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Exploring the Impact of China's Economic Dynamics on the Real Estate Market: 2002-2022

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Abstract: The complex interaction between China's economic dynamics from 2002 to 2022 and its real estate market is investigated in this article. It looks at the market's influence as a main economic driver, its relationships with the financial system, and regional differences in investment impacts. By means of regression analysis, the study indicates a noteworthy positive association between housing prices and the Consumer Price Index (CPI), therefore implying that inflationary pressures raise real estate values. The results underline the importance of cautious policy management to reconcile economic development with housing affordability, hence addressing regional differences and the wider consequences of inflation on housing markets. Also, the paper investigates how income inequality, urbanization rates, and government policies could shape the expansion of the real estate market. It emphasizes the importance of region-specific policies to strike a compromise between social equality and economic growth. The results give legislators trying to steady the housing market among changing economic circumstances important new perspectives.

Keywords: Chinese economic, CPI, housing price.

1. Introduction

China's real estate market has become a vital part of the country's economy, significantly affecting its financial system and macroeconomic growth. In 2017, housing sales reached 13.37 trillion RMB, accounting for 16.4% of China's GDP [1]. The interconnection between the real estate market and the financial system is evident through several channels: households' asset portfolios heavily favor real estate due to limited investment options; local governments rely on land sale revenues for debt financing, and firms use real estate as collateral for borrowing. Banks, in turn, face substantial exposure to real estate risks through loans to various stakeholders, including households and developers.

Research has explored the intricate relationship between the real estate market and macroeconomic growth. One study indicates that while rising housing prices can impede economic growth, the impact varies regionally-less-developed areas may benefit from housing price appreciation with appropriate financial support, while more developed regions may experience negative effects [2]. Another analysis highlights that housing investment has a stronger short-term impact on economic growth than non-housing investment, suggesting that fluctuations in housing investment significantly influence economic cycles [3].

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Econometric studies have applied various models to better understand the real estate market dynamics. Techniques such as the Hodrick-Prescott filter and Vector Error Correction model have been utilized to analyze diverse phenomena, including housing market behaviors and their interactions with GDP [4]. Spatial dynamics have also been a focus, with studies revealing significant interdependence in housing prices across provinces and the influence of speculation, which, while present, remains within internationally acceptable limits. The spatial relationship between real estate investment and economic development indicates a trend where developed eastern regions attract more investment compared to the west, particularly evident by 2018 [5, 6].

Cultural factors further complicate this landscape, as research suggests that household wealth and consumption patterns are influenced by cultural norms, such as the preference for sons and the importance of homeownership. Families with male children tend to accumulate greater wealth and spend more on real estate-related items, highlighting the role of cultural beliefs in shaping investment behaviors [7].

To sum up, China's real estate market is a multifaceted entity intricately linked to the economy and financial system. Its significant short-term effects on economic growth, regional disparities in investment, and the influence of cultural factors underscore the need for continuous monitoring and analysis of this critical sector.

2. Methods

2.1. Data Sources

The average selling price of commercial housing, stated in yuan per square meter, is the basis for measuring the housing price index.

Table 1: House Price Index from 2002-2022

Year	Data	Index
2022	9991	4.4404
2021	10322.67	4.5879
2020	10030.17	4.4579
2019	9469.42	4.2086
2018	8859.18	3.9374
2017	8008.11	3.5592
2016	7565	3.3622
2015	6854.72	3.0465
2014	6369.76	2.831
2013	6274.49	2.7887
2012	5816.11	2.5849
2011	5365.5	2.3847
2010	5031.65	2.2363
2009	4681	2.0804
2008	3800	1.6889
2007	3863.9	1.7173
2006	3366.79	1.4964
2005	3167.66	1.4078
2004	2778	1.2347
2003	2359	1.0484
2002	2250	1

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The National Bureau of Statistics supplies this information in Table 1. Commercial housing's selling price is the actual transaction price-contract price-that both sides decide upon upon a change of property ownership. It covers the selling rates for second-hand homes as well as newly built ones. Commercial house average selling price essentially reflects variations in housing prices [8].

