

Influence of Location on Unsold New Houses by Members of Kenya Property Developers' Association in Nairobi County

*Fridah Karimi N. Kirera and Amos G. Njuguna

¹ United States International University - Africa

E-mail: fridahkirera63@gmail.com

*Corresponding author

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Abstract

This study investigated the influence of location on unsold new houses held by members of the Kenya Property Developers Association (KPSDA). Positivism philosophy and descriptive correlational research design were adopted in this study. The study population consisted of 4,085 unsold new houses held by members of KPSDA. A sample size of 364 units was drawn using a multistage random sampling technique. The units of observation in this study were the property managers, where a self-administered questionnaire was used to collect data. Analysis of the collected data was done through descriptive statistics that comprised relative frequency distributions, means, and standard deviations. The study also applied inferential statistics, which included ordinal logistic regression and one-way ANOVA. The study findings from the generalized ordinal logistic regression revealed that the location of the unsold new house explains 13.9% of the duration that the house remained unsold ($r^2 = .139$). The results further showed that the distance of the unsold new houses to the nearest markets or shopping mall ($\beta = 0.534, P < 0.05$), distance to the nearest bus station ($\beta = 0.507, P < 0.05$), and distance to the Nairobi central business district (CBD) ($\beta = 0.219, P < 0.05$) were significant predictors of the duration that the house remained unsold. Thus, the study concluded that the location of the unsold new house significantly influences the duration the house remained unsold. Therefore, the study recommends that property developers should develop houses that are close to the Nairobi CBD, shopping malls/markets, and bus stations.

Key Words: Kenya Property Developers Association, Location, Real estate inventories, Unsold new house.

Introduction

The Unsold New Housing Stock (UNHS) is a critical issue that affects the financial status of construction companies in the housing market and have impact towards a country socioeconomic status (Hawari & Rozari, 2022). The phenomenon of UNHS is an important indicator in the housing market system; it is directly related to the profitability of the construction business and appears because of an imbalance in the demand and supply of houses. Changes in demand-supply because of various factors are another phenomenon that occurs in the housing market. It is considered that these changes in demand-supply are closely related to the UNHS (Yuan et al., 2020). UNHS refer to completed residential houses that have been offered for sale but were not applied for and thus sales contracts were not made (Jang et al., 2018). Overall, UNHS work as an important market indicator for demand-supply.

The economic explanation for UNHS lies in excess supply in comparison to demand of houses in the market (Lee, Lee, & Kim, 2017), and is thus an important indicator of performance of the housing market system as it sends signals about the market trends to participants of the housing market (Lee et al., 2017). Moreover, the housing market relates to a country's aggregate economy (Walteros et al., 2018) and is therefore a predictor of economic performance (Schneider, 2020).

In Kenya, despite the housing shortage, property developers continue to record high numbers of unsold new houses in their portfolios even with the government investment, subsidies, and policies in affordable housing (KPDA, 2019). The Kenya Property Developer's Association (KPDA) indicated that in 2021, there were 4085 Unsold New Houses in Nairobi County and its Metropolis (KPDA, 2021). Further, Cytonn (2021) indicated that some of the UNHS remain unsold for over a year thus tying up funds for housing developers and thus jeopardizing their capacity to engage in develop of more new houses to meet the ever-increasing demand. The factors contributing towards UNHS have been a subject of study, but most studies focus on the demand side factors, hence there is a dearth of studies on the supply side factors (Li & Wei, 2020). One of the most critical supply side factors affecting UNHS is location which is considered a critical factor and highly influential for a consumer when they are selecting a housing product and is characterized by strategic location, proximity to working place, places of worship, schools, public facilities and markets (Rahadi, Wiryono, Koesrindartoto, & Syamwil, 2015a; Farraz & Barus, 2019). Owning a house at a bad location could be detrimental to its market value and thus homebuyers could be influenced by location attributes when making the purchase decision (Liao, Farger & Ewing, 2015). This study seeks to explore the role played by location in influencing unsold new houses held by members of KPDA in Kenya.

