Vol. 6 (2025): Proceedings of the 2025 International Conference on Business, Management and Sustainability (ICBMS 2025)
E-ISSN: 3105-0522 P-ISSN：3105-0514
DOI: https://doi.org/10.70267/icbms.202514

Dual-City Mirroring and Market Differentiation: Research on Price Correlations and Optimization Paths in Shanghai and Hong Kong Real Estate Markets

Chenhao Ying[1*], Cancan Jin[2] and Lijia Du[3]

[1]*Business School of Ningbo University, Ningbo 11646, China*

[2]*School of Finance, Zhongnan University of Economics and Law, Wuhan 105203, China*

[3]*College of Economics, Jinan University, Guangzhou 10559, China*

**Corresponding author: Chenhao Ying.*

Abstract

Existing studies have revealed the impact of policies, interest rates and other factors on the real estate market but focus on single-factor and single-region analyses, and there is a gap in the study of cross-regional multifactor influence weights. In this study, the real estate market and housing prices in Hong Kong and Shanghai are used as the research objects, and a multiregional and multifactor correlation and difference comparison study is carried out, with the goal of revealing the correlation and differentiation mechanism of housing prices in Shanghai and Hong Kong. The results of this study reveal that housing prices are correlated in terms of seven dimensions, namely, supply, demand, and monetary policy, whereas differences exist in terms of policy instruments, population structure, land system and other factors. After validating each factor through a dual-track framework of correlation and differentiation, factor analysis and structural equation modeling were employed to further determine the weighting of different factors across the two regions. Based on this, a housing price fluctuation early warning mechanism was established to provide references and recommendations for policy implementation, risk mitigation, and real estate regulation stabilization in megacity clusters.(Li et al., 2012)

Keywords

differentiated regulation for megacities, structural equation modeling and factor analysis, housing price correlation and differentiation mechanism

1. Introduction

At present, housing prices in megacities fluctuate greatly, and people have insufficient confidence in real estate. Large fluctuations in real estate prices in various regions largely affect the lives of residents. As the Asia-Pacific financial centers of Shanghai and Hong Kong, real estate prices in Hong Kong and Shanghai largely reflect the economic situation in a region and react to the local economy, profoundly affecting the resilience and vitality of the local economy. On the basis of the results of the analysis of housing prices in Hong Kong and Shanghai for 2000 to 2025, the main factors affecting the two are highly correlated. However, the influences of some factors in the market are significantly different or even diametrically

opposite. While there is a strong correlation, it also shows that there are some differences between the two that affect the market.

Studies have demonstrated the effects of individual factors such as supply, demand, and economic growth on real estate prices. For example, Green et al. (2005) analyzed in detail Metropolitan-Specific Estimates of the Price Elasticity of Supply of Housing, and Their Sources. With respect to the mechanism of action of housing prices in metropolitan areas, Gibb et al. (2024) discussed the relationship between economic growth and dynamic changes in housing prices in "the Routledge handbook of housing economics". In addition, "Factor and Regional Difference Analysis on Real Estate Price" is used to compare the influence levels of each factor on the real estate price in a single region. However, there are still two research gaps. First, the driving mechanism of the correlation is not fully understood, as evidenced by Tsai (2022) in "The connectedness between Hong Kong and China real estate markets: spillover effect and information transmission". Although the latter study cited the exchange rate and stock market return as the key driving factors, it did not demonstrate the specific proportion of its influence on real estate or the variation in its influence in different cities. Second, the current research path is still limited. The literature focused on the research of a single city and failed to study the optimization mechanism of the correlation and difference of the factors among the cities. This makes it difficult for the existing models to explain: Why are there large differences in the stability of housing prices in Hong Kong and Shanghai, while the correlation coefficient is relatively high?

The innovation of this study lies in that, through the correlation-difference dual-dimensional evaluation framework, on the basis of panel data from 2000 to 2025, a quantitative evaluation system is established by establishing a multiple linear regression model using the factor. The analytical method analyzes the weights of the key influencing factors to establish a model of the real estate price influencing factors and thus promotes the study of the Shanghai real estate market and the policy optimization path to achieve the purpose of improving the stability of housing prices because of various factors, such as policies and supply and demand, and provides guidance for the governance of the new paradigm of mega-urban agglomerations.

2. Literature Review

In the field of real estate research, many studies have focused on the factors that influence housing prices, but most of them involve single-factor or single-region analyses, and gaps in the study of the complex interactions of multiple factors in different regions exist.

Most early studies focused on a single factor. In terms of demographic factors, the higher the population growth and density are, the greater the housing demand, increasing housing prices. Consumer preference is also key. Characteristics such as house type and location, as well as regional cultural and historical factors, significantly affect housing prices, with property values in high-quality locations, popular gateway areas or cultural heritage areas having higher values. Philipp Jäger and Torsten Schmidt (2017) studied a cross-country dataset of 13 advanced economies from 1950 to 2012 in their paper "Demographic change and house prices: Headwind or tailwind?" They concluded that the overall impact of demographic structural changes on housing prices is negative, and future demographic shifts may exacerbate downward pressure on housing prices. In addition, market monopoly and real estate market structure have attracted attention. In markets with a high degree of monopoly, developers have strong pricing power, and housing prices may be higher. The ratio of new construction to existing homes impacts housing supply, with a higher proportion of new construction potentially curbing price increases.(Kim & Lee, 2018)

However, the existing studies are limited. Despite in-depth studies on individual factors, the comprehensive influence of multiple factors in different regions has not been fully explored. For example, the interactions and differences in the degree of influence of demographic and policy factors on housing prices in Shanghai and Hong Kong are still unclear. Moreover, single-area studies lack an understanding of the correlation of factors and the optimization mechanism of the differences among cities, and it is difficult to explain why cities with high housing price correlation still have significant differences in terms of the stability of housing prices.

