

*Differences in Housing Vacancy Rates across Major Cities Worldwide**

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Abstract: To reveal the characteristics and patterns of housing vacancy rate (HVR) disparities across major cities worldwide, this study integrated multi-source data (academic literature, statistical data, research reports, etc.) to collect and analyze HVR data from 324 sample cities across 45 countries. The results indicate that: (1) The median HVR for global cities is 8.04%, showing a pattern of "lower in the North, higher in the South," with developed countries generally having lower rates than developing countries. (2) Low HVR cities (<5%) account for 36.73% of the sample, predominantly concentrated in Europe and Oceania; cities with extremely high HVR ($\geq 20\%$) are concentrated in countries like Mexico, India, and Greece. (3) Significant intercontinental differences exist, with the median and mean HVRs in Asia and Africa exceeding 10%, far higher than those in Oceania, Europe, and North America. (4) Among 41 selected globally renowned cities, HVRs vary significantly, with 13 cities exceeding the 10% international alert threshold. This study provides foundational data and support for analyzing global urban housing vacancy.

1. Introduction

Urban housing vacancy has emerged as a new global challenge and a significant topic of interest in international academia. Long-term housing vacancy (distinct from seasonal vacancy) serves as a key indicator for measuring housing market oversupply or insufficient demand[1-2], and its spatial distribution and evolutionary trends are attracting increasing attention. International studies show this phenomenon is common in regions undergoing structural transformation: the US has experienced historically high long-term vacancy rates in recent years, with population loss and weak demand leading to prominent vacancies in inner cities and declining suburbs (especially the "Rust Belt")[1,3]; Eastern Germany faces severe vacancy issues in cities (particularly old urban areas) due to population decline and deindustrialization [4]; similarly, shrinking cities in the UK (e.g., Liverpool) also experience vacancy due to insufficient demand[5]. The situation is particularly notable in East Asian countries: Japan's vacancy rate continues to rise, driven primarily by population decline, aging, and a consumer culture favouring new homes (stimulating new supply and exacerbating long-term vacancy and circulation difficulties for existing homes) [6-7]; South Korea has a vast number of abandoned houses (nearly one million units in 2015), with manufacturing decline, economic downturn, aging, lack of demand for old small-sized units, and government new town policies

exacerbating vacancy issues in non-capital regions and central areas of cities like Incheon [8-9]. In China, housing vacancy problems are more severe in small, medium-sized, and third- or fourth-tier cities, with some exhibiting "ghost town" or "empty city" phenomena[10-11].

Despite housing vacancy issues in many cities worldwide, there remains a lack of comprehensive compilation and exploration of HVR disparities across all continents and major countries' key cities at the global level. To gain a more comprehensive and profound understanding of HVRs in major global cities and facilitate international comparison, this study compiles and collects HVR data for major global cities and analyzes their differential characteristics, providing foundational reference and support for further research on global urban housing vacancy.

2. Study Area and Data Sources

As there is currently no convincing global dataset on HVR for countries or cities, the housing vacancy data for this study were collected from various sources, including published papers, statistical data and bulletins, institutional research reports, media reports, etc., prioritizing data on long-term vacancy. Data primarily from 2020 or nearby years were used, covering the period 2010-2024. The sample includes 324 cities across 45 countries. China has the largest number of sample cities (53), while Ethiopia, Ghana, Zimbabwe, Côte d'Ivoire, Kenya, Mali, Senegal, Tanzania, Tunisia, Uganda, Zambia, Argentina, Finland, United Arab Emirates, Thailand, and Singapore each have only one sample city. The detailed distribution of sample cities by continent and country is shown in Table 1.

Table 1 Distribution of sample cities by continent and country

Continent	Number of Sample Cities	Countries Included
Asia	100	China, Japan, South Korea, India, Thailand, Malaysia, Singapore, United Arab Emirates
Europe	110	UK, France, Germany, Italy, Spain, Portugal, Netherlands, Switzerland, Greece, Finland, Denmark, Sweden, Norway, Poland, Romania
Africa	25	South Africa, Egypt, Ethiopia, Ghana, Zimbabwe, Côte d'Ivoire, Kenya, Mali, Senegal, Tanzania, Tunisia, Uganda, Zambia, Morocco, Nigeria
Oceania	10	Australia, New Zealand
North America	68	USA, Canada, Mexico
South America	11	Brazil, Argentina

3. Results and Analysis

3.1. Overall Situation of Housing Vacancy in Global Major Cities

Based on HVR data from 324 sample cities worldwide, the median HVR for global major cities is 8.04%, and the arithmetic mean is 9.92%. Overall, global urban HVR exhibits a pattern of "lower in the North, higher in the South"; developed countries generally have lower HVRs than developing countries. The distribution of HVRs across the 324 sample cities is visualized in Figure 1.