Statement of the Problem

According to the CAHF (2021), Kenya experiences an annual demand for 250,000 residential housing units, while the estimated supply stands at 50,000 units. Consequently, this creates a deficit of 200,000 units. The nation exhibits an urbanization rate of 28%, wherein 46.5% of the urban population resides in slum areas. According to the World Bank (2021), if appropriate interventions are not implemented, the housing deficit is expected to rise due to an annual population growth rate of 2.8% observed in the last two decades. The imbalance between the supply and demand for housing primarily stems from economic factors, particularly the issue of unaffordability (Cytonn, 2021). Despite the prevailing housing shortage in Kenya, property developers persistently observe a significant accumulation of unsold newly constructed houses in their portfolios, despite the government's efforts to address the issue through investments, subsidies, and affordable housing policies (KPDA, 2019). Based on the data provided by the KPDA (2021), the combined number of newly constructed residential properties that remained unsold within Nairobi County and its metropolis in 2021 amounted to 4,085 units. Furthermore, as stated by Cytonn (2021), specific segments of the UNHS encounter an extended duration of remaining unsold, leading to the immobilization of capital for housing developers. As a result, this circumstance presents a potential challenge to their capacity to engage in the development of further residential properties to meet the ever-increasing demand.

Extensive research has been conducted on the factors that contribute to the demand side of UNHS. Ceritoğlu (2020) conducted a study examining the permanent income elasticity, price elasticity, and interest rate elasticity of housing demand. Moreover, the study conducted by Wang, Hui, and Sun (2018) examined the relationship between population ageing and real

estate prices in relation to housing demand. In a similar vein, Strobel, Nguyen, and Lee (2020) investigated the impact of macroeconomic uncertainty on housing demand. The findings of these studies have been utilized in certain countries to enhance the demand for housing. According to Baqae and Farhi (2020), it has been suggested that a decrease in the unemployment rate would have a substantial impact on the demand for housing. This recommendation has been put into practice in various countries. Insufficient research attention has been devoted to the examination of the housing supply aspect, as most studies have primarily concentrated on analyzing the housing demand facet. Hence, the objective of this study was to examine the impact of location-related supply side factors on the housing market, with the aim of making a significant contribution to the housing supply. Furthermore, there is a dearth of research conducted in Kenya pertaining to the issue of unsold newly constructed residential properties within the domain of housing developers.

Study Hypothesis

H₀: Location does not significantly influence unsold new houses by members of Kenya Property Developers Association.

Literature Review

Theoretical Review

This study was based on the economic Theory of Housing Demand that was first developed by Menger and Jevons in 1871 (Arnott, 1989). Several scholars have studied the development of the theory away from the claim by neoclassical economists that determinants of housing demand are principally income and price (Megbolugbe et al., 1991). Arnott (1987) argued that housing has a set of intrinsic characteristics, which make it significantly different from other goods, and as a result, the housing market is significantly different from any other market. Arnott (1987) argued that housing demand is sensitive to household income and demographic characteristics as well as prices, and the house's location. When a household is purchasing a housing unit, it obtains not only the physical units but also the spatial fixity, a neighborhood, as set of public services, tax obligations and a set of legal and obligations that act as security of tenure (Arnott, 1987). Follain and Jimenez (1985) added to the components of the economic modelling of housing demand determinants arguing that locational characteristics are essential in estimating household demand. The specification of location involves at least five aspects: i) distance from important locations such as CBD, employment concentrations, shopping areas and transportation routes, ii) nature of land use in the neighborhood, iii) the physical nature of the neighborhood of the house, iv) socioeconomic character of the neighborhood and v) local government jurisdiction (Megbolugbe et al., 1991). This theory was thus applied to link location aspects with UNHS.

