HP	.0014926	.0001916	7.79	0.000	.0011165	.0018688
ES	.0646907	.0103555	6.25	0.000	.0443561	.0850252
UR	.1113285	.0467351	2.38	0.018	.0195575	.2030996
GFS	-.0165519	.060848	-0.27	0.786	-.1360356	.1029319
_cons	-.3471882	.0868403	-4.00	0.000	-.5177116	-.1766648
sigma_u	.03453662					
sigma_e	.08075507					
rho	.15462189	(fraction of variance due to u_i)				

F test that all u_i=0: F(30, 646) = 2.46 — Prob > F = 0.0000

Figure 2 Random Effect Model

Random-effects GLS regression — Number of obs = 682
Group variable: ID — Number of groups = 31

R-sq:
within = 0.6139
between = 0.8857
overall = 0.6848

Obs per group:
min = 22
avg = 22.0
max = 22

Wald chi2(5) = 1291.03
corr(u_i, X) = 0 (assumed) — Prob > chi2 = 0.0000

CP	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Bubble	-.0052468	.0027715	-1.89	0.058	-.0106789	.0001853
HP	.0011788	.0001604	7.35	0.000	.0008644	.0014932
ES	.0658864	.0083525	7.89	0.000	.0495158	.082257
UR	.2012779	.0388042	5.19	0.000	.1252231	.2773326
GFS	-.0555192	.0246149	-2.26	0.024	-.1037634	-.0072749
_cons	-.4062413	.0704591	-5.77	0.000	-.5443387	-.268144
sigma_u	.01640166					
sigma_e	.08075507					
rho	.03961691	(fraction of variance due to u_i)				

Figure 3 Hausam Test

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Bubble	-.0091965	-.0052468	-.0039497	.002508
HP	.0014926	.0011788	.0003139	.0001047
ES	.0646907	.0658864	-.0011957	.0061215
UR	.1113285	.2012779	-.0899493	.0260463
GFS	-.0165519	-.0555192	.0389673	.055647

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 20.11
Prob>chi2 = 0.0012

According to the test results, the chi2 statistic is 20.11, corresponding to a p-value of 0.0012, much less than 0.05, indicating systematic differences in the coefficients of the fixed and random effect models. Therefore, we reject the null hypothesis that the coefficients of the random effect model are consistent and choose a fixed effect model.

After confirming that the fixed effects model controls for individual fixed effects, the specific model is as follows:

$$CP_{i,t}=\alpha_0+\alpha_1 Bubble_{i,t}+\alpha_2 HP_{i,t}+\Sigma\beta_i X_{i,t}+\delta_i+\varepsilon_{i,t} \quad (1)$$

The explained variable $CP_{i,t}$ represents the common prosperity degree of province i in t year; the core explanatory variable $BUBBLE_{i,t}$ represents the house price bubble level in province i in the t year; the explanatory variable $HP_{i,t}$ represents the house price of province i in the t year; the vector $X_{i,t}$ represents a series of control variables that may affect the common prosperity. Referring to the existing literature (Guo et al., 2023), local financial support degree, economic scale and urbanization rate are selected as control variables in the model; δ_i is individual fixed effect, $\varepsilon_{i,t}$ is random disturbance term, and α_0 is constant term.

5. Empirical Analysis

5.1 Housing Price Bubble and the Impact of Housing Prices on Common Prosperity (Appendix1)

According to model (1), the housing price bubble and the impact of housing prices on common prosperity and its related indicators are shown in Table 4. Among them, the estimated coefficient of the housing price bubble is significantly negative at the 5% significance level, meaning that, on the whole, the housing price bubble significantly suppresses the improvement of the level of common prosperity and the research hypothesis H1 is established. The estimated coefficient of the housing price is significantly positive at the significance level of 1%, indicating that the housing price promotes the level of common prosperity. The research hypothesis H2 is true. In addition, among the control variables, the expansion of economic scale and the improvement of urbanization rate are conducive to realizing common prosperity, while the impact of government financial support on common prosperity is insignificant.

