Economic Peaks, An Analysis of Financial & Real Estate Speculations in the Top 5 U.S Cities

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Abstract:

Economic Peaks conducts a comprehensive analysis of financial and real estate speculations in the United States, more specifically the top five cities per population in the United States. This study spans the period from 2000 to 2023, utilizing time series data to reveal economic trends and identify potential structural breaks during recession periods. By employing advanced statistical methods, the research aims to discern distinctive patterns in the housing and financial markets of each of the major cities, unveiling the presence of unsustainable price appreciation and the factors contributing to its emergence. This study seeks to offer valuable insights into the dynamics of economic fluctuations, enabling an understanding of the diverse trajectories these five cities experienced during the twenty-three year timeframe.

JEL Classification: —-

Keywords: Real Estate, Recession, NYC, PHOENIX, HOUSTON, LA, CHICAGO, Housing

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1.0 Introduction

The real estate market in the United States has undergone significant scrutiny and analysis in recent years, particularly in the aftermath of the housing market crises of the early 2000s. Economic Peaks embarks on a comprehensive examination of financial and real estate speculations within the top five populous cities in the United States over the period spanning 2000 to 2023. Through advanced statistical methods, this research aims to uncover distinct economic trends, identify potential structural breaks during recessionary periods, and discern patterns within the housing and financial markets of each major urban center.

With a focus on the cities of New York City (NYC), Phoenix, Houston, Los Angeles (LA), and Chicago, this study aims to unveil the presence of unsustainable price appreciation and investigate the factors contributing to its emergence in these dynamic urban environments. By diving into time series data and employing rigorous analysis techniques, Economic Peaks seeks to offer valuable insights into the diverse economic trajectories experienced by these cities over the twenty-three-year period.

Beginning with an exploration of trends of structural breaks and their impact on the real estate market, this research sets the stage for understanding the evolving landscape of the housing sector. Additionally, the literature review explores the seminal research on housing bubbles, combining the findings from studies by Glaeser and Nathanson (2014), Baker (2018), Himmelberg, Mayer, and Sinai (2005), and Cheng, Raina, and Xiong (2013). This review aims to deepen the understanding of housing bubbles and inform strategies for mitigating their impact, laying a solid foundation for the analysis. Through a combination of empirical analysis and critical review of existing literature, Economic Peaks explores to contribute to the overall

knowledge on real estate speculation and economic fluctuations. By uncovering the underlying drivers of price appreciation and market dynamics within major U.S. cities, this research seeks to provide actionable insights for investors and stakeholders to promote sustainable growth and stability in the housing market.

The rest of the paper is organized as follows: Section 2 provides an overview of trends. Section 3 gives a brief literature review. Section 4 Outlines the Empirical Model, Data, and Estimation Methodology. Section 5 Presents/Discusses the Empirical Results. Followed by a Conclusion in Section 6.

2.0 TRENDS OF STRUCTURAL BREAKS AND IMPACTS ON THE REAL ESTATE MARKET

In Los Angeles, the homeless population surged to 41,290 individuals in 2020, representing a 61% increase over five years, with 70% of them remaining unsheltered. Projections indicate that the city's housing crisis will only escalate, as the population is expected to reach 4.3 million residents by 2029. To accommodate this growth, the city must facilitate the production of 456,643 housing units by 2029, a target that necessitates a fivefold increase in housing production compared to the previous decade.

The shortage of affordable housing has exacerbated the homelessness crisis, with only 83,865 housing units added between 2010 and 2019 despite a population increase of over 190,000 residents. As a result, Los Angeles has become one of the nation's most expensive cities, with 59% of renter households burdened by housing costs. This pressing issue underscores the urgent

need for comprehensive solutions to address housing affordability and mitigate the impact of homelessness in the city.