Empirical Review

The distance of a residential property to the urban center's Central Business District (CBD) could influence its demand and thus affect UNHS. CBD is one of the kernel of the city characterized by more and better resources of floating population, finance, technology, infrastructure and education when compared to other locations in the Country (Dziauddin & Misran, 2016; Jia, Rong, Gu, & Xie, 2020). The net population declines with the location moves away from the CBD and there is a drop in demand for housing as the distance from CBD rise (McDonald, 2020). Large number of constructions such as hotels, apartments, trade, technological and cultural organizations are located at the CBD therefore more people prefer to reside close to the CBD (Jia et al., 2020). Skill intensive establishment have a stronger preference of having their factories located in close proximity of the CBD hence

CBD takes a large proportion in total investment attracted in cities (Marantz & Zheng, 2020). A study on the influence of Central Business District on housing performance of Nanchang City in China by Jia et al. (2020) showed that as the distance between the houses and the CBD grew, the rental and purchase of houses decreased.

A study on the role of listing price strategies on the probability of selling a house in Vietnam by Bich, Trong, and Thanh (2020) measured the dynamic effect on probability of selling a house against distance to CBD and concluded that distance to CBD has a positive and significant effect on the probability of a sale. Ebekoziem, Abdul-Aziz, and Jaafar (2020) in exploratory research examined the low-cost housing demand to better understand the issue of unsold houses and offer possible solutions to the Malaysian housing supply-demand gap. The study found that properties within a five kilometers radius of the Central Business Unit, and social amenities such as hospitals, schools, security apparatus and parks sold faster than houses farther away from such amenities. The utility or satisfaction that consumers obtain from housing units is based on several factors, among them neighborhood characteristics such as proximity to market center, banks, schools, hospitals and police stations as well as crime rates in the community (Nepal et al., 2020). Thus, when a consumer is buying a housing unit, the consumer pays not only for the housing unit but for the local environment and neighborhood characteristics (Tian et al., 2015; Nepal et al., 2020).

Conceptual Framework

Figure 1 presents the conceptual framework which illustrates the hypothesized relationships.

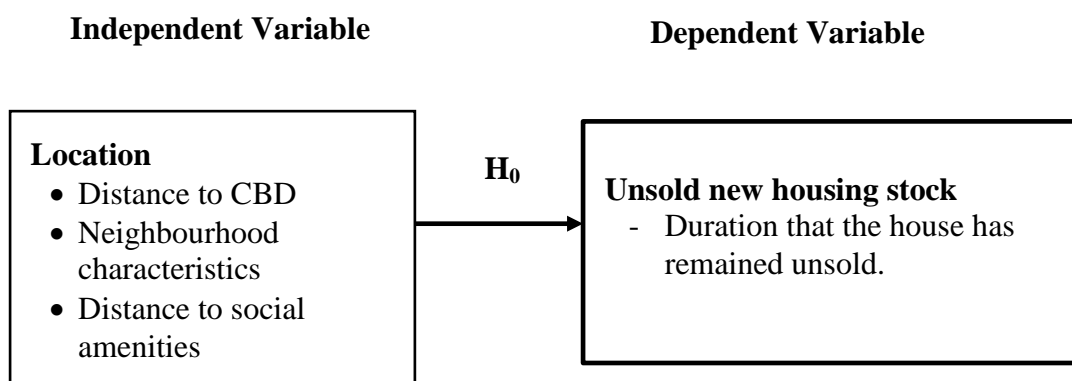


Figure 1: Conceptual Framework

Methodology

This research adopted a positivism approach. A descriptive correlational research design was adopted in this study. The target population was the property developers of the 4,085 unsold new houses under high-rise flats developments in Nairobi County held by residential property developers who were members of KPDA. The unsold new houses were the units of analysis whereas the managers of the housing development firms were the units of observation. This study applied multi-stage probability sampling technique because of the geographical spread of the samples to ensure proper representation of sample. Census was applied at the first stage. The second stage was stratified random sampling where the target population was divided into discrete groups prior to sampling (Saunders et al., 2019). The Unsold new high-rise flats houses were stratified per region as stipulated by the Department of City Planning, Nairobi City Council 2019 guidelines (City Council of Nairobi, 2019). The sample was

proportionally allocated to each cluster. Finally, simple random sampling was used to select the sample size of 364 units from each cluster of the population.