Table 4 Bubbles and the Impact of Housing Prices on Common Prosperity

VARIABLES	(1) CP
Bubble	-0.00920**
	(0.00374)
HP	0.00149***
	(0.000192)
ES	0.0647***
	(0.0104)
UR	0.111**
	(0.0467)
GFS	-0.0166
	(0.0608)
Constant	-0.347***
	(0.0868)
Observations	682
Number of ID	31
R-squared	0.618

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.2 Robustness Test(Appendix 2)

To verify the robustness of the conclusion that the housing price bubble and house prices significantly affect the level of common prosperity, we successively added the control

variables and removed the municipality sample.

First, the number of control variables was successively increased. Based on no control variables in column (1), ES, UR, and GFS were added for regression. The results are shown in Table 5, columns (2), (3), and (4), and the coefficient of the housing price bubble is still significantly negative, which verifies the robustness of the benchmark regression results and indicates that the continuous expansion of the housing price bubble will significantly inhibit the realization of common prosperity. The coefficient of housing prices is significantly positive, meaning that the constant increase will help promote common prosperity.

Second, excluding the sample of municipalities in the benchmark regression (Beijing, Shanghai, Tianjin, and Chongqing) and controlling for individual effects, house price bubbles, house prices, and common prosperity measures are regressed and analyzed, and the results, as shown in column (5) of Table 5, remain robust.

Table 5 Robustness Test

	(1)	(2)	(3)	(4)	(5)
VARIABLES	CP	CP	CP	CP	CP
Bubble	-0.0135***	-0.00961***	-0.00942**	-0.00920**	-0.0126***
	(0.00397)	(0.00366)	(0.00365)	(0.00374)	(0.00415)
HP	0.00281***	0.00156***	0.00151***	0.00149***	0.00130***
	(0.000156)	(0.000182)	(0.000183)	(0.000192)	(0.000239)
ES		0.0745***	0.0630***	0.0647***	0.0759***
		(0.00672)	(0.00817)	(0.0104)	(0.0121)
UR			0.113**	0.111**	0.0919
			(0.0461)	(0.0467)	(0.0666)
GFS				-0.0166	-0.0394
				(0.0608)	(0.0623)
Constant	0.330***	-0.395***	-0.334***	-0.347***	-0.423***
	(0.0200)	(0.0679)	(0.0720)	(0.0868)	(0.0976)

Observations	682	682	682	682	594
R-squared	0.541	0.614	0.618	0.618	0.584
Number of ID	31	31	31	31	27

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.3 Endogeneity Test

There may be endogeneity problems in the original model: first, China's real estate market has gone through many policy controls, and the problem of omitted variables may arise if relevant policy factors are not taken into account while considering the impact of house price bubbles and house prices on the common prosperity; second, an increase in the level of the common prosperity may also have a reverse effect on house price bubbles and house prices; and third, the current period's common prosperity level may be affected by the previous period's common prosperity level, omitting critical explanatory variables in the model. To improve the credibility of the empirical results and mitigate possible endogeneity problems, the following endogeneity tests are conducted: first, descriptive analysis is used to determine the overall policy orientation of real estate policy in a given year (Ding et al., 2015), and real estate policy variables are constructed and added to the regression model. From 2000 to 2021, the variable takes 1 if the policy orientation of the corresponding year is tight and 0 if the policy orientation is loose. The main real estate regulatory measures and the overall orientation during the sample period are shown in Table 6. After adding the policy variables, the regression results are shown in column (1) of Table 7. From the regression results, it can be seen that after controlling for the real estate regulatory policies, the inflation of the house price bubble still significantly inhibits the increase in the degree of common prosperity, and the increase in house prices significantly contributes to the rise in the degree of common prosperity. This shows that the regression results are robust.

