Rent Price Determinants For Residential Apartments: Micro Evidence from Yerevan*

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Abstract – This paper explores the relationship between rent prices and housing characteristics in Armenia. It employs scraped data for 6,501 residential apartments in Yerevan listed by realtors online. And finds that many housing characteristics have significant effects on rent prices. The area of the apartment, number of rooms, type of the building, and condition of the apartment have a significant positive impact on the rent prices. The location of apartments seems to influence the observed price variations. Apartments in district *Center* have drastically higher prices than ones in other districts of Yerevan.

Keywords**:** Rent Prices, Residential Apartments, Armenia

1. Introduction

Homeownership and the housing market have always been subjects for extensive discussions and analysis among scholars. However, there is relatively little focus on the rental market, despite the importance of this emerging sector (Peppercorn and Taffin 2013). The rental market enlarges annually, with 8% growth for the US and China and 5% increase for the European market in 2019 (PWC and Urban Land Institute, 2019). The rental sector deserves more attention to discussions and research in such an environment.

This paper aims to explore the relationship between rent prices and housing characteristics of residential apartments in Armenia. The official statistics display a growing tendency in the Armenian rental sector. Real Estate Cadastre of Armenia (2019) reported that in 2019 the number of renting transactions has increased by 23.5% for the entire republic and by 38.4% (19.3% refers to residential apartments) in Yerevan, the nation's capital. In addition, 57.6% of the total transactions were registered in Yerevan. These figures heighten the need for an in-depth analysis of the Armenian rental sector.

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Furthermore, there are few research papers regarding housing property for the Armenian market. The vast majority of such studies refer to policy analysis, economic and financial issues existing in the sector, and an appraisal of household property. This makes it more interesting to conduct research on this topic and reveal novel findings. To the best of our knowledge, there are no prior studies regarding the rental prices undertaken in Armenia.

The paper employs scraped data from a website of a real estate agency for analysis, and examines residential apartments located in Yerevan. Using the posted monthly rent prices and housing characteristics of the apartment, we explore the relationship between these two and highlight the variables that significantly impact the rent price variation. Such variables include location, number of rooms, space or size, floor level, and seasonal factors. Results from multivariate analysis show a strong relationship between monthly rent prices and the housing characteristics of the apartment.

The rest of this paper is structured as follows. The second section reviews the relevant literature, and this is followed by the presentation of the data and its description in section three. Multivariate estimates are provided next, with a discussion of the empirical results. Finally, we conclude this paper with general remarks.

2. Literature Review

The real estate sector is one of the most studied among scholars and a considerable portion of the literature examines house price determinants. Rent prices, however, are not well studied. Much of the available research uses macroeconomic indicators and housing market conditions to explain rent prices. However, some studies use a cross-sectional approach to determine the reasons for rent price variation in the real estate sector. This paper uses apartment characteristics for analysis and explains the relationship between rent prices and housing features like space, floor, number of rooms, among others. And we follow the literature that discusses property characteristics as rent price determinants.

Bracke (2015) analyzed the data of residential apartments in Central London to identify the cross-sectional variation of the rent-price ratio. This study is unique in that it examines the real estate sector on an individual-property level. Bracke (2015) used a multiple linear regression model to identify more significant variables that explain the rent-price ratio. He finds that most property characteristics are significant in explaining the rent-price rate. Specifically, the number of bedrooms, space, and house conditions are highly significant variables.

In a similar study, Mills (1992) uses hedonic regression analysis in the Chicago metropolitan area to determine those variables that are significant for rent prices. The data employed in the study covers 555 offices in Chicago with reported asking rent during 1990. This article mainly concentrates on the importance of property location and explains it as a rent price determinant. However, it also considered the office area and building size, number of shops, restaurants, banks nearby as determining variables. The paper concludes that many factors influence rent prices in the Chicago metropolitan area; however, most of them had modest levels of significance. Nonetheless, location coefficients had a high level of significance, which confirmed the expected results. In the suburban areas, rent prices tend to be lower than in more urban and central parts of the city.