3. Empirical Validation of Correlations and Differentiation

3.1 Relevance Verification

3.1.1 Economic Similarity

Hong Kong and Shanghai are both China's core economic and financial hubs, with prosperous foreign trade and frequent population flow. The economic development trends in recent years have been highly convergent, with both having entered the postindustrialization stage, with the tertiary industry accounting for a prominent proportion, led by finance, services, and tourism. These industries are deeply intertwined with real estate and face challenges in restructuring.

In terms of GDP growth, the economic recovery of the two countries after the epidemic was significant. Hong Kong's market will start to increase in 2020, and its GDP will continue to rise after 2023; Shanghai's economy will grow steadily during 2019–2024. An increase in GDP affects the property market through both ends of supply and demand, which not only stimulates the demand of residents to buy houses but also enhances the investment confidence of developers.

In terms of trade exchanges, as a pilot free trade zone, Shanghai has achieved significant results in terms of institutional innovation and the introduction of foreign capital; Hong Kong, which relies on the Greater Bay Area, has economic and trade connections worldwide. The two places strongly attract capital, and the logic of the influence of real estate by economic fluctuation and capital flow is similar.

3.1.2 Similarity in Demographic Characteristics

Hong Kong and Shanghai have significant similarities in population density and population structure. In terms of population density, Shanghai's resident population is nearly 25 million, and Hong Kong's resident population is over 7.53 million, both of which have a high degree of population agglomeration because of economic development, and the situation of tension in land resources is similar.

In terms of population structure, the two places were dominated by migrant workers and floating people. As of the end of 2023, Shanghai's permanent immigrant population will reach 10,072,800; Hong Kong's immigration inflow will be 21,000 in 2023–2024, an increase for three consecutive years. Moreover, the aging trend of the two places is obvious: the population of Hong Kong aged 65 years and over accounts for 21.37%, the degree of aging of Shanghai is increasing each year, and the phenomenon of a declining birth rate is exacerbated. Demographic characteristics have led to an increase in the consumption patterns of the elderly when they invest in real estate, which has increased the pressure on housing, and high population mobility has continued to affect real estate prices.

3.1.3 Effects of History, Culture and Consumer Preferences on Real Estate

The cultural differences between China and the West significantly affect real estate consumption. Chinese culture emphasizes that “the ancestors planted trees and the descendants enjoy the shade.” There is a land plot, which makes them inclined to buy houses for investment. Elderly people often leave their houses for their children, which increases housing prices. In addition, the price stability of Chinese real estate is supported by land culture.

Chinese in Hong Kong account for 96%. Although influenced by Western materialistic views, their culture is the same as that of the mainland. The concept of elderly residents buying a house for elderly people and reserving a house for their children is highly consistent with that in Shanghai. With respect to the attitude toward financial assets, the cultural influence converges.

3.1.4 Market Structure Analysis

As seen from the real estate industry data of Shanghai and Hong Kong in the past ten years in Tables 1 and 2, the level and trend of real estate development in the two places were similar; the development area and the number of buildings remained stable with an upward trend.

In terms of housing prices and sales volume, Shanghai has shown a rapid upward trend over the past ten years, while Hong Kong’s overall fluctuations have gradually increased, but the changes have been more stable. A comparison of the housing construction area and the sales area of commercial housing in the two

places revealed that the sales area was slightly greater than the construction area. The market supply and demand generally increased each year, and the supply exceeded the demand in both places. This has been reflected in the gradual rise in housing prices in the two places over the past ten years.

In addition, since the pilot program of property tax, the proportion of ordinary residential investment in total residential investment has increased in Shanghai, and the proportion of investment in villas and high-end apartments has relatively decreased; the proportion of ordinary residential sales in total residential sales has risen, showing a U-shaped trend, indicating that Shanghai has adopted reasonable policies. Plan land and increase the supply of ordinary apartments to meet the housing needs of a large population.

Table 1: Basic information on Shanghai's real estate industry

Year	Real estate development assets (100 million yuan)	Housing construction area (10,000 square meters)	Completed floor area (10,000 square meters)	Sales area of commercial buildings (10,000 square meters)	Sales of commercial housing (100 million yuan)
2014	3952.40	14652.98	1222.06	1627.73	3932.27
2015	3795.37	14046.74	1044.59	1687.52	4025.14
2016	3709.25	13801.78	1105.97	1720.86	4821.56
2017	3853.00	13730.05	1031.44	1448.17	4332.21
2018	4033.56	13636.82	1090.55	1530.18	4939.38
2019	4223.38	13692.25	1222.90	1657.77	5528.37
2020	4459.55	13752.97	1342.05	1965.08	7056.80
2021	4824.07	14026.07	1304.19	2326.42	8227.79
2022	4938.01	14208.64	1072.99	1822.32	6689.54
2023	5139.36	14421.32	1367.57	2055.24	7620.45

Data source: Compiled based on data from the National Bureau of Statistics and Shanghai Statistics Bureau.