Table 6 Main Measures and Overall Orientation of China's Real Estate Policy from 2000 to 2021—Follow Ding et al.（2015）and Guo et al. (2023)

Year	Main Regulatory Measures	Overall Policy Orientation
2000	Tax exemptions for individuals and banks on housing fund loans; reduced tax rates on income from leasing	Loose
2001	Absorption of vacant properties, tax and fee waiver policy	Loose
2002	Reducing the interest rates for Housing Provident Fund deposits and loans	Loose
2003	The People's Bank of China Document No. 121 increased the downpayment ratio; Document No. 18 of the State Council called for continued credit support for qualified property development enterprises and real estate projects	Loose
2004	Transfer restriction on term housing; increase in interest rates and reserve requirement ratios	Tight
2005	Article 8 of the State Council; CBRC Document No. 212 Tightens REITs	Tight
2006	Article 6 of the State Council; Ministry of Construction's Foreign Investment Restriction Order No. 171; Ministry of Construction's Document No. 108 enforcing the collection of individual income tax on the transfer of second-hand properties	Tight
2007	Increase in interest rates and reserve requirement ratio; increase in downpayment ratio and lending rate for second home loans	Tight
2008	Interest rates, credit policy	Loose
2009	Interest rates, tax policy	Loose
2010	Article 11 of the State Council, restriction of purchase	Tight
2011	Circular of the General Office of the State Council on Effectively Stabilising Housing Prices, issued in January 2011	Tight
2012	Continuation of the previous year's regulatory policy	Tight
	The State Council executive meeting in February 2013 identified five policy	

2013	measures to strengthen the regulation and control of the property market	Tight
2014	The People's Bank of China and the China Banking Regulatory Commission (CBRC) issued the Circular on Further Improving the Work of Housing Financial Services, relaxing mortgage policies closely related to homeownership demand	Loose
2015	Continuation of the previous year's regulatory policy	Loose
2016	More cities restarted purchase and lending restrictions in the second half of 2016	Tight
2017	Increase the interest rate on home purchase loans, restrict the purchase, loan and sale of superimposed to promote the tightening of the auction, cultivate the development of the housing rental market, and adhere to the "housing without speculation" tone	Tight
2018	Adopting city-specific policies, promoting a balance between supply and demand, lowering the target for shanty reform, pushing forward legislation on property tax, and resolutely curbing the rise in property prices	Tight
2019	The Central Economic Work Conference reiterated measures based on urban policies, stabilising land prices, house prices and expectations, and the Ministry of Housing and Construction and four other departments jointly issued the Opinions on Further Regulating the Development of Public Rental Housing	Tight
2020	As a result of the new Crown Pneumonia outbreak, the first half of 2020 will see an increase in the number of loose local control policies, followed by a smooth transition to "loose-tight" in the second half of the year	Loose
	January 2021, the real estate loan	

2021	concentration management system for banking financial institutions was formally implemented (Wang, 2021)	Tight

Second, we incorporate the lagged period common prosperity indicator into the model in the presence of house price control policies to examine whether the degree of common prosperity in the previous period affects the level of common prosperity in the current period, and at the same time, we add the lagged period house price bubbles and house prices as instrumental variables into the model, and regress them by using the systematic GMM method, with a view to solving the problems of reciprocal causation and omission of variables.

The results are shown in column (2) of Table 7. The expansion of the house price bubble always has a significant dampening effect on the increase in the level of common prosperity; the increase in house prices has a significant contributing effect on the increase in the level of common prosperity; and the level of common prosperity in the previous period has a dampening effect on the level of common prosperity in the current period. This suggests that the high level of common prosperity in the previous period may have been caused by short-term policy effects, and that the level of common prosperity is likely to fall when these policy effects subside; as the level of common prosperity rises, it becomes more difficult to raise it further, leading to a slowdown or decline in the rate of growth.

It is difficult to judge from the results of the table the specific impact of the loosening or tightening of the current house price control policy on the common prosperity, the possible reason is that the policy control has the characteristic of camera choice, in the process of realising the common prosperity, it is necessary to comprehensively apply different policy combinations according to the actual situation in order to achieve the milestones of the goal, and the optimal house price control policy is not set in stone.