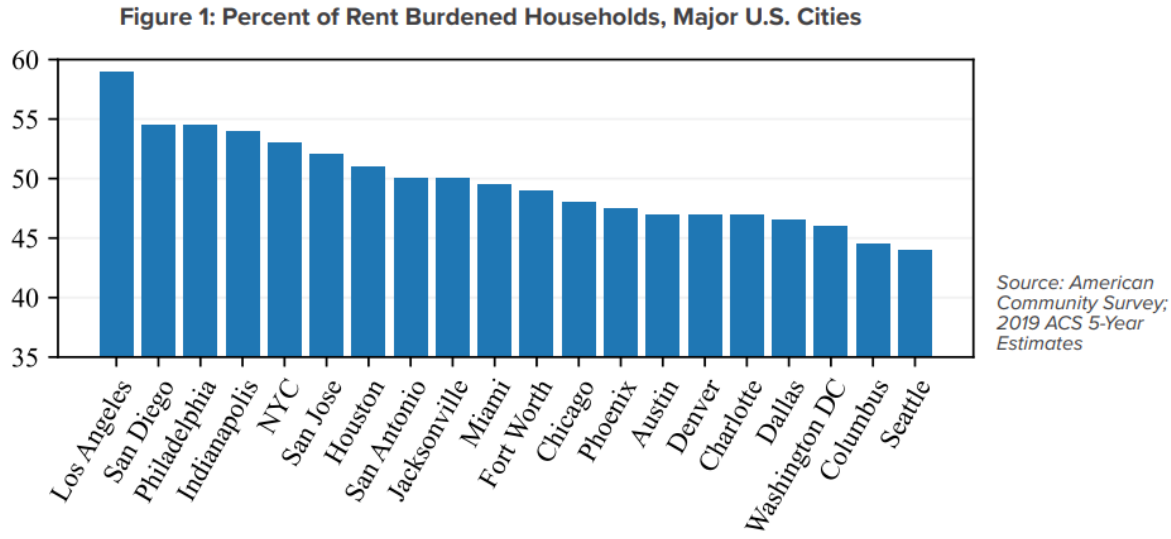
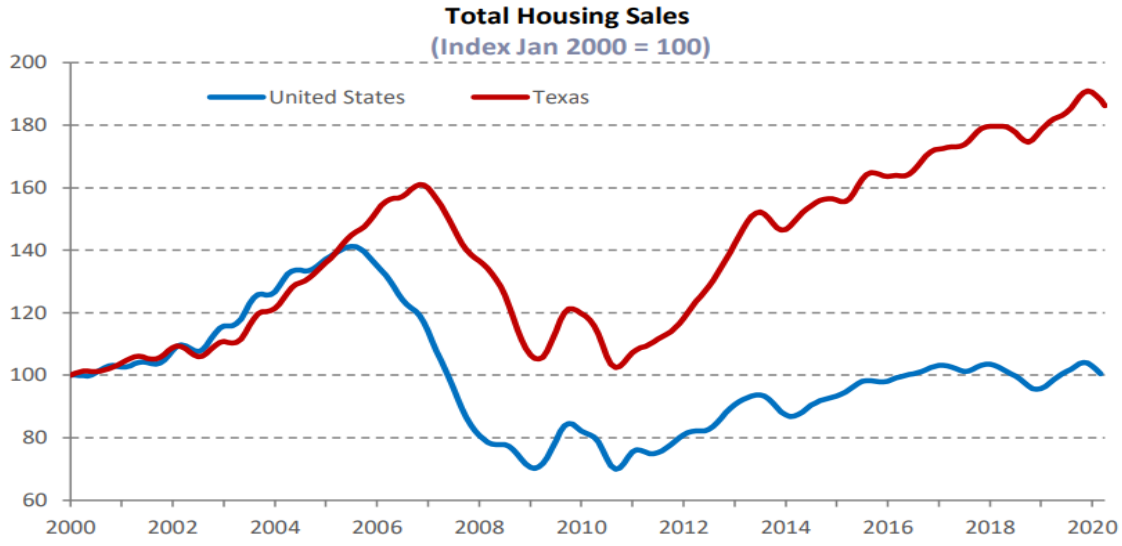


