

# Spatial Pattern of Housing Sales Vacancy in Guangzhou's Urban District, China

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**Abstract:** Housing vacancy can reflect the destocking degree of the real estate market. Based on the data of 57 opened residential quarters (46,622 units) from 2015 to 2018, this paper constructs a calculation formula of the sales vacancy rate and then analyzes the spatial pattern in Guangzhou's urban district. The results show that there is obvious differentiation in the spatial pattern of housing sales vacancy in Guangzhou's urban district, showing a higher spatial pattern in the old area and urban district and a lower spatial pattern in the core area. Subdistricts with high vacancy rates are mainly located in the east of the old area, the south and east of the urban district and near Baiyun Mountain in the north.

**Keywords:** Housing vacancy; Sales vacancy; Guangzhou's urban district; Spatial pattern

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## 1. Introduction

The subject of home vacancy has gotten a lot of attention in recent years. Scholars have analyzed the housing vacancy pattern in different cities using nighttime light data <sup>[1]</sup>, geographic national conditions monitoring data <sup>[2]</sup>, power consumption data <sup>[3]</sup>, municipal water consumption data <sup>[4]</sup>, and other data, and have observed different vacancy pattern characteristics, but most cities show the characteristic that the central urban area is constantly extending to the outer suburbs <sup>[2,5]</sup>. However, there is currently no research on the sales vacancy pattern in China or elsewhere.

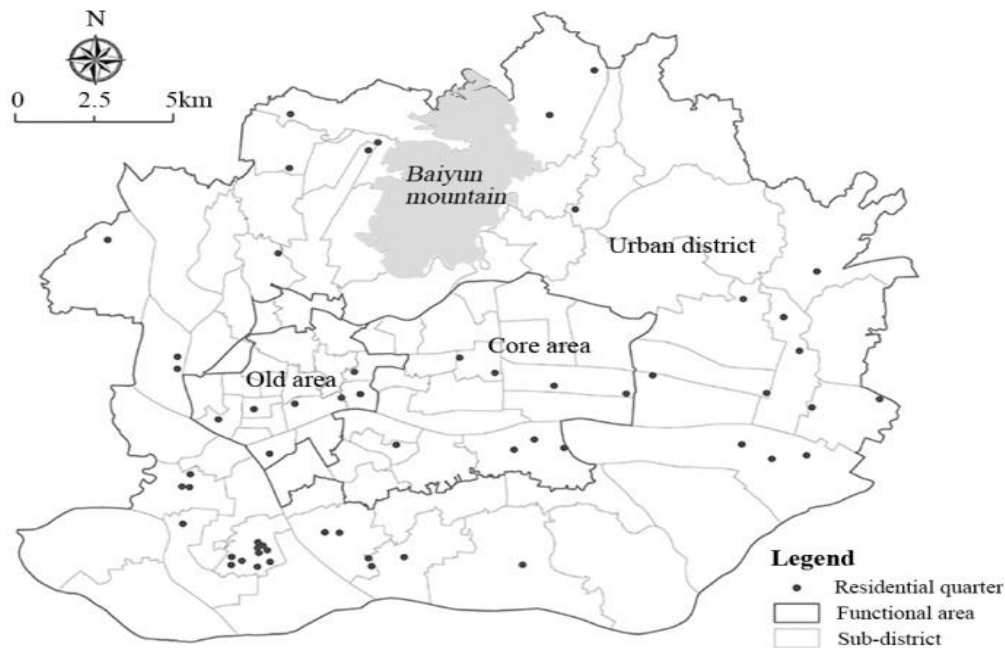
This work builds on domestic and international housing vacancy research and experimentally studies the spatial pattern of home sales vacancy in Guangzhou's urban district. This paper examines the spatial distribution pattern of sales vacancy of opened residential quarters using data from opened residential quarters as the research object, which can help concerned departments propose effective solutions based on the vacancy rate in different regions, rationally regulate housing quantity, and support the healthy operation of the real estate market.

## 2. Methods and data

### 2.1. Data

In this paper, the housing vacancy in Guangzhou's urban district is studied from the perspective of sales, and the data used to calculate the housing sales vacancy rate come from the data of residential quarters on sale in the NetEase Data Center (Guangzhou). Considering that the sales cycle of commercial housing in

China is generally 2-5 years, this paper selects 2015-2018 opened residential quarters with 70-year property rights in Guangzhou's urban district as sample data, and after optimization, 57 residential quarters (46,622 houses in total and 37,025 sold houses) are retained.



**Figure 1.** Study area and distribution of opened residential quarters

In this paper, Guangzhou's urban district is taken as the study area, with the boundary of Guangzhou administrative region in the west, the administrative boundary of Haizhu District in the south, Qianjin Subdistrict, Huangcun Subdistrict, Xintang Subdistrict, and Longdong Subdistrict in Tianhe District in the east, Jingxi Subdistrict, Tianhe Subdistrict, Huangshi Subdistrict, Xinshi Subdistrict, Tangjing Subdistrict and Songzhou Subdistrict in Baiyun District in the north. According to the actual situation of Guangzhou's urban construction and development, this area can be roughly divided into three regional functional categories from inside to outside: old area, core area and urban district area [6]. The distribution of the 46,622 houses in our sample is 4891 in the old area, 3,181 in the core area and 38,550 in the urban district area. There are 88 subdistricts in Guangzhou's urban district, among which 57 opened residential quarters are distributed in 33 subdistricts (**Figure 1**).