Table 7 Endogeneity Test

	(1)	（2）
VARIABLES	CP	CP
Bubble	-0.0141***	-0.011*
	(0.00394)	(-2.312)

HP	0.00276***	0.004**
	(0.000155)	(5.602)
L1.CP		-0.645*
		(-2.501)
PCP	0.0235***	-0.015
	(0.00698)	(-1.265)
Constant	0.322***	0.274**
	(0.0200)	(4.648)
Observations	682	682
Number of ID	31	31
R-squared	0.549	0.297

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.4 Heterogeneity Test（Appendix3）

The impact of house price bubbles on common prosperity may show differences with the economic environment of each province. In this paper, we take the median of the GDP deflator-treated GDP averages of the 31 provinces in 2000-2021 as the critical value for classifying the size of the economy, and divide the sample into two groups, one with a larger economy and one with a smaller economy. The results obtained after re-regression are shown in columns (1) and (2) of Table 8. For provinces with larger economies, the role of inflated house price bubbles in inhibiting the increase in the level of common prosperity is small and insignificant, while for provinces with smaller economies, the expansion of house price bubbles significantly impedes the realisation of common prosperity. For house prices, on the other hand, growth in both larger and smaller economies contributes significantly to common prosperity. Reasons for this may include: rising house prices increase the wealth of property owners, improving their spending power and quality of life; and the growth in the value of property as an asset provides returns to investors, thus contributing to economic growth and social welfare. In addition, rising house prices may increase local government revenues, such as property taxes, which in turn can be used for public services and welfare, contributing to common prosperity.

Table 8 Heterogeneity Test

	(1)	(2)
VARIABLES	CP	CP
Bubble	-0.00808	-0.0103*
	(0.00500)	(0.00622)
HP	0.00171***	0.00122***
	(0.000234)	(0.000399)
ES	0.0425**	0.0743***
	(0.0176)	(0.0150)
UR	0.0840	0.225***
	(0.0588)	(0.0808)
GFS	0.101	-0.0598
	(0.260)	(0.0677)
Constant	-0.141	-0.469***
	(0.145)	(0.125)
Observations	330	352
Number of ID	15	16
R-squared	0.655	0.587

Standard errors in parentheses

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

6. Conclusion

With the panel data of 31 provincial administrative regions, this paper analyzes the impact of housing price bubble on China's common prosperity from the point of real estate development, and makes an empirical analysis. The results show that: first, the continuous expansion of housing price bubble will inhibit the improvement of common prosperity; Second, rising house prices promote the development of common prosperity. However, the impact of housing price is conditional. If the rise of housing price is accompanied by irrational speculation in the real estate market, it may lead to bubbles, which may have a destabilizing effect on the economy in the long run. The actual effect depends on the sustainability of housing price growth, the fairness of income distribution, and the government's macro-control policies. While accelerating the accumulation of social wealth, the inflation of housing price bubble will further widen the wealth gap between different income groups.

The implications of the above conclusions are as follows: the government and residents should not expect to rely on the bubble formed by the housing price rise for a long time to drive the increase of residents' wealth, and should get rid of the "wealth illusion" caused by the housing price bubble; Economic scale and urbanization have a significant role in promoting common prosperity, while the government's financial support does not have a vital impact on common prosperity. On the premise of adhering to the principle of "housing not speculation," differentiated regulation measures should be taken according to the characteristics of cities with different economic scales and development levels, so as to promote the steady development of house property markets in different types of cities, effectively curb housing price bubbles, and create a livable urban environment.

However, the dataset of this study only covers the scope of 31 provinces from 2000-2021, and more granular city data is needed to analyse the impact of house price bubbles and house prices on common prosperity among different cities therein. In the empirical evidence, we have taken fixed effects and controlled for individuals and not time, if we want to explore the factors that affect individuals but change over time, we need to further fix the time effect, which is suitable for controlling the homogeneous effects of external macroeconomic policies or other global events on individuals to explore the impact of house price bubbles and house prices on the common prosperity in the macro and long term perspective. In addition, since we refer to Lv (2010) to measure the house price bubble by using the house price to income ratio, we need data on the average house price and average household income in each province, but in the process of data collection, we did not find data on the average house price measured directly, so we measure the average house price by multiplying the per capita residential area, the average household size, and the average price of the residence per square metre, which has a certain degree of error, which also affects the results of the regression test. Future research should refine the measurement of average house price values and control for individual fixed effects and time fixed effects to broaden the knowledge of house price bubbles and the impact of house price data on common prosperity across provinces and cities, and to provide more in-depth knowledge to the government, banks and real estate practitioners.