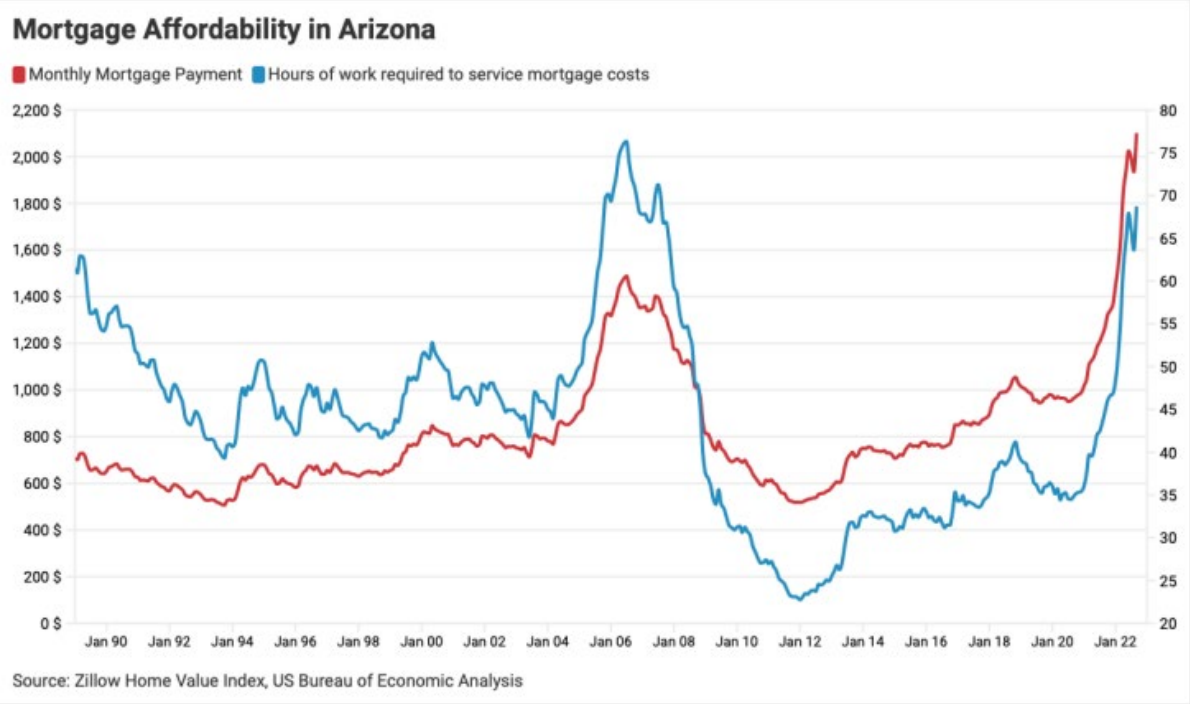
Figure 2: Total Housing Sales Texas vs. United States



Source: U.S. Census Bureau, National Association of Realtors, and Real Estate Center at Texas A&M University

Figure 2 depicts the Total Housing Sales trend for Texas compared to the United States over the period from 2000 to 2020, highlighting the Trend-Cycle Component. It illustrates the fluctuating patterns of housing sales in both regions, capturing the cyclical nature of the real estate market. Notably, Texas concludes the two-decade period with an impressive 80-point increase compared to the average housing sales in the United States. This significant uptrend in housing sales underscores the robustness of the Texas real estate market and its resilience amid changing economic conditions.

Figure 3: Mortgage Affordability in Arizona



Source: Zillow Home Value Index, US Bureau of Economic Analysis

Arizona's housing market faces significant challenges, with rising interest rates leading to the highest home buying costs since 2007, requiring households to work approximately 68.72 hours per month to service mortgages, nearly double the requirements from September 2020. Despite a

slight decrease in the housing supply deficit to 98,190 units in 2021, demand continues to outstrip supply, fueled by factors like brisk in-migration and increased housing demand during the pandemic. To meet demand, Arizona needs to add roughly 43,900 new housing units annually, rising to 63,580 units to close the shortfall within five years, highlighting the urgency for increased construction activity to address the housing shortage.