## 2.2. Method

In this paper, the housing sales vacancy rate is defined as the ratio of the number of unsold houses to the total number of houses. Currently, there is no uniform international standard for the calculation unit of the vacancy rate. One method is based on the vacant area and calculated in square meters. The other method calculates the vacancy rate in units of sets. In this paper, considering that the "set" is generally used as the unit in housing sales in China, and based on the availability of data, the "set" is chosen as the unit to calculate the vacancy rate. In this paper, the housing sales vacancy rate is calculated by subtracting the ratio of the number of sold houses to the total number of houses, and its formula is as follows:

$$V = (N - M) / N * 100\% \quad (1)$$

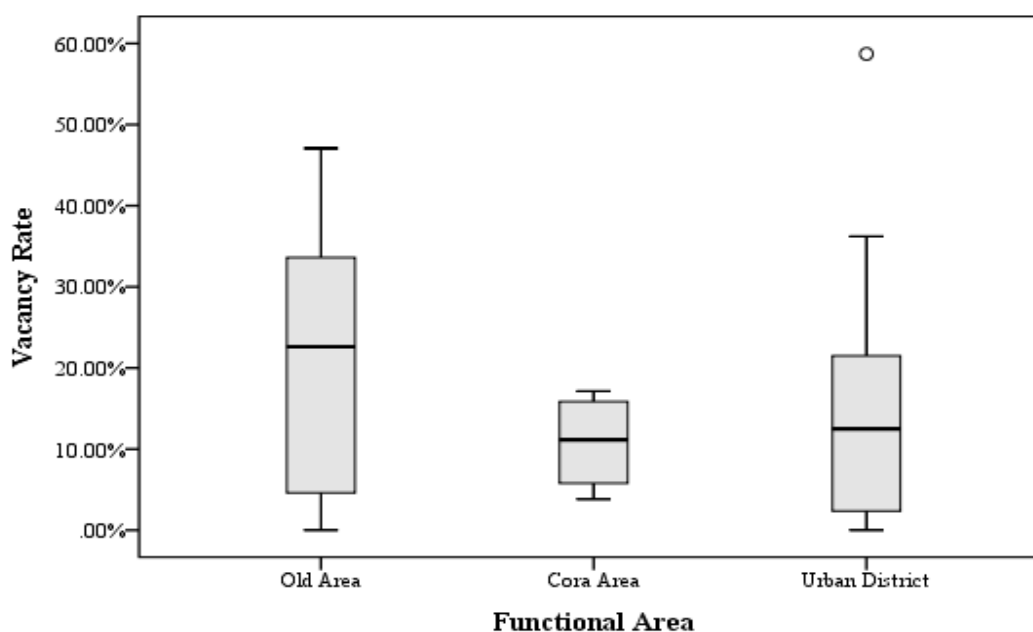
In the formula,  $V$  represents the housing vacancy rate,  $N$  represents the total number of houses available in these 57 residential quarters, and  $M$  represents the number of houses sold in the sample residential quarters. All the calculations of the vacancy rate in this paper are based on this formula.

### 3. Results and discussion

The overall vacancy rate in Guangzhou’s urban district is 20.58%, but there are obvious differences among different functional areas. As shown in **Table 1.** below, the sales vacancy rate in the urban district is the highest, reaching 21.79%, which is higher than the overall vacancy rate in Guangzhou’s urban district. The old area comes second, with a sales vacancy rate of 18.34%. The core area has the lowest vacancy rate among the three areas, with only 9.43%, which is approximately 11% lower than the overall sales vacancy rate in Guangzhou’s urban district. Generally, the vacancy rates in the three areas from inside to outside show a pattern of “high-low-high”; that is, the housing sales vacancy rates in the old area and urban area are too high, while the vacancy rates in the core area are low. Therefore, the housing sales are better and the vacancy rate is lower in the core area than in the old area and urban area.