In another study, Mourouzi-Sivitanidou (2002) also used office rent prices as a dependent variable. It employed a dataset of rental offices from 15 metropolitan areas in the US. The paper also finds that various physical features of offices like the size and the location significantly impact the rent price variation.

Several alternative approaches are employed in the literature on housing property. Joachim, Zietz, and Sirmans (2008) use a quantile regression model to better explain the relationship between prices and housing characteristics. They suggest that house price variation can be explained by the fact that housing characteristics are not valued the same in the distribution. And find that buyers who purchase more expensive apartments value specific housing characteristics like the area of the apartment differently, rather than buyers who purchase low-cost flats.

Fan, Ong, and Koh (2006) designed a decision tree model to explain the relationship between housing prices and housing characteristics in Singapore. The results show that basic housing characteristics, like the number of rooms, have a significant impact on house price variation. This study also used a decision tree approach for predicting the sale prices of the apartments.

Another model used chiefly for predicting housing prices is based on the artificial neural networks (ANN) analysis. Worzala, Lenk, and Silva (1995), Nghiep and Al (2001), and Tay and Ho (1992) discuss neural network analysis as an alternative to multiple linear regression models for price predictions and compare the results for each model. Nghiep and Al (2001) reveal that neural networks have a better performance for medium and large-size datasets. Tay and Ho (1992) also consider ANN a reliable and more convenient model for appraisal analysis compared to regression analysis. However, Worzala, Lenk, and Silva (1995) find that ANN is not always the best approach for price predictions. Zhou, Tong, and Li (2019) also use machine learning tools and textual analysis for predicting rent prices in the Atlanta 5 Metropolitan area.

The majority of research that uses alternative methods aims to forecast prices for household property rather than reveal various relationships between prices and housing characteristics. Many other papers extended the analysis to different economies. However, it is worth mentioning that there is scant research about rent prices in the Caucasus region, especially in Armenia. Stepanyan, Poghosyan, and Bibolov (2010) explain house prices using several macroeconomic indicators like GDP for former Soviet Union countries, including Armenia. Several other research papers, such as Ghevond (2006), discuss various financial and economic issues related to the Armenian real estate sector. However, there are no prior studies on the rental market of Armenia, and this paper aims to fill the existing gap in the literature.

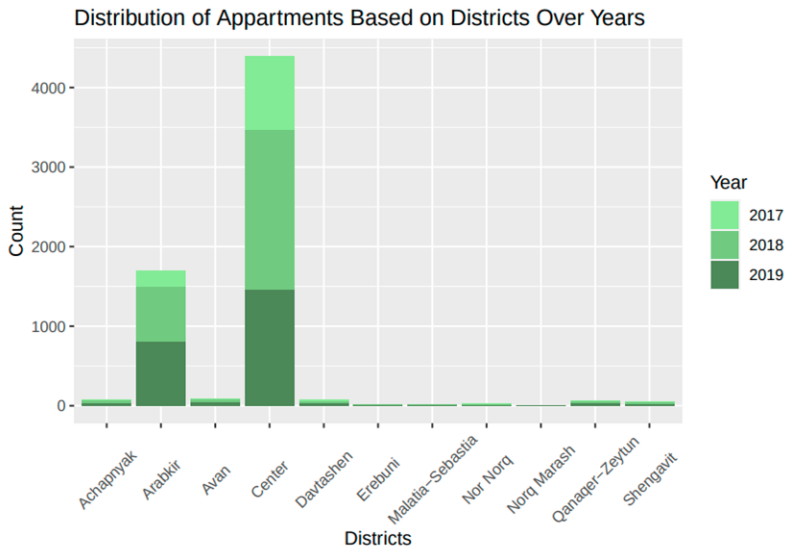
3. Data Description

Our paper closely follows the approaches implemented in Bracke (2015). The main difference is that we use the actual rent prices as the dependent variable and not the rent price ratio because of the absence of appropriate data regarding the apartments' selling prices. We also employ data collected for a shorter period containing only residential apartments in one city and not in a specific district. Our analysis uses the apartment's location to draw parallels in rent price variation among the districts. Unfortunately, our data do not contain observations from all the districts of Yerevan, and we base our analysis on apartments located only in 8 districts.