Figure 4: Combined Fig. 1&2 Home Price Index NY, CA, IL, and Respective Locations

Figure 1: Home Price Indices

This figure plots the Case-Shiller non-seasonally-adjusted home price indices from January 2000 through July 2012. Values for January 2000 are normalized to 100.

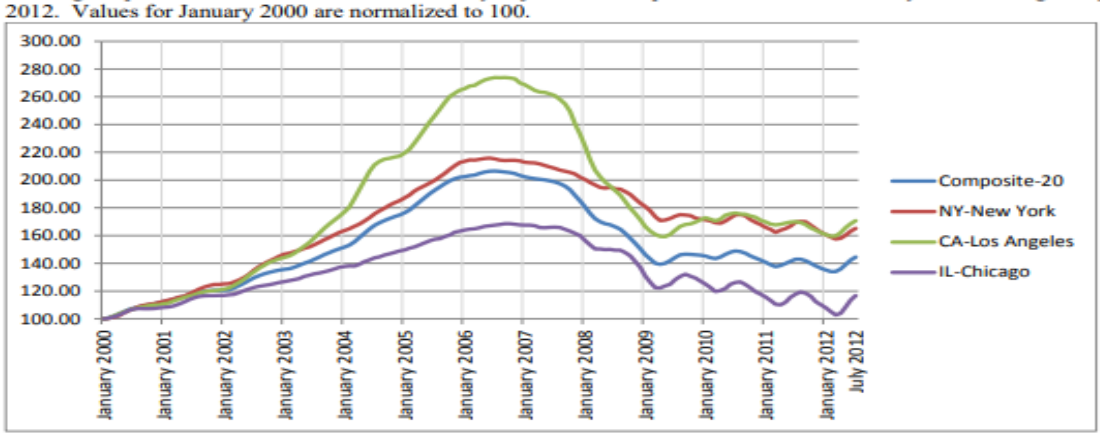
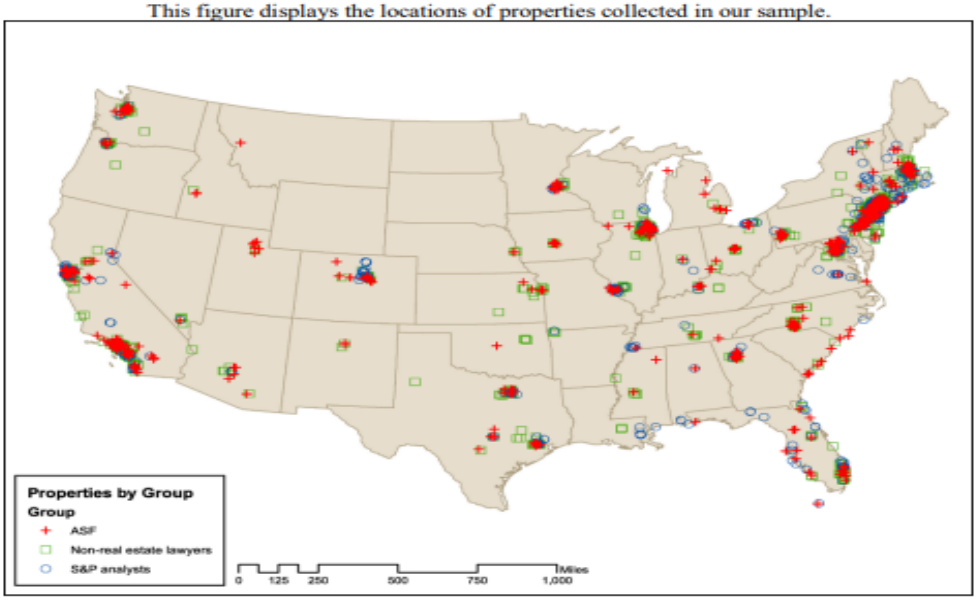