**Table 1.** Housing vacancy of three areas in Guangzhou’s urban district

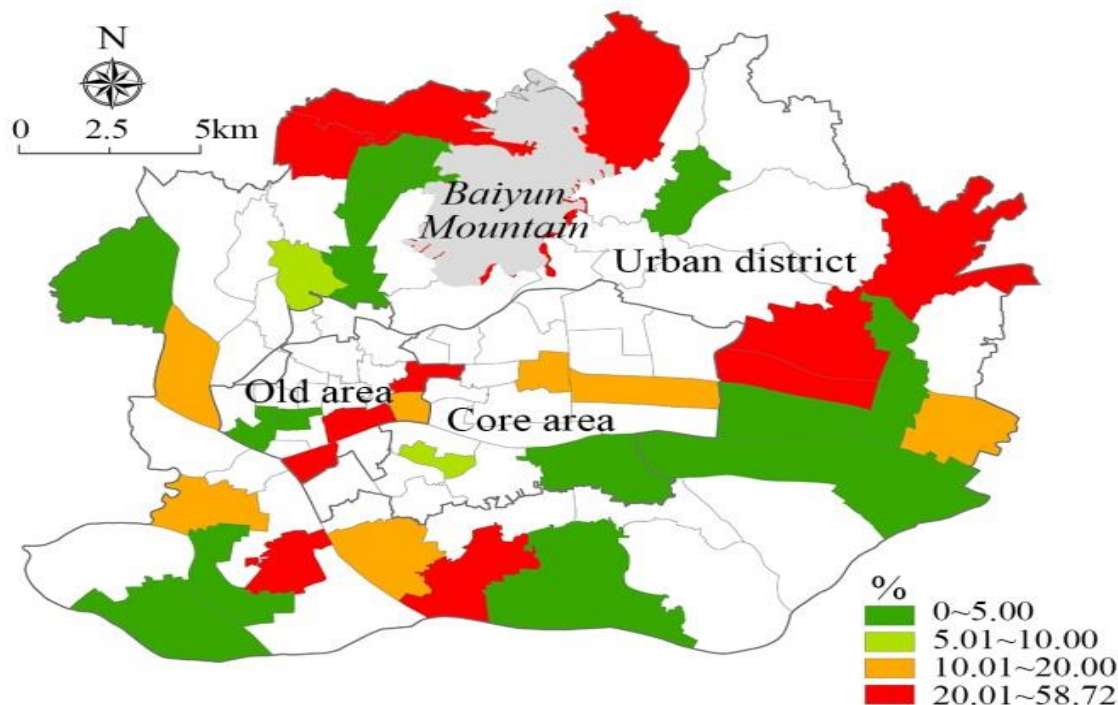
	Sold	Unsold	Total	Vacancy rate
Old area	3994	897	4891	18.34%
Core area	2881	300	3181	9.43%
Urban district	30150	8400	38550	21.79%
All	37025	9597	46622	20.58%



**Figure 2.** Vacancy rate data distribution of sub-districts in Guangzhou’s urban district

Furthermore, we analyze the vacancy pattern of subdistricts in Guangzhou’s urban district. First, **Figure 2.** shows the vacancy rate data distribution of subdistricts in three functional areas. Next, the vacancy rate is divided into four grades, with interval values of 5%, 10% and 20%, and low, medium, high and extremely high vacancy rates are defined in turn. As shown in **Figure 3.**, in the old area, subdistricts with high and extremely high vacancy rates are concentrated in the southeast, including Zhuguang, Datang, Renmin and Nanhuaxi Subdistricts, while subdistricts with low vacancy rates (< 5%) are distributed in the southwest part of this area. The overall vacancy rate in the core area is low, and two subdistricts with high vacancy rates are distributed on the east side of the area, namely, Meihuacun and Xiancun Subdistricts. Within the urban district, there are a large number of subdistricts with high and extremely high vacancy

rates (12), which are widely distributed, mainly in Xintang, Tangxia, Tianyuan and Qianjin Subdistricts in the east, Ruibao, Nanshitou and Baihedong Subdistricts in the south, Chajiao and Qiaozhong Subdistricts in the west, and Tonghe, Huangshi and Xinshi Subdistricts near Baiyun Mountain in the north, among which Xinshi Subdistrict is the subdistrict with the highest vacancy rate in Guangzhou's urban district, reaching 58.72%.



**Figure 3.** Spatial pattern of housing sales vacancy in Guangzhou's urban district

The old area is the old city of Guangzhou. Although it is located in the center of Guangzhou, the housing price here is too high, which makes it unpopular with buyers. The core area is the most prosperous central area in Guangzhou and is located in the CBD of Guangzhou, Zhujiang New Town, with numerous bustling commercial zones and convenient public transportation. In recent years, it has developed rapidly, and it has obvious location advantages that attract many buyers, with a high degree of housing destocking and a relatively low sales vacancy rate. Being located in the peripheral area of Guangzhou's urban district, far away from the city center, naturally has an impact on housing sales and leads to the high sales vacancy rate here.

#### 4. Conclusion

The vacancy rate in this region's house sales has distinct regional characteristics. The vacancy rate in the urban district is generally the greatest, followed by the old area, and the vacancy rate in the core region is low, exhibiting clear "high-low-high" characteristics. Since the core area is in the heart of Guangzhou, the vacancy rate is low. The eastern half of the ancient area, as well as the southern, eastern, and northern parts of the urban district near Baiyun Mountain, have the highest vacancy rates. Perhaps this is because this article begins with a "sales-oriented" vacancy rate, and housing sales are influenced by a variety of factors, including real estate developers' marketing strategies, policies surrounding home purchases, commodities housing prices<sup>[7]</sup>, and buyer purchasing power. Housing sales are influenced by a variety of things. Because the causes that cause variances in housing sales vacancy might come from a variety of sources, future research will focus on analysing the influencing variables of the housing sales vacancy rate.

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## **Disclosure statement**

The author declares no conflict of interest.

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