There are no detailed publicly available official records and statistics on apartments for rent in Yerevan. That is why the only way to obtain such information is to use the data available on the internet by scraping it from real estate agency websites. There are many such websites, and the first challenge was to understand from which of them we can scrape the data. As selection criteria, we concentrated on the number of posts, timing of the posts, and the popularity of agencies; we used the number of followers in social media platforms as a measure of popularity. Eventually, we selected three websites ("Realtors.am", "Estate.am", "Myreality.am") from where we could gain the information. However, after conducting more research, it was apparent that all three websites are connected, and many apartments are posted in all of them by the same property managers. That is why we decided to scrape only from "Realtors.am" and avoid having repetitive observations in the dataset.

There are several limitations to using data collected from a real estate agency website. First of all, realtors, as private entities, are profit driven. They charge commission fees to list apartments and see through rental transactions. These fees could lead to a situation where some owners may shy away from realtors and manage the rental process themselves. This may be one reason why we observe the unequal distribution of apartments among the districts of Yerevan. Figure 1 shows that most apartments are located in *Center* and *Arabkir* districts. This is not the exact representation of the market. There are many

FIGURE 1. Number of observations per district

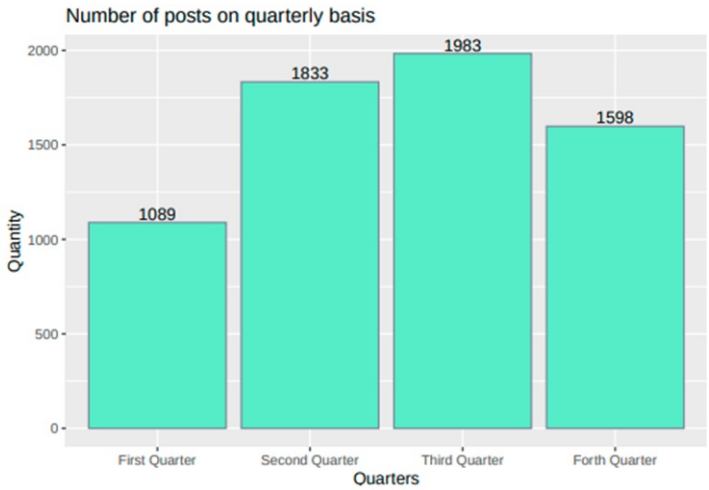


apartments available for rent in other parts of the city that are not posted on the websites. Another reason for such distribution could have cultural explanations. Yerevan is a small market, and the term "word of mouth" can effectively work, considering the elements of Armenian culture.

Furthermore, many prospective tenants may very well be more trusting of homeowners than real estate agencies. Hence, many rental transactions may have taken place directly between tenants and owners bypassing realtors. Therefore, the result we can get for specific districts may not be representative of all transitions and their distribution among districts. Nevertheless, it is worth mentioning that it is common among scholarly articles to use data scraped from websites for their empirical studies. Bracke (2015) and Zhou, Tong, and Li (2019) also have similar approaches.

To manage the limitation of unequal distribution, we decided to group districts into three main categories: *Arabkir*, *Center* and *Other*. The latter includes all the districts that we have in the dataset except for *Arabkir* and *Center*. Initially, the scraped dataset contained 10,250 observations with 11 variables. It included information about residential apartments in Yerevan from 2015 to 2020. However, the number of observations over five

FIGURE 2. Number of quarterly posts



years differed dramatically, and for most districts, there were no observations during 2015 and 2016 as shown in Figures 5 and 6 in the Appendix. Moreover, the data for 2020 is incomplete as it only included observations for January and February.