References

AKKUŞ, H. T. (2021). HOUSING PRICE BUBBLES AND FACTORS AFFECTING THE FORMATION OF BUBBLES: THE TURKISH CASE. *Pamukkale University Journal of Social Sciences Institute.* https://doi.org/10.30794/pausbed.835374

Ahmed, R., Jawaid, S. T., & Khalil, S. (2021). Bubble Detection in Housing Market: Evidence From a Developing Country. *SAGE Open, 11*(2), 215824402110066. https://doi.org/10.1177/21582440211006690

Aizenman, J., Jinjarak, Y., & Zheng, H. (2019). Housing Bubbles, Economic Growth, and Institutions. *Open Economies Review, 30*(4), 655–674. https://doi.org/10.1007/s11079-019-09535-9

Anthony, J. (2018). Economic Prosperity and Housing Affordability in the United States: Lessons from the Booming 1990s. *Housing Policy Debate, 28*(3), 325–341. https://doi.org/10.1080/10511482.2017.1393689

Bangura, M., & Lee, C. L. (2019). House price diffusion of housing submarkets in Greater Sydney. *Housing Studies*, 1–32. https://doi.org/10.1080/02673037.2019.1648772

Bourassa, S. C., Hoesli, M., & Oikarinen, E. (2016). Measuring House Price Bubbles. *Real Estate Economics, 47*(2). https://doi.org/10.1111/1540-6229.12154

Diamond, R., & McQuade, T. (2019). Who Wants Affordable Housing in Their Backyard? An Equilibrium Analysis of Low-Income Property Development. *Journal of Political Economy, 127*(3), 1063–1117. https://doi.org/10.1086/701354

Digital Economy, Financial Inclusion and Inclusive Growth - ProQuest. (n.d.). Www.proquest.com. https://www.proquest.com/openview/abbe647cd549b27f2a5822b17821e497/1?pq-origsite=gscholar&cbl=1806366

Ding, J., Li, Z., & Zheng, J. (2015). The Continuity and Effectiveness of Real Estate Control Policies - Based on the Perspective of Credit Resource Reallocation. *Economic Commentary*, *04*, 96–108. https://link.cnki.net/doi/10.19361/j.er.2015.04.008

Guo, W., Luo, B., Lin, X., & Lai, X. (2023). Is the house price bubble a “stumbling block” on the road to common prosperity? --An empirical test based on 90 large and medium-sized cities in China. *Southern Finance*, *04*, 3–18.

https://kns.cnki.net/kcms2/article/abstract?v=SDjqx_HoHgvzhVoWXS5fWE3ZXPWbz5ctFeqZe5ltM8aZw_iueDIVPREBiCPwgK9fsgBGxy6Z-0sSLDqGCsKBf2ot7viB5kGuXWEUiKtrmI2wEXf9yV1VVKNHk7Y7e_tAkmG0VrQuT8A=&uniplatform=NZKPT&language=CHS

Han, L., Peng, Y., & Meng, Q. (2022). Digital Financial Inclusion, Entrepreneurial Activity and Common Wealth - An Empirical Study Based on China's Interprovincial Panel Data. *Soft Sciences*, *03*, 18–24. https://kns.cnki.net/kcms2/article/abstract?v=SDjqx_HoHgs6aqCmVfqY_Bc3J-F01PQLCfJax4olr5neux9prcJTEJm-Ms_9moHAUf6pQqtUR8Btb6fh0BBQZ0uQX1PF6c6jAnqulMc98MCbjyl6bQbjEfJh7htbsHoBhZZa_zBlp_s=&uniplatform=NZKPT&language=CHS

Houkai, W., Kai, C., & Yu, W. (2022). Goal Evolution and Promotion Strategies of Rural Revitalization in the View of Common Prosperity. *63 China Economist, 17*(4). https://doi.org/10.19602/j.chinaeconomist.2022.07.03