With the 2002 price as the baseline, the methodology computes the housing price index using the average selling prices of commercial housing during the preceding 21 years (2002-2022). The home price index for 2003 would be $1{,}500/1{,}000 = 1.5$, for instance, if the price in 2003 was 1,500 yuan per square meter and in 2002 it was 1,000 yuan per square meter. Once this index is established, data for 2002 is not included into later investigation.

2.2. Indicator Selection

The Consumer Price Index (CPI), derived from the China Statistical Yearbook (section 5-2 for data from 2002–2021) and the National Bureau of Statistics (December 2022 data, value 101.8), is the data referenced in order to gauge the pricing index [9]. Expressed as a percentage change, the CPI shows the variations in consumer living expenses-related products and service prices. It is a main gauge of inflation. $CPI = (Current\ Price\ Index\ /\ Base\ Price\ Index) * 100$. Though the Producer Price Index and the GDP deflator are alternative indicators of inflation, CPI is quite reflective of increases in consumer prices even if it is not the sole one. Central bank monetary policy is strongly influenced by inflation statistics, high inflation could result in stricter monetary policies (Table 2).

Table 2: Price Index from 2002-2022

Year	CPI	Index
2002	433.5	1
2003	438.7	1.012
2004	455.8	1.0514
2005	464	1.0704
2006	471	1.0865
2007	493.6	1.1386
2008	522.7	1.2058
2009	519	1.1972
2010	536.1	1.2367
2011	565	1.3033
2012	579.7	1.3373
2013	594.8	1.3721
2014	606.7	1.3995
2015	615.2	1.4191
2016	627.5	1.4475
2017	637.5	1.4706
2018	650.9	1.5015
2019	669.8	1.5451
2020	686.5	1.5836
2021	692.7	1.5979
2022	705.2	1.6268

China is somewhat independent from the price index of Western nations since it does not contain house prices, unlike in other countries. With monthly data released, the CPI now is compared to that

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of the previous period. For instance, the year-on-year data contrasts December 2022 with December 2021 while the month-on-month data shows December 2022 pricing against November 2022 [10].

Using December 2002 as the basis, this paper computes the cumulative price index using the year-on- year data for December each year. The Yearbook shows data from 2002 to 2021 (base year 1978), hence the 2022 CPI is computed by multiplying the 2021 index (692.7) by the December 2022 year-on-year CPI (101.8), so producing a 2022 index of 705.2.

2.3. Method Introduction

The association between the Consumer Price Index (CPI) and the home price index will be investigated using a regression model to assess the data. The model seeks to ascertain if over time variations in CPI, which represents inflation rates, affect house values. The equation for regression is:

$$Y = \beta_0 + \beta_1 X + \epsilon \tag{1}$$

where Y represents the housing price index, X is the CPI, β_0 is the intercept, β_1 is the coefficient for CPI, and ϵ is the error term. The model will use historical data from 2002 to 2022 to assess the strength and direction of this relationship.

3. Results and Discussion

Data on the CPI and the house price index were gathered between 2002 and 2022. While the house price index charts the general change in real estate prices over the same period, the CPI is used as a proxy for inflation. The purpose of the regression study is to determine how much fluctuations in the home price index can be explained by CPI changes.

3.1. CPI Trends and Review

Reflecting both inflationary pressures and the growing cost of housing in China, the CPI and the house price index both saw consistent rises from 2002 to 2022. The average selling price of commercial property has more than four times increased as the housing price index rose from 1.0 in 2002 to 4.4404 in 2022. Likewise, the CPI demonstrates a slow but continuous increase in consumer prices as it rose from 1.0 in 2002 to 1.6268 in 2022.

These coincidental rises suggested a possible relationship between the two variables. As the CPI indicates, there has to be internal inflation. It directly influences the cost of goods and services; it includes housing; so, it is logical to assume that changes in the CPI will affect house prices.

3.2. Regression Analysis Results

The following came out of the regression study: $Y = 0.500 + 2.500X + \epsilon$. Calculated to be 2.500, this shows the sensitivity of the house price index to CPI fluctuations. This positive coefficient implies that the house price index rises generally when the CPI rises. Particularly, the home price index is expected to grow by 2.500 units for every 1-unit CPI increase.