Considering all of the above factors, we selected observations only for 2017, 2018, and 2019. To complete the data pre-processing stage, we also create variables *Month* and *Year* from the initial variable *Date* and extract variables *District* and *Street* from the variable *Address*. Figure 2 shows that the number of posts highly increases during the second and third quarters. There is an 82% increase in rental posts from first to third quarters over three years. This pattern indicates that there are some seasonal patterns in rent prices. We use the variable *Month* further in our analysis to control for the seasonality in rent prices as in Bracke (2015). And finally, we also eliminate all NA values from the dataset and create several dummy variables to allow for further analysis. The resulting dataset consists of 6501 observations with 15 variables (see Table 4 in the Appendix).

Table 1 presents descriptive summary statistics for our data. Except for Price and Space, our variables are categorical in nature Price is stated in US dollar (as presented on the website), and it presents the monthly rental rate of an apartment. Figure 3 depicts the distribution of variables *Price* and *LogPrice*, the natural logarithm of Price. We can observe

TABLE 1. Descriptive summary statistics

	Other (N=415)	Arabkir (N=1699)	Center (N=4389)	Total (N=6503)
Price				
Mean (SD)	436.867 (243.246)	510.148 (236.380)	799.265 (552.299)	700.602 (494.678)
Range	95.000 - 2500.000	137.000 - 2000.000	42.000 - 5500.000	42.000 - 5500.000
Space				
Mean (SD)	79.277 (33.469)	74.493 (27.879)	83.115 (46.612)	80.617 (41.889)
Range	22.000 - 350.000	10.000 - 420.000	7.000 - 1024.000	7.000 - 1024.000
Rooms				
0	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
1	34 (8.2%)	123 (7.2%)	389 (8.9%)	546 (8.4%)
2-3	339 (81.7%)	1457 (85.8%)	3526 (80.3%)	5322 (81.8%)
4+	42 (10.1%)	119 (7.0%)	474 (10.8%)	635 (9.8%)
Floor				
1-3	180 (43.4%)	803 (47.3%)	1637 (37.3%)	2620 (40.3%)
9-14	55 (13.3%)	182 (10.7%)	644 (14.7%)	881 (13.5%)
15-20	6 (1.4%)	17 (1.0%)	67 (1.5%)	90 (1.4%)
4-8	174 (41.9%)	697 (41.0%)	2041 (46.5%)	2912 (44.8%)
Basement	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Build_Floor				
1-5	153 (36.9%)	856 (50.4%)	1601 (36.5%)	2610 (40.1%)
6-10	139 (33.5%)	431 (25.4%)	1477 (33.7%)	2047 (31.5%)
11-15	103 (24.8%)	259 (15.2%)	1017 (23.2%)	1379 (21.2%)
16+	20 (4.8%)	153 (9.0%)	294 (6.7%)	467 (7.2%)
Building_type				
Other	37 (8.9%)	148 (8.7%)	569 (13.0%)	754 (11.6%)
Monolit	159 (38.3%)	437 (25.7%)	1278 (29.1%)	1874 (28.8%)
Panel	83 (20.0%)	255 (15.0%)	844 (19.2%)	1182 (18.2%)
Stone	136 (32.8%)	859 (50.6%)	1698 (38.7%)	2693 (41.4%)
Condition				
Good	162 (39.0%)	580 (34.1%)	1136 (25.9%)	1878 (28.9%)
Newly repaired	253 (61.0%)	1119 (65.9%)	3253 (74.1%)	4625 (71.1%)
Zero condition	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Month				
First Quarter	76 (18.3%)	267 (15.7%)	746 (17.0%)	1089 (16.7%)
Second Quarter	92 (22.2%)	423 (24.9%)	1318 (30.0%)	1833 (28.2%)
Third Quarter	125 (30.1%)	427 (25.1%)	1431 (32.6%)	1983 (30.5%)
Forth Quarter	122 (29.4%)	582 (34.3%)	894 (20.4%)	1598 (24.6%)

that the distribution of rent prices is right-skewed, and it is very close to a lognormal distribution.