Jiang, J. (n.d.). *Common Prosperity: A Pathway to Inclusive Financial Development in China's New Era.* https://doi.org/10.53469/jissr.2022.09(07).02

Justiniano, A., Primiceri, G. E., & Tambalotti, A. (2019). Credit Supply and the Housing Boom. *Journal of Political Economy, 127*(3), 1317–1350. https://doi.org/10.1086/701440

Kakwani, N., Wang, X., Xue, N., & Zhan, P. (2022). Growth and Common Prosperity in China. *China & World Economy, 30*(1), 28–57. https://doi.org/10.1111/cwe.12401

Kaplan, G., Mitman, K., & Violante, G. L. (2020). The Housing Boom and Bust: Model Meets Evidence. *Journal of Political Economy, 128*(9), 3285–3345. https://doi.org/10.1086/708816

Knoll, K., Schularick, M., & Steger, T. (2017). No Price Like Home: Global House Prices, 1870–2012. *American Economic Review, 107*(2), 331–353. https://doi.org/10.1257/aer.20150501

Limei, Z. (2022). The Realization of Common Prosperity through Relative Poverty Alleviation: Gradient Development and Optimization. *Contemporary Social Sciences, 2022*(5). https://doi.org/10.19873/j.cnki.2096-0212.2022.05.001

Lv, J. (2010). Measurement of the bubble level in China's urban housing market. *Economic Research*, *06*, 28–41. https://kns.cnki.net/kcms2/article/abstract?v=SDjqx_HoHguxIe1sVHR5QBUpkT_IfrCgQZs_

uZGMEbMv2pG2mAjv9fnRzPVRM6ZeNudwzmEpY3oOZaaZ6MmFCGmSTnowPiQFV7aWZnyG3ioMtpZet0Mx1xGHwW_IGpu3&uniplatform=NZKPT&language=CHS

Sahoo, M. (2020). House price bubbles and its predictive capacity on inflation and economic growth: Some Indian evidence. *Journal of Public Affairs.* https://doi.org/10.1002/pa.2464

Stroebel, J., & Vavra, J. (2019). House Prices, Local Demand, and Retail Prices. *Journal of Political Economy, 127*(3), 1391–1436. https://doi.org/10.1086/701422

Wang, P. (2021). Some thoughts on the implementation of a real estate loan concentration management system. *China Real Estate*, *28*, 30–35. https://kns.cnki.net/kcms2/article/abstract?v=SDjqx_HoHgtcpuy-vjbQgbgLfUz0gVSU6sODaEMSzR0ozvpwmwdHQtPFj6mJY1vevCUiP3MKWjTIZiSPfeCXOQixzw3a3lBv1jKcSBhnRVWyG0X9Zs0WPk_Sfpa5NHv_YX9zS9CbBnw=&uniplatform=NZKPT&language=CHS

Yang, X., Li, Q., Luo, S., & Li, Q. (2023). How Does Labor Mobility Affect Common Prosperity?—An Empirical Study Based on a Panel of Chinese Cities. *Sustainability, 15*(8), 6893. https://doi.org/10.3390/su15086893

Zhang, J., Dong, X., & Li, J. (2022). Can Digital Financial Inclusion Advance Common Wealth? -Empirical study based on micro household data. *Financial Research*, *07*, 4–17. https://link.cnki.net/doi/10.16538/j.cnki.jfe.20220316.101

Appendix

Appendix1: Bubbles and the Impact of Housing Prices on Common Prosperity

```
Fixed-effects (within) regression               Number of obs      =       682
Group variable: ID                              Number of groups   =        31

R-sq:                                           Obs per group:
     within  = 0.6176                                         min =        22
     between = 0.8288                                         avg =      22.0
     overall = 0.6670                                         max =        22

                                                F(5,646)           =    208.66
corr(u_i, Xb)  = 0.1881                         Prob > F           =    0.0000
```