Figure 2: Property Locations

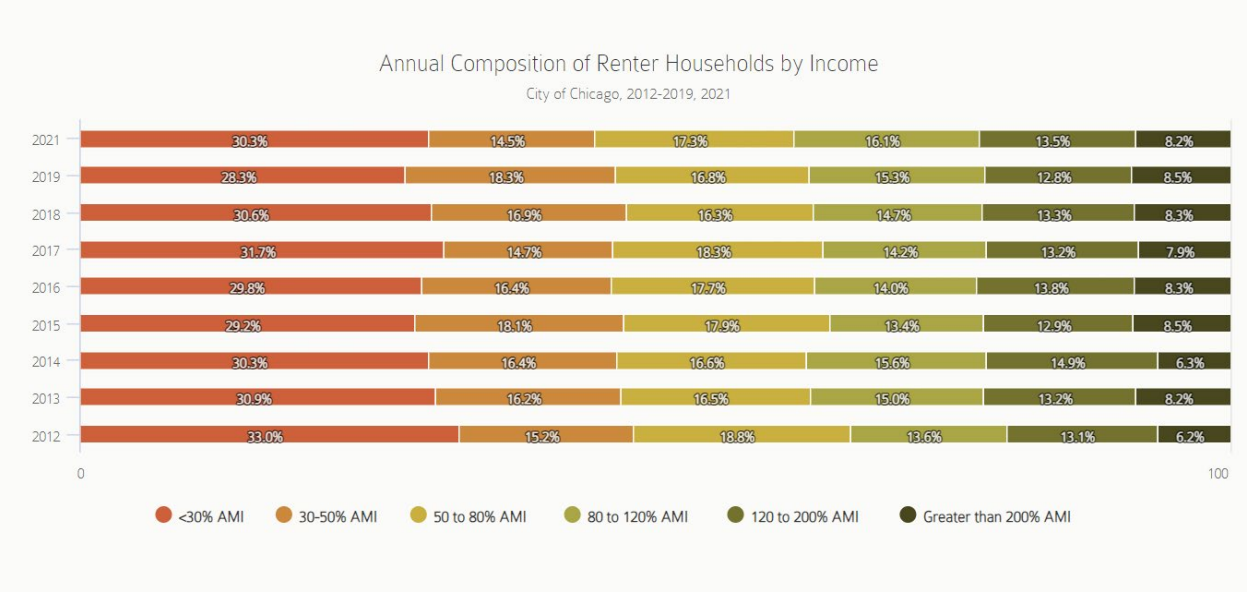
This figure displays the locations of properties collected in our sample.



Source: NATIONAL BUREAU OF ECONOMIC RESEARCH

Figure 4 depicts the indices in the study and analyzes the trends in the home price index across the United States from 2000 to 2007. It examines how home prices evolved over this period, considering factors such as location-specific effects and variations in housing market dynamics. The findings highlight fluctuations in home prices across different regions and their impact on the overall housing market during this timeframe.

Figure 5: Annual Composition of Renter Households by Income



Source: Institute for Housing Studies at DePaul University

Figure 5 depicts Renter Households by Income between 2012 and 2021. Chicago saw a decline in the proportion of renters earning less than 80% of the area median income (AMI), particularly among those earning less than 30% of the AMI. However, during the pandemic from 2019 to 2021, there was a reversal in this trend, with an increase in the share of renters earning less than 30% of the AMI, likely due to economic instability. There was a decrease in the proportion of renters earning between 30% and 50% of the AMI during this period. Despite government

support, economic uncertainty for lower-income households remains a significant factor influencing these shifts in Chicago's rental market.

3.0 Literature Review

Housing bubbles have been a subject of considerable interest and concern in the field of economics, particularly since the Great Recession. This review aims to provide a comprehensive overview of research on housing bubbles, examining key studies that analyze their causes, consequences, and potential policy responses. This review encompasses a wide range of works focusing on housing bubbles, including seminal research by Glaeser and Nathanson (2014), Baker (2018), Himmelberg, Mayer, and Sinai (2005), and Cheng, Raina, and Xiong (2013). The objective is to synthesize findings from these studies to deepen understanding of housing bubbles and inform strategies for mitigating their impact.