Table 1 also shows that the mean value of the price is $700, with a price range of $42 to $5,500. However, it is worth mentioning that minimum and maximum values of rent prices are outliers in the dataset. Figure 4 shows the mean rent prices among districts over three years. It can be observed that rent prices mainly vary from $400 to $800. Also, the mean rent price is higher for apartments located in the *Center*. It is an expected result to have comparably higher rent prices for apartments in the *Center*, as these apartments are close to many places of interest in Yerevan and are attractive, especially for tourists.

FIGURE 3. Distribution of rent prices

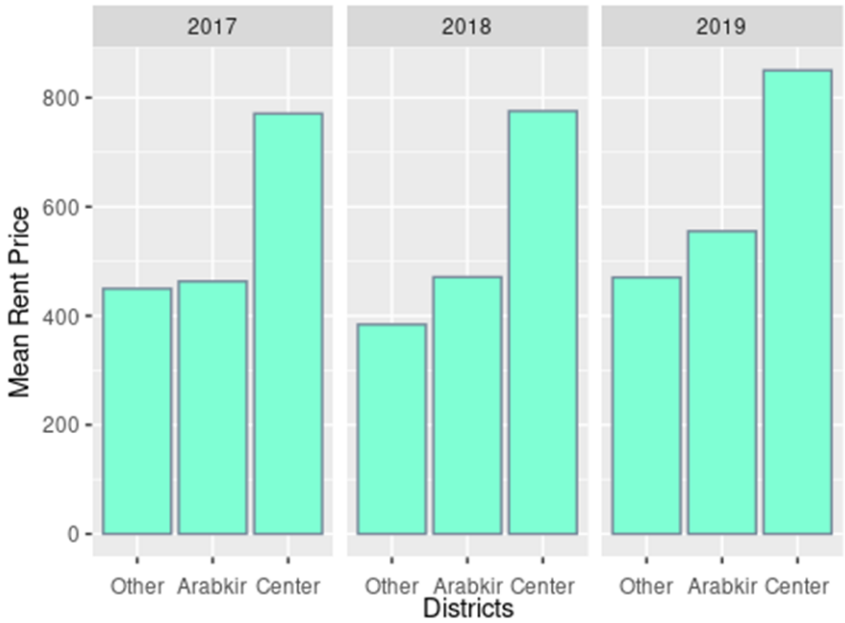
Summary statistics also show that, on average, the area of apartments is near 80 square meters. The majority of the apartments are newly repaired, have two to three rooms, and are between 4 to 8 floors. The most common apartments are in 5 level buildings from stone.

4. EMPIRICAL FINDINGS

Using our pooled cross-sectional data for the years 2017-2019, we estimate a multiple linear regression to explore the relationship between rent prices for apartments in Yerevan and their characteristics. In many ways, this is similar to the exercises in Bracke (2015), Mills (1992), and Mourouzi-Sivitanidou (2002). More specifically, we estimate an OLS equation where the dependent variable Y is $LogPrice$ with explanatory variables x_i with i ranging from 1 to t housing characteristics. The estimated specification is:

$$Y = \beta_0 + \beta_1 x_1 + ... + \beta_t x_t$$

FIGURE 4. Mean rent prices



The dependent variable is consistent with specifications employed in Stepanyan, Poghosyan, and Bibolov (2010) and Bracke (2015).

More specifically, the dependent variable Y, or LogPrice, is defined as the logarithm of the monthly rent price for an apartment. Regressors include: Rooms, Space, Floor, Build_Floor, Building_type, Condition, District, and Month. In the estimated equations, we omit values when Rooms= 1, Floor= 1-3, Build Floor= 1-5, Condition= Good, Building_type= Other, First Quarter, and District= Other as they are used as reference. All results will be interpreted relative to the omitted values.