Using thresholds of 5%, 10%, and 20%, cities were categorized into four HVR intervals: low vacancy cities (0%-4.99%), medium vacancy cities (5.00%-9.99%), high vacancy cities (10%-19.99%), and extremely high vacancy cities ($\geq 20\%$). There are 119 low vacancy cities, accounting for 36.73% of the sample, mainly concentrated in Europe and Oceania, indicating mature markets and relatively balanced housing supply and demand in these regions (mostly developed countries). Cities with extremely high HVR are concentrated in countries like Mexico, India, and Greece, reflecting economic fluctuations or issues of excessive housing development.

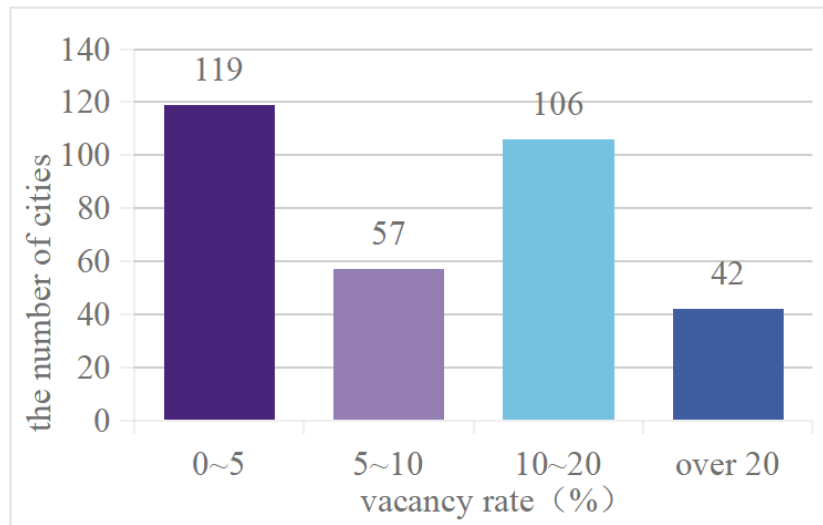


Figure 1 Histogram of housing vacancy rate distribution for the 324 global sample cities

3.2. Housing Vacancy in Sample Cities by Country

The median housing vacancy rates and the number of sample cities for each country are summarized in Table 2. The statistics reveal significant disparities in HVR at the national level.

Table 2 Median housing vacancy rate and number of sample cities by country

Country	Number of Sample Cities	Median Vacancy Rate (%)	Country	Number of Sample Cities	Median Vacancy Rate (%)	Country	Number of Sample Cities	Median Vacancy Rate (%)
Greece	3	28.20	South Africa	5	12.90	Portugal	4	6.91
Zimbabwe	1	22.50	Spain	17	12.61	New Zealand	3	6.60
Mexico	12	20.24	Tanzania	1	12.50	Kenya	1	6.00
Nigeria	2	20.00	United States	23	11.26	Norway	5	6.00
Malaysia	8	19.90	Romania	3	11.10	Finland	1	5.40
Ghana	1	17.50	Ethiopia	1	11.00	Denmark	2	4.65
Mali	1	17.50	Côte d'Ivoire	1	11.00	Sweden	2	3.53
India	13	17.50	Uganda	1	11.00	Netherlands	4	3.10
Zambia	1	16.50	Poland	4	9.80	United Kingdom	20	2.80
China	53	16.00	Brazil	10	9.00	Canada	33	1.50
Egypt	5	15.00	France	4	8.20	Australia	7	1.28
Argentina	1	14.25	Singapore	1	8.10	Germany	11	1.20
Japan	12	14.10	United Arab Emirates	1	8.00	South Korea	11	0.95
Senegal	1	13.50	Morocco	2	8.00	Switzerland	10	0.78
Thailand	1	13.30	Tunisia	1	7.00	Italy	20	0.30