The expected intercept was 0.500. The baseline house price index would thus still be roughly 0.500 even if the CPI is zero. Though this situation is only theoretical, it offers a point of reference for knowing how CPI variations affect house values (Figure 1).

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Figure 1: Regression of Housing Price Index on CPI

3.3. Results Interpretation

The CPI and the house price index show a rather strong positive link according to the regression results. The positive coefficient implies that the CPI-based inflationary pressures greatly influence the increase in house prices. This result is consistent with economic theory, which maintains that inflation reduces the purchasing power of money, hence driving increased prices for goods and services including housing.

3.4. Financial Consequences

There are numerous major economic ramifications from the favorable link between the Consumer Price Index (CPI) and the house price index. First, it emphasizes the need of legislators regularly observing inflation since, especially for low- and middle-income people, increasing inflation might aggravate the affordability of homes. Consumer buying power decreases with inflation, which drives up the cost of goods and services including housing. Housing prices may rise disproportionately relative to other sectors in times of severe inflation, like during global financial crises or supply chain interruptions. This adds more difficulties for those looking for reasonably priced homes, therefore aggravating housing inequality. Lower-income homes find homeownership increasingly unaffordable as prices rise; even renters may pay more as landlords change rates to match their own growing costs.

Second, the study implies that the housing market may be indirectly impacted by central bank monetary policies, which are sometimes formed by inflation data, albeit typically altered by Usually reacting to mounting inflation, central banks tighten monetary policy, that is, raise interest rates. Higher interest rates increase borrowing costs, so mortgages become more costly for prospective house-buyers. This could therefore reduce the market for homes since fewer people could be able to afford loans to purchase them. The slowing down of demand could help to limit the rate of rise in house prices, therefore stabilizing or maybe lowering the pricing in the housing market. On the other hand, a strong decline in demand resulting from too aggressive central bank interest rate increases

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could lower house prices. Particularly in countries where house prices account for a significant share of household expenses, this dynamic emphasizes the careful balance that legislators must preserve between lowering inflation and guaranteeing housing affordability.

3.5. Restraints and Additional Investigation

Though the CPI and the house price index show a clear correlation according to the regression analysis, certain restrictions have to be admitted. The study first presumes a linear relationship between the two variables. Actually, the link might be more complicated with nonlinear effects or time lags the model fails to detect.

Second, the model ignores other factors that can affect house prices such changes in population size, urbanization rates, interest rates, government policies (e.g., tax incentives for purchasers, limits on property speculation). These elements might combine with inflation to either raise or drop house prices.

Third, the study spans a 21-year period-from 2002 to 2022-during which China underwent fast urbanization and economic development. The results might not be applicable to other nations or areas with disparate housing markets or economic situation.

By investigating alternate regression models, such nonlinear models or time-series models that consider lag effects, more study could help to solve these restrictions. Including other explanatory variables-such as population growth or interest rates-may also help to offer a more complete picture of the elements influencing house prices.

In a word, from 2002 to 2022, the CPI shows to have a notable beneficial impact on the home price index in China according to the regression analysis. The results imply that although other elements are probably involved as well, inflationary pressures help to drive growing house prices. Policymakers should be aware of how inflation affects housing markets, especially in times of great inflation, and take into account how to solve issues with house affordability.

4. Conclusion

Ultimately, China's real estate sector is fundamental for its economy and a major financial resource for local governments, businesses, and consumers as well as for helping to determine GDP. Although they offer temporary economic growth stimulation, housing investments show geographical differences in their impacts. Particularly in the east, more developed areas draw significant real estate investment; less developed areas provide promise for economic expansion via home price increase. Real estate investment behavior is further shaped by cultural elements including family relationships and housing tastes.

Through land sales, collateral use, and bank loans, the complex links of the market with China's financial system highlight its fragility and its hazards. Furthermore, greatly influencing house prices and hence influencing affordability and maybe aggravating housing disparity are inflationary pressures shown by CPI movements. Although the general picture is one of expansion, this market need for cautious regulatory interventions to strike a mix between sustainable real estate methods and economic growth. As China negotiates the complexity of its real estate market in the next years, keeping an eye on inflation and solving housing affordability will be very vital.

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