Table 2: Basic information on Hong Kong's real estate industry

Year	Number of private residential building unit completions (10,000 units)	First-hand private residential sale contracts (thousand cases)	Total value of first-hand private residence sales contracts (HK$100 million)	Number of construction sites for overall residential buildings (units)
2014	1.82	2.47	1705.48	427
2015	1.34	2.15	1507.69	420
2016	1.86	2.06	1540.27	447
2017	2.02	2.34	2320.14	497
2018	1.69	2.19	2094.38	479
2019	1.91	1.69	1425.44	473
2020	1.62	1.72	1571.36	445
2021	1.95	2.01	2241.69	471
2022	1.64	1.79	1901.79	466
2023	2.14	2.37	2827.97	504

Data source: Compiled by the Statistics Bureau of the Hong Kong Government.

3.2 Differential Manifestation

3.2.1 Policy Instruments

As shown in Table 3 and Table 4, the real estate policies of Hong Kong and Shanghai in the past ten years revealed that the housing price policies in both places tended to first loosen, then tighten and then loosen, but there were differences in the changes in policy intensity.

Hong Kong implemented stamp duty control and a vacant first-hand housing tax policy from 2015 to 2018, with a moderate stamp duty intensity; from 2018 to 2022, stamp duty rates increase significantly to 15% for local residents and 30% for non-Hong Kong households, and the hot recruitment policy is fully implemented, with the policy intensity reaching a peak. After 2023, the stamp duty will decrease to 7.5%, and the hot offer policy will be gradually withdrawn; in 2024, all residential property demand management measures will be completely withdrawn, and in 2025, there will be no restrictions on home purchases. The minimum down payment for non-Hong Kong residents is 30%, and the down payment ratio for investment properties is usually 40%.

In 2011, Shanghai only levied property taxes on some individual housing in some pilot areas; in 2016, Shanghai implemented the "Nine Regulations" and tightened restrictions on house purchases; and in the era of "five restrictions" in 2017, it introduced policies related to enterprise house purchases in 2018. The pilot policies of property taxes were adjusted; in 2021, policies such as the purchase of houses by divorce and restrictions on the purchase of houses at foreclosure and housing gifts were introduced; and in 2024–2025, the previous policies will continue to apply, with the unit price of new houses purchased being ≤ 94,446 yuan at a tax rate of 0.4%, and there are explicit regulations governing the payment of property tax for home purchases by residents with different household registrations. On the whole, the changes in Shanghai's policy intensity in the past ten years are less than those in Hong Kong.

Since the second half of 2024, central and local governments have intensively introduced easing policies, with the goal of "preventing risks, destocking, and improving the new model of real estate development" by optimizing the purchase restriction policy and adjusting the down payment ratio and interest rates to boost the market and liberalize housing prices. After the purchase restriction, market activity increased significantly, and market expectations improved.

Table 3: Hong Kong's real estate market policies in the past ten years

Year	Policy name	Policy content
2015-2018	stamp duty control policy, Empty first-hand housing tax policy	Depending on property prices, the tax rate for Hong Kong permanent residents ranges from 4.5% to 8.5%, while non-permanent residents face a flat rate of 30%. On June 28, 2018, a vacant property tax was approved for newly completed homes, levied at approximately 5% of the property value.
2019	Stamp duty adjustment policy	The stamp duty on the second home with local household registration and the purchase of houses by nonlocal household registration is increased to 15%.
2022	Subsidized housing resale spicy policy	The house can not be resold at a higher price than the original price within the first 5 years, and the house can be freely sold after 15 years.
2023	Partial stamp duty adjustment policy	The buyer's stamp duty and the new residential stamp duty have been reduced to 7.5%, the applicable period of the additional stamp duty has been shortened from three years to two years, and the "exemption first, then levy" arrangement has been implemented for the stamp duty on the home purchase of foreign talents.
2024	Comprehensive withdrawal of "spicy tricks" policy	All residential property demand management measures are completely withdrawn, and the additional stamp duty, buyer's stamp duty and new residential stamp duty are cancelled. The purchase of houses is no longer subject to the previous purchase restriction policy, and everyone only needs to pay a first-home stamp duty of 1.5% to 4.25%.
2025	Comprehensive withdrawal of "spicy tricks" policy	There is no restriction on house purchase. Non-Hong Kong residents can make a minimum down payment of 30% for house purchase, and the down payment ratio for investment house purchase is usually 40%.

Table 4: Shanghai's real estate market policies in the past ten years

Year	Policy name	Policy content
2011	"Interim Measures of Shanghai Municipality for the Pilot Program of Levying Real Estate Tax on Some Individual Housing"	Housing newly purchased by non-Shanghai resident families in this city. The market transaction price of taxable housing is temporarily calculated and paid at 70% of the market transaction price of taxable housing, the applicable tax rate is temporarily set at 0.6%, and the market transaction price per square meter of taxable housing is lower than twice (including 2 times) the average sales price of newly built commercial housing in Shanghai in the previous year, the tax rate is temporarily reduced to 0.4%. Residential families in this city who purchase newly purchased houses with a total area of no more than 60 square meters per capita are temporarily exempt from the tax; qualified high-level talents and house buyers who have held this city's residence permit for three years or more and have worked and lived in this city are eligible. The only house for newly purchased families is temporarily exempted.
2016	"Shanghai Nine Measures" - the strictest new policy on the property market in history	The number of years for nonmunicipal household registration to pay individual income tax or social insurance for house purchase shall be increased, from the cumulative payment of personal income tax or social insurance for a total of 2 or more years in the first 3 years from the date of purchase to the value of 5 consecutive years or more since