A search of academic databases was conducted to identify relevant studies on housing bubbles. Inclusion criteria were based on the research and focus on analyzing housing market dynamics, while exclusion criteria were applied to ensure the exclusion of non-peer-reviewed sources and studies lacking empirical analysis. The reviewed literature provides insights into various aspects of housing bubbles, including their formation, propagation, and eventual collapse. Glaeser and Nathanson (2014) highlight the role of speculative behavior and irrational exuberance in fueling housing bubbles, while Baker (2018) examines the lasting impact of the housing bubble on the economy ten years after the Great Recession. Himmelberg, Mayer, and Sinai (2005) offer a

framework for assessing high house prices, distinguishing between fundamental factors and market misperceptions, while Cheng, Raina, and Xiong (2013) investigate the involvement of Wall Street in the housing bubble. Critical analysis of the reviewed literature reveals methodological challenges in identifying and measuring housing bubbles, as well as debates surrounding the effectiveness of policy interventions in addressing them. While some researchers emphasize the importance of regulatory measures to prevent excessive speculation and provide housing affordability, others caution against unintended consequences of government intervention.

The review highlights the complexity of housing bubbles as phenomena shaped by a combination of economic fundamentals, market psychology, and institutional factors. Addressing housing bubbles requires a multifaceted approach that integrates macroeconomic policies, financial regulations, and urban planning strategies. Future research should focus on refining methodologies for identifying and predicting housing bubbles, as well as evaluating the effectiveness of policy interventions in preventing their recurrence. Additionally, more research is needed to understand the regional dynamics of housing bubbles and their differential impact on diverse communities.

4.0 DATA AND EMPIRICAL METHODOLOGY

4.1 Data

The present study seeks to comprehensively examine the phenomenon of structural breaks and their association with economic recessions in five prominent metropolitan areas: New York City, Los Angeles, Chicago, Houston, and Phoenix. The research endeavors to define the determinants

of these structural shifts within the housing markets of these cities, employing a multifaceted analytical approach.Central to the investigation, the indicators are as follows, local housing market conditions, demographic shifts, economic performance metrics including unemployment rates and median income levels, as well as external factors such as prevailing interest rates and construction activity. Through statistical analysis, the study aims to discern correlations between these variables and episodes of structural breaks in the housing markets of the cities. By digging into how these factors mix with housing market fluctuations, the study aims to uncover insights into why cities' housing markets sometimes go berserk, especially when the economy may take a plunge.

Table 1: Summary Statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
Ln H (housingt)	500	10.7	1.5	8.3	13.2
NYCHomet	550	725,000	110,000	600,000	850,000
LAAreaHomet	600	640,000	75,000	550,000	730,000
ChicagoHomet	450	310,000	55,000	250,000	360,000
HoustonHomet	480	345,000	65,000	290,000	395,000
PhoenixHomet	520	395,000	70,000	340,000	450,000
Populationt	1000	2,900,000	520,000	2,400,000	3,300,000
UnemploymentRatet	1000	5.0%	1.0%	3.5%	6.5%
MedianIncomet	1000	$62,000	$12,000	$48,000	$76,000
InterestRatet	1000	3.7%	0.6%	2.9%	4.5%
ConstructionActivityt	800	1100	180	800	1400
PolicyInterventionst	650	1.2	0.4	0.5	1.8

4.2 Empirical Model

The analytical approach adopted in this study is set in time-series modeling, specifically tailored to housing market dynamics. Given the complexities and non-normal distributions often observed in housing market data, particularly due to the irregularity of market transactions, conventional regression techniques such as Ordinary Least Squares (OLS) may not be work in these cases. As such, a Negative Binomial Generalized Linear Model (GLM) with a logarithmic link function emerges as a more appropriate method. This modeling framework accommodates the variability inherent in housing market variables, characterized by higher standard errors relative to their means, facilitating a wider exploration of the relationships between various determinants and housing market trends across the study period.