The variation and distribution of HVRs across continents are further illustrated by the box plot in Figure 2. In Europe, Germany and Switzerland have very low vacancy rates, but Greece's mean is elevated due to its economic crisis. Specifically, Athens (31%) and Thessaloniki (28.2%) exhibit extremely high vacancy rates, partly due to unsold properties or disinvestment caused by economic recession. In Asia, developing countries like China and India experience supply-demand imbalances due to rapid urbanization. Gurgaon (35.9%) and Delhi (26%) in India have notably high vacancy rates. In Africa, Egypt (median 15%) and Nigeria (median 20%) also show relatively high rates. In North America, Canada's market is relatively healthy and balanced, while some cities in Mexico face issues of excessive real estate development, with Huehuetoca's vacancy rate reaching 44.95%.

3.3. Housing Vacancy by Continent

Urban HVRs differ markedly across continents (Table 3). The median and mean HVRs in Asia and Africa both exceed 10%, indicating generally high vacancy rates. In contrast, the median HVRs in Oceania, Europe, and North America are below 5%, indicating low vacancy levels, though the arithmetic mean for North America reaches 9%. Overall, the arithmetic mean HVR is greater than the median HVR for each continent, indicating a right-skewed (positively skewed) distribution, meaning a few cities with relatively high HVRs (outliers) pull the average upwards. The variation and distribution of HVRs across continents are further illustrated by the box plot in Figure 2.

Table 3 Median and arithmetic mean housing vacancy rates by continent

Continent	No. of Sample Cities	Median HVR (%)	Mean HVR (%)
Asia	100	15.00	15.04
Europe	110	3.13	5.67
Africa	25	12.90	14.00
Oceania	10	1.59	2.73
North America	68	4.87	9.00
South America	11	9.00	9.35
Global	324	8.04	9.92