Year	Policy name	Policy content
		the date of house purchase.
2017	Small housing rectification, new policies in the land market, new rules on the lottery for the opening of the market	The Shanghai property market has entered the era of "five restrictions" including purchase restrictions, loan restrictions, price restrictions, sales restrictions, and trade restrictions.
2018	Policies on corporate house purchase	To purchase commercial housing, an enterprise must simultaneously meet the conditions of having been established for 5 years, the cumulative amount of taxes paid in this municipality reaching RMB 1 million, the number of employees is 10 or more, and the enterprise has paid social security and provident funds for 5 years or more in accordance with the regulations ((Except for enterprises that have paid taxes of more than 5 million yuan). At the same time, the relisting and trading period of commercial housing purchased by enterprises has been increased from "3 years" to "5 years".
2020	"Notice of the Shanghai Municipal Finance Bureau, the Shanghai Municipal Taxation Bureau of the State Taxation Administration, and the Shanghai Municipal Housing Administration on Several Issues concerning the Pilot Program of the Collection of Property Tax on Some Individual Housing in this Municipality" (Hucaifa [2020] No. 18)	The houses purchased or acquired by the city's resident families as a result of house expropriation or demolition are temporarily exempted from property tax within the state and city compensation standards; the houses acquired by the city's rural residents through the home site replacement pilot policy are temporarily exempted. When changes occur in a household's residential housing situation that affect taxable housing property tax matters, the household may file a declaration with the tax authority where the taxable housing is located and re-submit the property tax declaration and certification. Tax payments shall be adjusted starting from the month following the tax authority's re-certification.
2021	Divorce and house purchase policy	If a couple purchases commercial housing within 3 years of divorce, the number of housing units they own is calculated based on the total number of housing units before the divorce.
2021	Foreclosure purchase restriction policy	The purchase restriction of foresale houses in Shanghai will be included, and the purchase of foreclosure houses must have the qualifications to buy houses in this city.
2021	Housing gift policy	If the transfer of housing is by way of gift, the recipient shall comply with the national and this municipality's housing purchase restriction policies, and the house shall still be included in the number of houses owned by the donor within 5 years.
2024-2025	Continue to use the previous policy	The unit price of newly purchased houses is ≤94,446 yuan, and the tax rate is 0.4%. The city's registered residents are exempt from real estate tax on the purchase of the first set of homes. The newly purchased homes that are the second set or above are exempt from real estate tax on the per capita floor area of 60 square meters. "Taxable area" is subject to property tax. Residents who have held the long-term residence permit in this city for more than 3 years are exempted from paying property tax; those who have held the long-term residence permit for less than 3 years are required to pay the property tax first and then it will be refunded. Nonlocals and foreigners without a long-term residence permit are required to pay property tax in full each year until the property is sold.

3.2.2 Market Monopoly and Land Supply

The degree of monopoly in the Hong Kong and Shanghai real estate markets is relatively high, but the expression forms are different. The Hong Kong real estate market affects housing prices through the control of land supply and the market cycle; only 24% of the land is used for residential supply, resulting in "supply-based land dependence".

The Shanghai real estate market shows a differentiation phenomenon. The top ten developers control more than 60% of the supply of new homes and use coordinated pricing to drive up housing prices in the core areas, resulting in the hoarding of real estate inventory in the outer ring road and causing inflated housing prices with the help of coordinated pricing and information asymmetry.

4. Methodology

4.1 Variable Description

The definitions and descriptions of the variables of Shanghai and Hong Kong involved in the empirical study are shown in Tables 2–3.

Table 5: Description of Variables for Shanghai

Variable name	Variable symbol	Variable definition
Level of economic development	GDP_{SH}	Shanghai per capita GDP
Population density	$Population_{SH}$	Shanghai Permanent Population
Real estate market structure	$Area_{SH}$	Per capita housing area in Shanghai
Real estate market stability	$Price_{SH}$	Shanghai house prices
Purchasing power of the masses	$Ratio_{SH}$	Shanghai house price-to-income ratio
Shanghai policy intensity	$R_{gj,sh}$	Interest rate of personal housing provident fund loan
Trade and foreign relations	X_{SH}	Shanghai export amount
Land planning and supply	LS_{SH}	Land supply in Shanghai
Shanghai consumer preferences	U_{SH}	Shanghai consumers prefer real estate by area

Table 6: Description of the variables for Hong Kong

Variable name	Variable symbol	Variable definition
Level of economic development	GDP_{HK}	Hong Kong per capita GDP
Population density	$Population_{HK}$	Hong Kong Permanent Population
Real estate market structure	$Area_{HK}$	Per capita housing area in Hong Kong
Real estate market stability	$Price_{HK}$	Hong Kong housing prices
Purchasing power of the masses	$Ratio_{HK}$	Hong Kong house price-to-income ratio
Hong Kong policy intensity	$R_{gj,HK}$	Raw house price data
Trade and foreign relations	X_{HK}	Hong Kong export amount
Land planning and supply	LS_{HK}	Annual land sales area of Hong Kong Lands Department
Hong Kong Consumer Preferences	U_{HK}	Hong Kong consumers prefer real estate area