4.1. **Discussion of the results.**

Table 2 presents OLS estimates for three specifications. For the first (hereafter referred to as Model 1), the right-hand regressors are the initial variables obtained from original data except for the variable *District*. In the second (hereafter referred to as Model 2) and third specifications (hereafter referred to as Model 3), we add two more variables; *Month* and *SpaceSQ*. The variable *Month* shows the quarter when the announcement of the apartment was posted on the website. By considering this variable, we capture the

seasonality patterns of the data and control for seasonal effects on rent prices if there are any. Bracke (2015) uses the same approach, too.

The estimates show that most of the independent variables are significant with respect to rent prices. Specifically, newly repaired apartments have higher prices, and the apartment's condition is essential for determining the rent price level. The location of the apartment, type of building, number of floors in the building, floor, and number of rooms in the apartment have a significant impact on the variation of prices, too. We can see that high-rise buildings positively affect rent prices. In other words, prices for apartments in buildings with more than 16 floors are much higher compared to 5 level buildings. This observation can be explained by the fact that there are not many old high-rise buildings with more than 16 floors in Yerevan. The vast majority of such units are newly built where house prices, in general, tend to be higher. According to GmbH (2020), the number of residential high-rise buildings in Yerevan is around 500. The same source confirms that most of the buildings with more than 60m height (approximately 17 floors) are newly built (since 2016) residential buildings. These statistics may explain the results we obtained.

The type of building also matters for rent prices. It turns out that apartments made from Monolith have higher rent prices than the ones built from stone or panel. Monolith is a costly material as it mostly consists of iron and cement, increasing the durability of the building. Consequently, apartments in such buildings have higher rent prices. Also, considering that Armenia has enormous stone resources, it becomes cheaper to construct buildings from stone and panels. Both coefficients for stone and panel variables are negative, indicating that apartments built from these materials tend to have lower rent prices compared to buildings constructed from other materials.

The results also show that apartments from 15 to 20 floors also positively impact prices albeit at a 10% confidence level. This is an unexpected result. Many people avoid living in apartments that are too high because of health issues, the absence of elevators, or costs associated with maintaining the roofs. Therefore the positive effect of the more upper floor on rent prices can only be explained by the same argument of newly built high-rise

TABLE 2. Estimates for rental prices

	Dependent variable:		
	LogPrice		
	(1)	(2)	(3)
Rooms2-3	0.220*** (0.017)	0.220*** (0.017)	0.116*** (0.016)
Rooms4+	0.481*** (0.024)	0.482*** (0.024)	0.214*** (0.024)
Space	0.005*** (0.0001)	0.005*** (0.0001)	0.010*** (0.0002)
Floor9-14	−0.065*** (0.017)	−0.065*** (0.017)	−0.047*** (0.016)
Floor15-20	0.079* (0.042)	0.080* (0.042)	0.079** (0.039)
Floor4-8	0.003 (0.010)	0.003 (0.010)	0.0004 (0.010)
Build_Floor6-10	0.024 (0.015)	0.026* (0.015)	0.009 (0.014)
Build_Floor11-15	0.057*** (0.019)	0.059*** (0.019)	0.052*** (0.018)
Build_Floor16+	0.140*** (0.025)	0.141*** (0.025)	0.107*** (0.023)
Building_typeMonolit	0.111*** (0.017)	0.110*** (0.017)	0.091*** (0.015)
Building_typePanel	−0.235*** (0.017)	−0.231*** (0.017)	−0.191*** (0.016)
Building_typeStone	−0.133*** (0.017)	−0.130*** (0.017)	−0.105*** (0.016)
ConditionNewly repaired	0.133*** (0.010)	0.137*** (0.010)	0.131*** (0.009)
DistrictArabkir	0.229*** (0.020)	0.227*** (0.020)	0.233*** (0.018)
DistrictCenter	0.522*** (0.018)	0.518*** (0.018)	0.515*** (0.017)
MonthSecond Quarter		0.082*** (0.014)	0.067*** (0.013)
MonthThird Quarter		0.077*** (0.013)	0.073*** (0.013)
MonthForth Quarter		0.054*** (0.014)	0.045*** (0.013)
SpaceSQ			−0.00001*** (0.00000)
Constant	5.310*** (0.028)	5.252*** (0.030)	5.044*** (0.029)
Observations	6,503	6,503	6,503
R^2	0.555	0.558	0.617
Adjusted R^2	0.554	0.556	0.616
Residual Std. Error	0.355 (df = 6487)	0.354 (df = 6484)	0.330 (df = 6483)
F Statistic	538.496*** (df = 15; 6487)	453.882*** (df = 18; 6484)	549.876*** (df = 19; 6483)
Note:			*p<0.1; **p<0.05; ***p<0.01
			Standard errors are reported