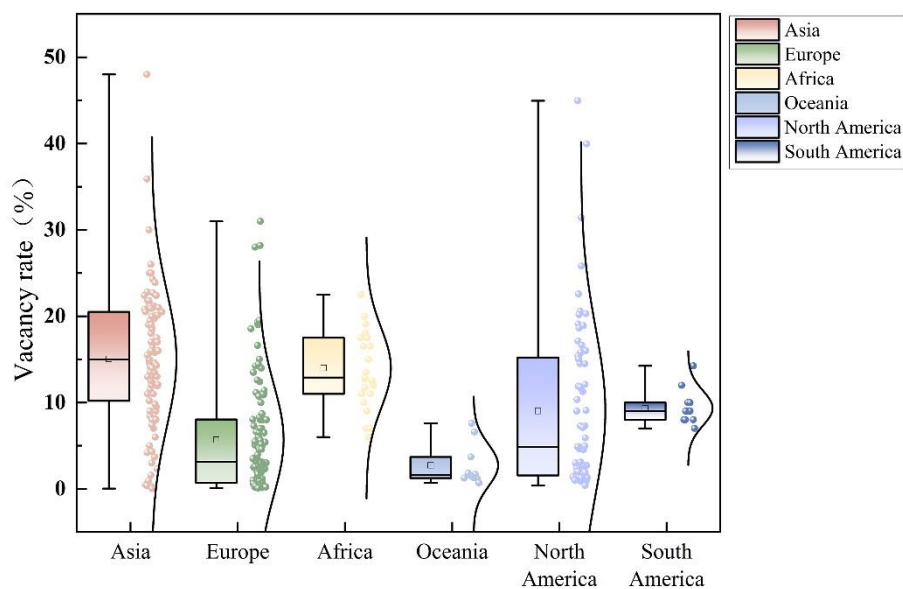


Figure 2 Box plot of housing vacancy rates for sample cities by continent

3.4. Housing Vacancy in Globally Renowned Cities

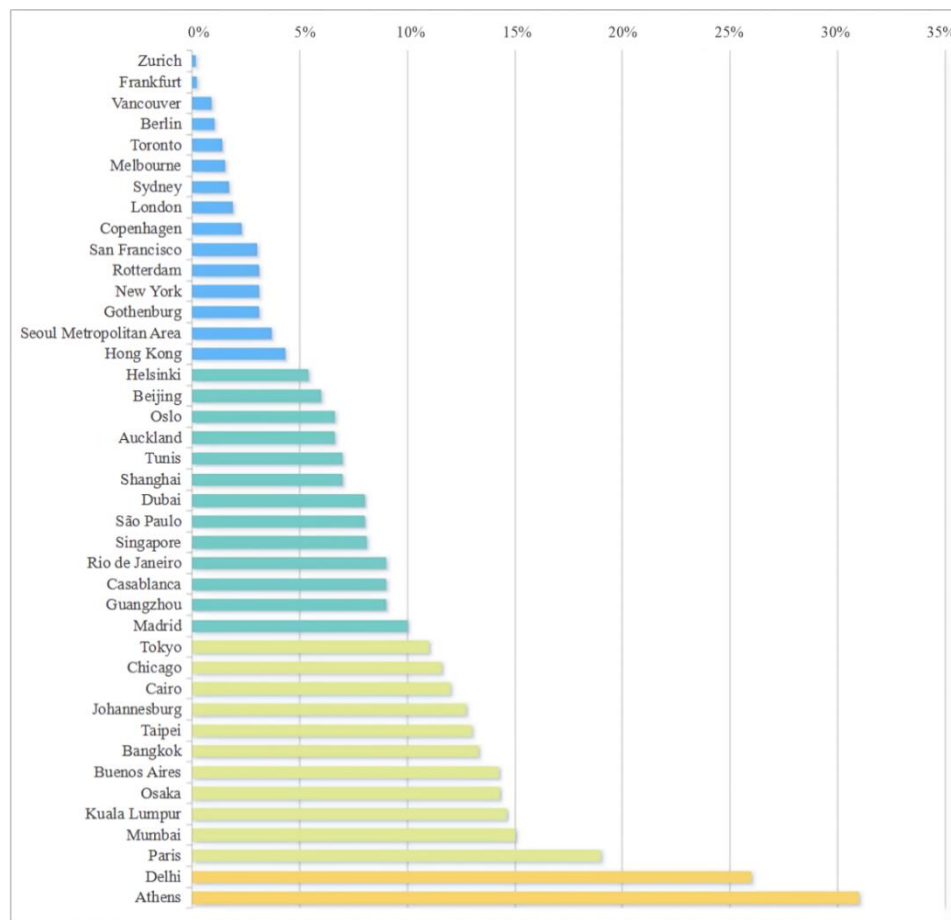


Figure 3 Ranking of housing vacancy rates for 41 globally renowned cities

From the 324 sample cities, 41 globally renowned cities were selected. A bar chart ranking their HVRs from low to high is shown in Figure 3. HVRs among these famous cities vary extremely. Zurich (0.15%) and Frankfurt (0.20%) have the lowest HVRs among these 41 cities, while Athens and Delhi have very high HVRs of 31% and 26%, respectively. Overall, 13 cities have HVRs exceeding the 10% international alert threshold (Figure 3).

4. Conclusion and Recommendations

HVRs differ significantly across global cities, with both high and low vacancy cities coexisting. Overall, cities in the "Global South" tend to have higher HVRs than those in the "Global North." Urban HVRs are relatively high in Asia and Africa, and generally low in Oceania and Europe. These disparities are related to various factors such as the cities' development stages, socio-economic characteristics, population in-/out-migration, demographic changes, housing supply conditions, and real estate market trends.

Drawing on existing research and the findings of this study, the following measures could be adopted to reduce HVR in cities or regions with high vacancy: Firstly, subsidize the demolition and reconstruction of vacant housing. Secondly, governments could expropriate vacant properties through laws and regulations for alternative uses, such as converting them into markets, sports grounds, or other temporary facilities. Thirdly, local governments should actively attract residents by increasing job opportunities, introducing high-quality public services, and implementing social policies, thereby

boosting housing demand. Fourthly, governments should suspend the supply of residential land and new housing construction in existing high-vacancy areas. Fifthly, governments should enhance the residential appeal of vacant housing and reintroduce it to the market through community revitalization and public transportation improvements. Sixthly, governments should implement a vacant housing tax to discourage vacancy.

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