4.2 Descriptive Statistics

In view of the availability of data, in the present study, the GDP, average land prices, and population density of Shanghai and Hong Kong during the period of 2015–2025 were selected by searching the websites of the National Bureau of Statistics and the Hong Kong Government's Bureau of Statistics, etc., in combination with the web crawler method. A comparison of the standard deviation and mean of each variable reveals that the mean values of Shanghai's and Hong Kong's GDP are 23679.63 and 2094038.24, respectively. Hong Kong's GDP is higher than that of Shanghai, as seen from the observation of the maximum and minimum values of the GDP in the two regions in the past 20 years. Shanghai's GDP has increased significantly, and Hong Kong's GDP has experienced relatively small changes in recent years; thus, the changes in GDP are relatively stable. Owing to its geographic area being larger than that of Hong Kong, the per capita housing area in Shanghai is larger than that in Hong Kong, with mean values of 32.18 and 15.51, respectively. In terms of the amount of imports/exports, owing to Hong Kong's proximity to Southeast Asia and the convenience of exporting, Hong Kong's export amount was higher than that of Shanghai (41937.81 and 11397.88, respectively). In general, these two places are both areas with high GDP, high export value, high housing prices and high population density in China.

4.3 Pearson Correlation Coefficient

On the basis of the Pearson correlation coefficient matrix, in this study, the main influencing factors and the difference characteristics of housing prices in Shanghai and Hong Kong were analyzed, and predictions were made. The prediction results are shown in Figure 1.

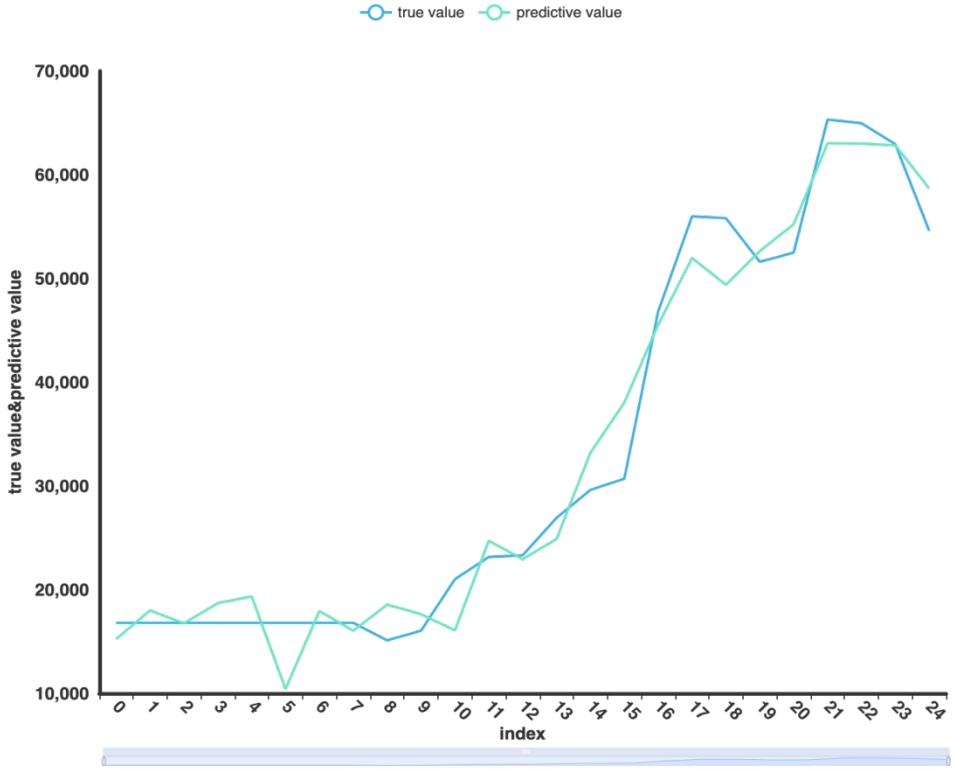
Table 7: Descriptive statistics of the Shanghai variable

Variable	Mean	Std	Max	Min
GDP_{SH}	23679.6292	14807.9556	53926.71	4812.2
$Population_{SH}$	2223.94097	311.202064	2489	1608.6
$Area_{SH}$	32.18	6.864704	37.57	16.7
$Price_{SH}$	40234.2139	18245.7570	65310.25	15111.7115
$Ratio_{SH}$	41.721786	5.093315	49.2075	36.015
$R_{gj,sh}$	3.553	0.793348	4.77	2.35
X_{SH}	11397.8823	4863.408	18200	1990.37
LS_{SH}	921.258	232.265	1240.69	406.7
U_{SH}	105.14	20.71	160	80

Table 1: Descriptive statistics of Hong Kong variables

Variable	Mean	Std	Max	Min
GDP_{HK}	2094038.24	636183.670	3176993	1256669
$Population_{HK}$	7134.632	292.366	7532	6688.25
$Area_{HK}$	15.514	0.5259.6	16.31	14.5
$Price_{HK}$	77600.72	47665.6604	163970	19292
$E_{HKD/CNY}$	0.907806	0.013104	0.93171	0.88196
X_{HK}	41937.81	16303.12	81092.478	11730.486
U_{HK}	46	3.6799	52	40
LS_{HK}	152962.864	117100.811	384065	9573.9
$R_{gj,HK}$	56.57458564	39.50952305	100	16.02209945

Figure 1: Prediction–realization diagram



4.3.1 Analysis of the Factors Influencing Shanghai's Housing Prices

GDP (ρ=0.936, $p<0.001$) and the urban competitiveness score (ρ=0.934, $p<0.001$) constitute the core drivers of housing prices, reflecting the supporting factors of urban development factors and the existing economic foundation on housing prices; the interest rate (ρ=- 0.912, $p<0.001$) is in line with the classic logic that "a rise in loan interest rates increases the cost of house purchase, curbing the demand for house purchases", indicating that the Shanghai market is sensitive to loan costs.