buildings. Moreover, we can observe that Floor 9-14 significantly influences rent prices and has a negative impact on them. The apartment's rent price will decrease by 4.6% compared to the apartment that is on 1-3 floors if it is on floors from 9 to 14.

It is also reasonable to see an increase in prices when the number of rooms is increasing in the apartment. There is a 29.8% increase from 2-3 rooms to 4+ rooms in regards to apartments with only one room. This means that rent prices increase parallel with the increase in the number of rooms, and there is a huge leap (61.8%) in rent prices when the number of rooms in the apartment is more than four compared to the apartment with one

room. This can also be connected to the space of the apartment; when there are many rooms, the area of the residence is also large. Therefore, it is quite understandable to have these two variables as highly significant ones in the model.

The results obtained for the location of the apartments should not be surprising. As described earlier, the district *Center* is one of the most beautiful parts of Yerevan, and property prices tend to be drastically high in this district because of the popularity of this area, and the availability of many places of interest, and business centers. Thus, it was expected to see the district *Center* with a positive coefficient suggesting higher rent price level when compared to other districts. This result is generally consistent with findings that properties located in urban areas have higher prices (Mourouzi-Sivitanidou 2002). The coefficient on the indicator for the district *Arabkir* is also positive and significant suggesting higher rent prices. This district is part of the *BigCenter* of Yerevan and is an active area in terms of business centers, museums, universities, and other educational institutions.

Referring to Model 2, we observe that all the levels of variable *Month* are highly significant. It shows that rent prices tend to increase more during the second and third quarters. More specifically, there are 8.5%, 8.0%, and 5.5% increase in prices for the second, third, and fourth quarters respectively compared to the first quarter. These results are quite similar to those in Bracke (2015). The increase during the two quarters can be explained by tourists' flow during the summertime and an increase in demand for renting apartments. But during the winter, prices decrease because of low demand. In many ways, perhaps this finding should not be surprising.[1]

We expand the estimated specification to include apartment size, *Space*, in quadratic form by adding *SpaceSQ* in Model 3. Adding the squared term helps to explain better the relationship between price and the area of an apartment. The quadratic specification is useful for identifying marginal effects and gauging how rent prices change with size.

[1]In an interesting study, Brouwer (2018) studies seasonality trends in the rental market. He analyzes the number of google searches for renting apartments and the actual timing of renting them. It turns out that the majority of renting transactions happen during the third quarter of the year, regardless of the fact that there is a large group of people who start searching for an apartment still from January.

This third regression shows that the turning point of variable *Space* is $500m^2$, meaning that an increase in space for an apartment with an area of more than or equal to $500m^2$ will negatively affect rent prices. However, in our dataset, there are very few apartments with space of more than $500m^2$; the number of such apartments is approximately 0.09% of the whole data available. We can conclude that *Space* is a very important factor in shaping rent prices.