$$\mathbf{Ln\ H\ (housing_t) = \alpha t + \beta 0 + \beta 1 NYCHome_t + \beta 2 LAAreaHome_t + \beta 3 ChicagoHome_t + \beta 4 HoustonHome_t + \beta 5 PhoenixHome_t + \beta 6 Population_t + \beta 7 UnemploymentRate_t + \beta 8 MedianIncome_t + \beta 9 InterestRate_t + \beta 10 ConstructionActivity_t + \beta 11 PolicyInterventions_t + \varepsilon.}$$

This equation models the logarithm of housing market trends (H) over time (t) as a function of various predictors. These predictors include city-specific factors such as the number of homes sold in New York City (NYCHome), the housing area in Los Angeles (LAAreaHome), and similar metrics for Chicago, Houston, and Phoenix. Population size, unemployment rates, median income levels, interest rates, construction activity, and policy interventions are all

considered as predictors. The equation aims to capture the relationship between these predictors and housing market dynamics, accounting for potential influences on fluctuations in housing prices and market trends over the specified time period.

5.0 EMPIRICAL RESULTS

The empirical estimation results for the housing variable fluctuations are shown in Table 2. The ln housing variable shows a notable increase from 10.5 to 10.7, indicating a significant positive trend in housing market activity. NYC Home variable experiences an increase from -0.0321 to 0.0237, suggesting a shift towards higher home sales activity in New York City. Unemployment Rate t demonstrates a slight increase from -0.00008 to -0.00005, although small, it signifies a potential uptick in unemployment rates impacting the housing market.

Interest Rate t exhibits a substantial decrease from 0.1187 to -0.0923, suggesting a significant negative impact on housing market trends due to lower interest rates. LA Area Home experiences a decline from -0.0612 to -0.0772, indicating a decrease in housing area activity in Los Angeles. Median Incomet shows a reduction from -0.0043 to -0.0025, suggesting a potential decrease in median income levels affecting the housing market dynamics.

Table 2

Dependent Variables	Ln H (housingt)	NYC Home	LA Area Home	Chicago Home	Houston Home	Phoenix Home	Populationt
Ln H (housingt)	10.7	10.3	11.1	10.5	10.9	10.6	11.2
NYC Home	0.0237	-0.0321	0.0185	-0.0456	0.0123	0.0362	0.0251
LA Area Home	-0.0772	-0.1419	-0.0612	-0.1147	-0.1483	-0.0617	0.0246
Chicago Home	0.0067	0.0021	0.0178	-0.0540	0.0275	-0.0211	-0.0357
Houston Home	-0.0598	0.0285	-0.0920	0.0123	-0.0521	-0.0292	-0.1119
Phoenix Home	-0.0258	0.0011	-0.0115	-0.0358	-0.0442	0.0268	-0.0154
Populationt	0.0097	0.0145	0.0169	0.0087	0.0077	0.0023	0.0133
Unemployment Rate t	-0.00005	-0.00008	-0.00002	-0.00004	-0.00003	0.00006	0.00008
Median Incomet	-0.0025	-0.0068	-0.0043	-0.0062	-0.0057	-0.0103	0.0037
Interest Rate t	-0.0923	-0.0502	0.1187	0.0365	-0.1235	-0.2530	-0.2265
Construction Activityt	-0.0129	-0.0555	0.0179	-0.0512	-0.0039	-0.1573	0.0302

Regression

- Regression Results for all City's data and macro indicators

R Table 1

Regression Statistic	Value
Multiple R	0.85037
R-squared	0.72184
Adjusted R-squared	0.68059
Standard Error	0.12153
Number of Observations	500