The significant negative correlation between housing prices and housing area preference (ρ=-0.825, $p<0.001$) and per capita housing area (ρ=-0.690, $p<0.001$) indicates that the dominant demand for small and medium-sized apartments or the oversupply of housing will reduce housing prices and support the supply and demand hypothesis.

The moderate negative correlation of land supply (ρ=-0.676, $p<0.05$) was inconsistent with the theoretical expectations. It was speculated that it was constrained by the land use structure and the development of real estate agents; therefore, it needed to be deconstructed in combination with factor analysis.

Table 9: Analysis of Factors Influencing Shanghai Housing Prices

Influencing factors	Pearson correlation coefficient
GDP	0.936
City competitiveness score	0.934
Interest rate	-0.912
Housing size preference	-0.825
Per capita housing area	-0.690
Land supply	-0.676

4.3.2 Analysis of the Factors Influencing Hong Kong Housing Prices

GDP (ρ=0.982, $p<0.001$) and the real estate policy intensity score (ρ=0.930, $p<0.001$) maintained a strong positive correlation, but the interest rate (ρ=0.958, $p<0.001$) showed an abnormally strong positive correlation, reflecting the linked exchange rate system. Given the driving effect of international capital flows on housing prices, the stimulating effect of the overall low interest rate environment on investment demand exceeds the dampening effect of credit costs.

The Hong Kong population (ρ=-0.964, $p<0.001$) is the core feature, which reveals that the supply and demand imbalance between high population density and housing shortage–population growth aggravates the housing shortage, and the excessive supply and demand imbalance leads to the spillover of housing demand and a reduction in housing prices.

The weak correlation of land supply (ρ=0.150, $p>0.1$) strengthens the belief that “structure is better than scale.” Currently, the monopoly of some land in Hong Kong without development is the key bottleneck.

Table 10: Analysis of the factors influencing Hong Kong’s housing prices

Influencing factors	Pearson correlation coefficient
GDP	0.982
Real estate policy intensity score	0.930
Interest rate	0.958
Hong Kong population	-0.964
Land supply	0.150

4.4 Multivariable Linear Regression Model

4.4.1 Shanghai Housing Price Model

The negative coefficient of the interest rate (β=-5980.02, $p<0.001$) indicates that credit costs have a significant inhibitory effect on the Shanghai market. For every 1 percentage point decrease in the interest rate for the first home, in theory, the housing price will increase by approximately 5,980 yuan (β=-12.37, $p<0.05$), reflecting the marginal effect of population density on housing prices. Population overload in the core area may force the spillover of housing demand, inhibiting prices in the central area.

4.4.2 Hong Kong Housing Price Model

Core feature: The positive interest rate anomaly (β=88791.07, $p<0.001$) reveals that the Hong Kong market is highly sensitive to international capital and that investment demand is the leading factor in the low interest rate environment. For every 1 percentage point decrease in the interest rate, housing prices increase by approximately 88,800 yuan in theory. The strong negative effect of the Hong Kong population (β=-34.04, $p<0.01$) quantified the distortion of prices by population growth and the housing supply gap——for every 10,000 population increase, the housing price decreased by approximately RMB 34, which is actually an extreme manifestation of the imbalance between supply and demand.

Table 11: Table of multivariable linear regression models for the two regions

City	Variable	Regression coefficient (β value)
Shanghai	Interest rate	-5980.02
	Permanent population	-12.37
Hong Kong	Interest rate	88791.07
	Permanent population	-34.04

4.5 Structural Equation Modeling (SEM) and Factor Analysis: Policy Transmission Paths by City

4.5.1 SEM of Shanghai

(1) Monetary policy path: loan interest rate ↓→acquisition costs ↓→ demand for self-occupancy ↑ (path coefficient=0.65, p<0.001) → house prices ↑, interest rate for purchasing a second home ↑→ investment demand ↓ (path coefficient=-0.42, p <0.01) → house price ↓, forming a differentiated control window

(2) Land policy path: proportion of residential land ↑ → supply of small and medium-sized households ↑ (path coefficient=0.78, p<0.001) → matching degree of preferred area ↑ → housing prices ↓ (β=-3425.93), verifying that "the optimization of the supply structure reduces prices".

Factor analysis: One common factor was extracted (eigenvalue = 6.82, variance explained rate 85.3%), containing high loads such as GDP (-0.993), fraction (-0.996), and permanent population (-0.910), which was defined as the "economic-population-driven factor". factor", indicating that Shanghai's housing prices are affected mainly by urban economic fundamentals and population concentration.

4.5.2 SEM of Hong Kong

(1) Interest rate-related paths under the exchange rate system: interest rate under the exchange rate system↑→fund cost↑→financing cost for developers↑(path coefficient=0.81, p<0.001)→housing supply ↓→house prices↑

This link is hedged with the inhibition effect on the demand side (path coefficient=-0.55, p<0.01), which explains the positive anomaly of interest rates

(2) Land policy addressing: sea reclamation/old renovation efficiency↑→ residential land supply↑(path coefficient=0.92, p<0.001)→per capita housing area↑(β=-10036.01)→housing prices↓, highlighting the "breakthrough in land bottleneck" of the core role.