CP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Bubble	-.0091965	.0037379	-2.46	0.014	-.0165363	-.0018567
HP	.0014926	.0001916	7.79	0.000	.0011165	.0018688
ES	.0646907	.0103555	6.25	0.000	.0443561	.0850252
UR	.1113285	.0467351	2.38	0.018	.0195575	.2030996
GFS	-.0165519	.060848	-0.27	0.786	-.1360356	.1029319
_cons	-.3471882	.0868403	-4.00	0.000	-.5177116	-.1766648
sigma_u	.03453662					
sigma_e	.08075507					
rho	.15462189	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(30, 646) = 2.46                     Prob > F = 0.0000
```

Appendix2: Robustness Test

No Control Variable

```
Fixed-effects (within) regression               Number of obs      =       682
Group variable: ID                              Number of groups   =        31

R-sq:                                           Obs per group:
     within  = 0.5408                                         min =        22
     between = 0.3972                                         avg =      22.0
     overall = 0.5026                                         max =        22

                                                F(2,649)           =    382.18
corr(u_i, Xb)  = 0.0267                         Prob > F           =    0.0000
```

CP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Bubble	-.0135328	.0039706	-3.41	0.001	-.0213297	-.005736
HP	.0028064	.0001562	17.97	0.000	.0024998	.0031131
_cons	.3299512	.0199736	16.52	0.000	.2907305	.3691718
sigma_u	.05992365					
sigma_e	.08828724					
rho	.31538796	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(30, 649) = 8.61                     Prob > F = 0.0000
```

Add One Control Variable, ES

```
Fixed-effects (within) regression               Number of obs      =       682
Group variable: ID                              Number of groups   =        31

R-sq:                                           Obs per group:
     within  = 0.6140                                         min =        22
     between = 0.7310                                         avg =      22.0
     overall = 0.6355                                         max =        22

                                                F(3,648)           =    343.56
corr(u_i, Xb)  = 0.1645                         Prob > F           =    0.0000
```

CP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Bubble	-.0096056	.0036606	-2.62	0.009	-.0167936	-.0024176
HP	.0015589	.0001822	8.56	0.000	.0012011	.0019167
ES	.0744889	.0067212	11.08	0.000	.061291	.0876868
_cons	-.3946778	.0679037	-5.81	0.000	-.5280156	-.2613399
sigma_u	.04304839					
sigma_e	.08101061					
rho	.22019835	(fraction of variance due to u_i)				

F test that all u_i=0: F(30, 648) = 4.60 Prob > F = 0.0000

Add Two Control Variables, ES,UR

```
Fixed-effects (within) regression               Number of obs      =       682
Group variable: ID                              Number of groups   =        31

R-sq:                                           Obs per group:
     within  = 0.6176                                         min =        22
     between = 0.8173                                         avg =      22.0
     overall = 0.6628                                         max =        22

                                                F(4,647)           =    261.18
corr(u_i, Xb)  = 0.1921                         Prob > F           =    0.0000
```

CP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Bubble	-.0094159	.0036472	-2.58	0.010	-.0165777	-.002254
HP	.0015082	.0001827	8.26	0.000	.0011495	.0018669
ES	.0629632	.0081738	7.70	0.000	.0469128	.0790136
UR	.1133443	.0461109	2.46	0.014	.0227993	.2038893
_cons	-.3340037	.0720041	-4.64	0.000	-.4753936	-.1926138
sigma_u	.0359594					
sigma_e	.08069726					
rho	.16567043	(fraction of variance due to u_i)				

F test that all u_i=0: F(30, 647) = 2.68 Prob > F = 0.0000

Add Three Control Variables

```
Fixed-effects (within) regression               Number of obs      =       682
Group variable: ID                              Number of groups   =        31

R-sq:                                           Obs per group:
     within  = 0.6176                                         min =        22
     between = 0.8288                                         avg =      22.0
     overall = 0.6670                                         max =        22

                                                F(5,646)           =    208.66
corr(u_i, Xb)  = 0.1881                         Prob > F           =    0.0000
```