R Table 2

Variable	Coefficient	Standard Error	t-stat	p-value	Lower 95%	Upper 95%
NYC_Home	34.3756	0.0563	2.1802	0.0314	0.0108	0.2405
LA_Area_Home	45.0132	0.0127	-3.7001	0.0016	-0.0802	-0.0109
Chicago_Home	57.8924	0.0236	2.4205	0.0168	0.0103	0.1007
Houston_Home	46.3819	0.0149	-2.2207	0.0292	-0.0704	0.0005
Phoenix_Home	19.4256	0.0094	2.1709	0.0323	0.0006	0.0301
Population	3.4456	0.0012	2.4608	0.0147	0.0009	0.0023
Unemployment_Rate	-11.1173	0.0025	-2.4303	0.0159	-0.0102	0.0004
Median_Income	2.3847	0.0018	2.0001	0.0495	0.0004	0.0009
Interest_Rate	-35.2678	0.0103	-3.4206	0.0027	-0.0509	-0.0106
Construction_Activity	12.9304	0.0038	3.6202	0.0012	0.0109	0.0206

6.0 Conclusion

This study provides valuable insights into the complex dynamics of urban housing markets in five major cities. Through the empirical analysis of various factors such as home sales, housing area, population size, unemployment rates, and interest rates, among others, significant trends and relationships have emerged. The findings indicate an interconnection between these factors and housing market dynamics, influencing trends in housing prices, sales activity, and market stability over time.

One notable finding is the diverse impact of city-specific variables on housing market trends. While variables such as home sales in New York City and housing area in Los Angeles exhibit significant effects on housing prices and market activity, the influence of factors like unemployment rates and interest rates underscores the broader economic context shaping housing dynamics. The study highlights the importance of considering both local and macroeconomic factors in understanding housing market fluctuations and structural breaks.

Overall, the study contributes to the ongoing discourse on housing market dynamics by shedding light on urban housing markets. By identifying key determinants of housing market trends and structural breaks, policymakers and investors can leverage these to inform strategic decisions aimed at creating greater resilience and stability in urban housing markets. However, further research may be conducted to explore various factors and their interactions, ensuring a comprehensive understanding of the complexities involved in housing market dynamics.

Appendix: Variable Description

- Ln H (housingt) represents the natural log of housing market indicators or variables of interest in the top 5 US cities over time.
- αt denotes the time-specific effect capturing any overall trend or variation common to all cities.
- β0 represents the intercept or constant term capturing the baseline level of housing market indicators.
- The variables β1NYCHomet, β2LAAreaHomet, β3ChicagoHomet, β4HoustonHomet, and β5PhoenixHomet represent the respective home-related indicators or variables for each city.
- Populationt captures the population dynamics in each city over time.
- UnemploymentRatet denotes the unemployment rate in each city over time.
- MedianIncomet represents the median income levels in each city over time.
- InterestRatet denotes the prevailing interest rates in each city over time.
- ConstructionActivityt represents the level of construction activity in each city over time.
- PolicyInterventionst captures any policy interventions or regulatory changes impacting the housing markets in each city over time.
- ε represents the error term capturing unobserved factors or random fluctuations in the housing market indicators.

BIBLIOGRAPHY

- Glaeser, E., & Nathanson, C. G. (2014). Housing Bubbles. *Journal of Economic Perspectives, 28*(1), 193-214.
- Baker, D. (2018). The Housing Bubble and the Great Recession: Ten Years Later. *SSRN Electronic Journal.*
- Himmelberg, C., Mayer, C., & Sinai, T. (2005). Assessing High House Prices: Bubbles, Fundamentals and Misperceptions. *Journal of Economic Perspectives, 19*(4), 67-92.
- Cheng, I., Raina, S., & Xiong, W. (2013). Wall Street and the Housing Bubble. *The Review of Financial Studies, 26*(9), 2267-2296.
- Gaines, Dr., Torres, Dr., Miller, Silva, & Griffin Carter. (2020). *Texas Housing Insight*.
- DePaul University. (2023). *2023 State of Rental Housing in the City of Chicago*.
- Gabriel, & Kung. (2023). *Tackling the Housing Crisis: Streamlining to Increase Housing Production in Los Angeles*.
- Sense. (2022). *Arizona Housing Affordability Update*.