Table 12: Path diagram of urban policy transmission

City	Policy path	Specific path	Path coefficient
Shanghai	Monetary policy path	Loan interest rate ↓→Purchase cost ↓→Self-occupancy demand↑→House price↑	0.65
		Interest rate for purchasing a second set of houses ↑ → investment demand ↓ → house price ↓	-0.42
	Land policy pathways	Proportion of residential land↑→supply of small and medium-sized houses↑→matching degree of preferred area↑→prices↓	0.78 (first half) β = -3425.93 (second half, correlated with housing prices)
Hong Kong	Interest rate related paths under the exchange rate system	Under the exchange rate system, interest rate ↑ → cost of funds ↑ → financing cost for developers ↑ → housing supply ↓ → housing prices ↑	0.81
		Interest rate ↑ → demand-side inhibition effect (offset with the previous path)	-0.55
	Approaches to land policy	Land reclamation/urban renewal efficiency ↑ → Residential land supply ↑ (Path coefficient = 0.92, p<0.001) → Per capita housing area ↑ (β = -10036.01) → Housing prices ↓	0.92 (first half) β = -10036.01 (second half, correlated with housing prices)

Factor analysis: Two common factors were extracted (the cumulative variance explained rate was 82.7%) as follows:

Factor 1 (economic and demand-driven, 55%): GDP (0.981), the Hong Kong population (0.985), and the interest rate (0.997) are strongly loaded, reflecting the interactive influence between an export-oriented economy and the population structure;

Factor 2 (supply-side regulation, 27%): Land supply (0.994) alone had a strong load, which validated the hypothesis that "land policy is independent of economic demand."

5. Discussion

5.1 Counterintuitive Findings and Mechanism Analysis of Housing Price Drivers in Large Cities

Through city alliance and difference analysis, for the first time, this study revealed the differentiation factors in the driving mechanisms of housing prices in two megacities, Shanghai and Hong Kong, and challenged the traditional assumption of "unified market regulation". This is in sharp contrast to the logic of "interest rates suppress demand" in mainstream theories and reflects the leading role of international capital flows on investment demand under the linked exchange rate system—an overall low level. The interest rate environment has attracted an influx of international capital, which has pushed up asset prices. The effect far exceeds the suppression of owner-occupancy demand by the cost of credit, causing prices to rise instead of fall. These findings provide a stability mechanism for countries with a monetary policy anchor system, namely, the "interest rate–capital flow–house price" trinity detection mechanism, to avoid one-way adjustment on the isolated demand side.

The negative paradox between Hong Kong's population and housing prices (ρ=-0.964) overturns the classic model of "the positive stimulating effect of population inflow on housing prices". In essence, this phenomenon is the extreme of the manifestation of "rigid land supply constraints"; the available land in Hong Kong accounts for only 24%, the population density reaches 6,800 people/square kilometer, and the excessive widening of the housing supply-demand gap to extreme levels has led to distorted market behavior: population growth has exacerbated housing shortages, while speculative demand has driven accelerated price increases. The negative coefficient in the model actually serves as an inverse measure of the "degree of supply-demand imbalance." This modifies the unidirectional effect assumption of demographic variables, confirming that the housing problem in superdense cities is essentially a structural contradiction on the supply side.

5.2 Deconstruction and Innovation of Policy Factors: From "Scale-driven" to "Structural Precision"

Through the integrated use of factor analysis and structural equation modeling, the factors affecting housing prices are deconstructed into two independent dimensions for the first time: economic demand driving factors (Factor 1, which explains 77.9% of the variance) and supply-side regulating factors (Factor 2, which explains 14.8% of the variance). In the Shanghai model, the strong negative effect of the preference area (β=-443.70) and per capita housing area (β=-116.53) indicates that in the current market, the housing supply structure (e.g., the proportion of small and medium-sized households) has a greater regulatory effect on prices than does scale expansion alone does, echoing the policy orientation of "precisely matching rigid needs" against the background of the definancialization of housing. In the Hong Kong model, the load of land supply on Factor 2 reached 0.994, indicating that it played an important role in meeting economic needs—the extra space created by land reclamation (an addition of 2,200 hectares is planned to be added in the next ten years), and the improvement in the efficiency of reconstruction of old urban areas is key to cracking "the world's most unaffordable housing market" (Urban Reform Institute, 2023).

The finding that structural reform is greater than pure-scale expansion provides theoretical support for megacities to break through policy dependence and simply strengthen supply. The traditional policy of "increasing the total amount of land supply" has a limited effect in Shanghai (land supply ρ=-0.676), whereas the policy of "optimizing residential land supply" can directly reduce the matching degree of the preferred area, thereby inhibiting housing prices. The practice of Hong Kong proves that when land supply is limited by geography, the focus of policy should be "structural optimization" rather than relying solely on scale expansion.

5.3 Innovations in the Policy Evaluation Framework

In this study, a multidirectional analysis system (correlation → regression → SEM → factor analysis) was formed to perform closed-loop verification, thereby improving the scientific nature of verification:

Shanghai's housing price regulation needs to rely on demand-side regulation. On the basis of the significant negative effect of interest rates (β=-5980.02), the mechanism of "linking the interest rate on first-home loans to the CPI" can be implemented to ensure self-occupancy demand through low interest rates during the benign inflation period. Moreover, a progressive mechanism of "interest rate–holding period" is established for the second house to curb short-term speculation and achieve the effect of the decinancialization of real estate.