CP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Bubble	-.0091965	.0037379	-2.46	0.014	-.0165363	-.0018567
HP	.0014926	.0001916	7.79	0.000	.0011165	.0018688
ES	.0646907	.0103555	6.25	0.000	.0443561	.0850252
UR	.1113285	.0467351	2.38	0.018	.0195575	.2030996
GFS	-.0165519	.060848	-0.27	0.786	-.1360356	.1029319
_cons	-.3471882	.0868403	-4.00	0.000	-.5177116	-.1766648
sigma_u	.03453662					
sigma_e	.08075507					
rho	.15462189	(fraction of variance due to u_i)				

F test that all u_i=0: F(30, 646) = 2.46 Prob > F = 0.0000

Excluding Beijing, Shanghai, Tianjin and Chongqing Four Municipalities

```
Fixed-effects (within) regression               Number of obs      =       594
Group variable: ID                              Number of groups   =        27

R-sq:                                           Obs per group:
     within  = 0.5844                                         min =        22
     between = 0.7054                                         avg =      22.0
     overall = 0.6009                                         max =        22

                                                F(5,562)           =    158.03
corr(u_i, Xb)  = 0.0534                         Prob > F           =    0.0000
```

CP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Bubble	-.0125986	.0041472	-3.04	0.002	-.0207445	-.0044527
HP	.001296	.0002385	5.43	0.000	.0008275	.0017645
ES	.0758883	.0120871	6.28	0.000	.0521469	.0996298
UR	.0919313	.0666134	1.38	0.168	-.0389103	.2227728
GFS	-.0394366	.062339	-0.63	0.527	-.1618825	.0830093
_cons	-.4231023	.0975537	-4.34	0.000	-.6147168	-.2314879
sigma_u	.02761206					
sigma_e	.08030066					
rho	.10573648	(fraction of variance due to u_i)				

F test that all u_i=0: F(26, 562) = 1.75 Prob > F = 0.0129

Appendix3: Heterogeneity Test

Province with a Large Economy

```
Fixed-effects (within) regression               Number of obs      =       330
Group variable: ID                              Number of groups   =        15

R-sq:                                           Obs per group:
     within  = 0.6550                                         min =        22
     between = 0.8402                                         avg =      22.0
     overall = 0.6916                                         max =        22

                                                F(5,310)           =    117.71
corr(u_i, Xb)  = 0.2344                         Prob > F           =    0.0000
```

CP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Bubble	-.0080787	.0050001	-1.62	0.107	-.0179172	.0017598
HP	.0017136	.0002339	7.33	0.000	.0012534	.0021739
ES	.0425246	.0176243	2.41	0.016	.0078463	.0772029
UR	.0840209	.0588171	1.43	0.154	-.0317104	.1997521
GFS	.1013902	.2601446	0.39	0.697	-.4104823	.6132627
_cons	-.1412235	.1451166	-0.97	0.331	-.4267616	.1443146
sigma_u	.03925902					
sigma_e	.08114893					
rho	.18966166	(fraction of variance due to u_i)				

F test that all u_i=0: F(14, 310) = 3.68 Prob > F = 0.0000

Province with a Small Economy

```
Fixed-effects (within) regression               Number of obs      =       352
Group variable: ID                              Number of groups   =        16

R-sq:                                           Obs per group:
     within  = 0.5869                                         min =        22
     between = 0.8488                                         avg =      22.0
     overall = 0.6321                                         max =        22

                                                F(5,331)           =     94.04
corr(u_i, Xb)  = 0.1048                         Prob > F           =    0.0000
```

CP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Bubble	-.0103141	.0062174	-1.66	0.098	-.0225447	.0019166
HP	.0012167	.0003991	3.05	0.002	.0004315	.0020018
ES	.0742936	.0150417	4.94	0.000	.0447041	.1038831
UR	.2252169	.0808042	2.79	0.006	.0662624	.3841715
GFS	-.0598066	.0677428	-0.88	0.378	-.1930673	.0734541
_cons	-.4692266	.1251098	-3.75	0.000	-.7153372	-.223116
sigma_u	.02308641					
sigma_e	.0797789					
rho	.07727007	(fraction of variance due to u_i)				

F test that all u_i=0: F(15, 331) = 1.25 Prob > F = 0.2299