4.2. **Focusing on the *Center* district.**

As noted earlier, one of the major limitations of the dataset is that the majority of the observations are located in the district *Center*. That is why it was interesting to explore what kind of results we can get if we estimate the same model only for the apartments located in the *Center* and report the results in Table 3.

From Table 3, the second and third quarters are significant for rent prices located in the *Centre*. This is quite reasonable considering the tourists flow during the summertime and the district being the most attractive touristic part of Yerevan. The relationship of other variables with rent price is practically the same as in our other models. Many variables are still highly significant in the model, which indicates that no matter where the apartment is situated, its rent price is dependent on various housing characteristics.

After all, we can conclude that various housing factors can explain the rent prices of apartments in Yerevan. The results show that location, space, number of rooms, and the floor of the apartment are highly significant variables for rent prices in the rental market of Yerevan.

5. Conclusion

This paper explored the relationship between rent prices and housing characteristics for residential apartments in Yerevan. We developed data scraped from online listings of realtors. Using pooled data for three years, we find that there are a number of variables that shape the observed rent price variations. In particular, location, number of rooms, area of the apartment, and condition, are highly significant variables.

TABLE 3. Estimates for rental prices: *Center* district

	Dependent variable:
	LogPrice
Rooms2-3	0.258*** (0.021)
Rooms4+	0.570*** (0.030)
Space	0.005*** (0.0002)
Floor9-14	−0.091*** (0.022)
Floor15-20	0.120** (0.053)
Floor4-8	0.010 (0.013)
Build_Floor6-10	0.045** (0.020)
Build_Floor11-15	0.068*** (0.024)
Build_Floor16+	0.176*** (0.033)
Building_typeMonolit	0.093*** (0.021)
Building_typePanel	−0.266*** (0.021)
Building_typeStone	−0.156*** (0.021)
ConditionNewly repaired	0.164*** (0.014)
MonthSecond Quarter	0.103*** (0.017)
MonthThird Quarter	0.079*** (0.017)
MonthForth Quarter	0.011 (0.019)
Constant	5.743*** (0.032)
Observations	4,389
R^2	0.517
Adjusted R^2	0.515
Residual Std. Error	0.376 (df = 4372)
F Statistic	292.462*** (df = 16; 4372)
Note:	*p<0.1; **p<0.05; ***p<0.01
	Standard errors are reported

Not surprisingly, apartments located in central parts of the city tend to have higher rent prices. Prices tend to increase with the increase of the area and number of rooms of apartments. It also turned out that apartments usually have higher renting prices in high-rise buildings with more than 16 floors. In addition, units located on the middle floor (9-14) are negatively correlated to rent prices. Rental rates increase with size but at a declining rate reflecting on the quadratic nature of the relationship. The findings also highlight the importance of controlling for seasonality as rental rates peak during the second and third quarters.

We extended our analysis by focusing only on the *Center* district to examine whether there are some deviations in our results in case of scaling down the geography of the research. However, the results are quite similar to those reported earlier, and there are no significant deviations.

An extension for future research could concentrate on the Armenian market as a whole and conduct comparative analysis based on regions. The rental sector is not well analyzed for the Armenian market, and there is room for further research. This paper has contributed to the enrichment of such literature.

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Appendix

TABLE 4. Description of variables

Variable Name	Description
ID	Unique identification number for each apartment
Date	Date of the post
Day	Day of the post
Month	Quarter when the announcement was posted
Year	Year of the post
District	District where the apartment is located
Street	Street where the apartment is located
Price	Value of renting the apartment for a month
Rooms	Number of rooms in the apartment
Space	Area of the apartment in square meters
Floor	Floor where the apartment is located
Build_Floor	Number of floors of the building where the apartment is located
Building_type	From what type of material is built the building
Condition	What is the apartment's condition
Dealer	Name of the dealer
Logprice	Logarithm of the variable Price
SpaceSQ	Square of the variable Space

FIGURE 5. Number of observations per district and year

FIGURE 6. Number of observations per year