Hong Kong's housing price regulation focused on supply-side reforms. In response to the negative population paradox (β=-34.04), a dynamic matching model of "population growth–public housing supply" needs to be established to increase the supply in a timely manner on the basis of the newly increased population and directly weaken the market distortion caused by the gap between supply and demand.

This city-by-city modeling method breaks through the limitation of the "one size fits all" policy and confirms that even for cities with similar economic levels, the regulatory logic needs to be deeply adapted to the institutional background and geographic constraints.

5.4 Limitations and Future Research Directions

This study has made innovative attempts in the field of heterogeneous market analysis, but there are still three areas for improvement. First, the variable segmentation is not deep enough, and the diversion effects of affordable housing and commercial housing in the market are not differentiated. Subsequent studies may consider introducing "social housing coverage" as an adjustment variable to improve the research model. Second, the hysteresis effect was ignored. In fact, there is a lag period of 2 to 3 years in the effect of land supply on housing prices. In the future, it is necessary to construct a dynamic panel model that includes the lagged term to more accurately reflect the relationship between the two. Third, the treatment of regional heterogeneity was too simplistic. Taking the suburbs of Shanghai and the New Territories of Hong Kong as examples, the driving factors of housing prices in these two regions significantly differ. The geographic weighted regression (GWR) method can be used to conduct a more detailed analysis of spatial differentiation.

6. Conclusion

6.1 Main research findings and practical application

Using city-by-city modeling and validation through various methods, (Mankiw & Weil, 1989)this study successfully revealed three core patterns of housing price regulation in megacities: 1. Mechanism heterogeneity (indicating that the policy transmission mechanism must closely fit the institutional characteristics of the cities). 2. Structural priority 3. The data-driven paradigm ("economic demand–supply regulation" dual-factor analysis framework promotes policy quantification); thus, the following policy implications can be directly derived.

1. Shanghai: With "demand structure matching" as the core of regulation, the speculative housing demand is suppressed through the implementation of a differentiated interest rate policy (preferential interest rate for the first home and higher loan interest rate for multiple homes), while at the same time, in terms of land supply, a targeted increase in small amounts of land for family housing was released to achieve the goals of stabilizing demand and adjusting structure.

2. Hong Kong: With "supply-side breakthroughs" as the focus of regulation, the proportion of residential land in land supply is increased by means of land reclamation and the acceleration of old city renovation. Moreover, the construction of "simple public housing" was actively promoted to effectively alleviate the imbalance between the "population and housing".

This study adjusts the universality assumption of traditional real estate price theory and confirms that the housing problem in megacities is the result of the interaction of "institutional constraints-geographic

constraints-market structure". The proposed framework of "heterogeneous regulation by city" provides an example of a "data-driven, precise adaptation" policy for similar global cities such as New York and Tokyo and promotes a shift in real estate research from focusing on "common laws" to focusing on "personality decoding".

6.2 Future Research Directions

Follow-up research can be conducted in more depth in the following areas. First, the long-term impact of aging on the structure of housing demand (in Shanghai, for example, the proportion of the population 65 years and over has reached 21.8%); second, the effect of the green building policy on housing prices (for example, the effect of Hong Kong's "Green Building Environmental Assessment" on the price premium of high-end residential buildings); and third, the possible impact of the digital renminbi pilot on the liquidity of the real estate market. The continuous expansion of the research boundary of the heterogeneous market will help provide more prospective solutions to the housing problem in megacities.

This study uses rigorous econometric analysis methods and theoretical innovation to analyze in depth the complex mechanisms of housing price regulation in megacities. The core goal of this research is to clarify that there is no unified policy applicable to all cities and that only by in-depth analysis of urban characteristics can we achieve accurate governance. The conclusions of this research not only enrich the theory of real estate economics but also provide an operable "heterogeneous solution" to the housing problem in global megacities.

References

Gibb, K., Leishman, C., Marsh, A., Meen, G., ViforJ, R. O., & Watkins, C. (2024). *The Routledge handbook of housing economics*. Routledge.

Green, R. K., Malpezzi, S., & Mayo, S. K. (2005). Metropolitan-specific estimates of the price elasticity of supply of housing, and their sources. *American Economic Review, 95*(2), 334–339. https://doi.org/10.1257/000282805774670077

Kim, S., & Lee, J. (2018). The impact of demographic changes on housing markets: a cross-country analysis. *Housing Studies, 33*(2), 215-238.

Li, L., Xiao, L., & Xiao, J. W. (2012). Factor and regional difference analysis on real estate price. *China Economic Review, 23*(4), 876-890.

Mankiw, N. G., & Weil, D. N. (1989). The baby boom, the baby bust, and the housing market. *Regional Science and Urban Economics, 19*(2), 235-258. https://doi.org/10.1016/0166-0462(89)90005-7

Tsai, I. C. (2022). The connectedness between Hong Kong and China real estate markets: spillover effect and information transmission. *Empirical Economics, 63*(1), 287-311. https://doi.org/10.1007/s00181-021-02143-y

Urban Reform Institute. (2023). *Demographia international housing affordability*. https://urbanreforminstitute.org/wp-content/uploads/2023/03/Demographia-International-Housing-Affordability-2023-Edition.pdf

Funding

This research received no external funding.

Conflicts of Interest

The authors declare no conflict of interest.

Acknowledgment

This paper is an output of the science project.