Results and Discussion

Descriptive Statistics for Unsold New Houses

The dependent variable in this research was the unsold new houses. The nature of development, the study investigated whether the unsold new house was in a development that was purely exclusive 1 bedroom, exclusive 2 bedroom, exclusive 3 bedroom, exclusive 4 bedroom, or a mixed development. The results are summarized in Table 1.

Table 1. Nature of the Property Development

Nature of development	Frequency	Percent
Exclusive 1 bedroom	22	6.7
Exclusive 2 bedroom	49	14.9
Exclusive 3 bedroom	127	38.8
Exclusive 4 bedroom	48	14.6
Mixed development (1, 2, 3, 4 and more bedrooms)	82	25.0
Total	328	100.0

The findings provided in Table 1 show that 38.8% of the unsold new houses were in an exclusive 3-bedroom development.

The study further investigated the likelihood of the house remaining unsold when it was in a mixed development. The results are presented in Table 2.

Table 2. House Likely to Remain Unsold If Development Is Mixed

Type of House	Frequency	Percent
1 bedroom	3	3.7
2 bedrooms	21	25.6
3 bedrooms	52	63.4
4 bedrooms	6	7.3
Total	82	100.0

The findings provided in Table 4.11 indicate that 63.4% of the respondents were of the view that if a house is in a mixed development, three-bedroom houses were the ones most likely to remain unsold. Only 3.7% indicated 1-bedroom houses as the most likely to remain unsold in a mixed development.

Regarding the current percentage of occupancy, the findings are provided in Table 3.

Table 3. Current Percentage of Occupancy for the Development

Percentage of occupancy	Frequency	Percent
Less than 15%	19	5.8
16-30%	139	42.4
31-45%	88	26.8
46-60%	25	7.6
More than 60%	57	17.4
Total	328	100.0

The study findings in Table 3 indicate that 42.4% of developments comprised unsold new houses that had 16 to 30% occupancy while only 5.8% had less than 15% occupancy. These findings imply that of all the developments that had unsold new houses, 51.8% had less than half occupancy.

The study further investigated the duration that the house had remained unsold since marketing of the house began and the results are provided in Table 4.

Table 4. Duration That the House Has Remained Unsold

Duration	Frequency	Percent
6 months and below	81	24.7
7-12 months	78	23.8
13-18 months	106	32.3
19-24 months	15	4.6
over 24 months	48	14.6
Total	328	100.0

Table 4 provides findings, which indicate that among the unsold new houses that were included in the study, 32.3% had remained unsold for a period between 13 and 18 months. The findings also indicate that 4.6% of the unsold new houses had remained in that condition for a period between 19 and 24 months. These findings indicate 80.8% of the new houses had remained unsold for less than 18 months.

Descriptive Statistics for Location of Unsold New House

Table 5 provides the summary of the results.

Table 5. Descriptive Statistics for Location of Unsold New House from Various Amenities

Location aspect	5 Km and Less		6-10 Km		11-15 Km	
	F	%	F	%	F	%
Distance from the house to nearest lower primary school	161	49.1	143	43.6	24	7.3
Distance from the house to the nearest health facility / hospital	182	55.5	140	42.7	6	1.8
Distance from the house to the nearest bus station	171	52.1	143	43.6	14	4.3
Distance from the house to the nearest police station	166	50.6	149	45.4	13	4.0
Distance from the house to the nearest markets or shopping mall	184	56.1	127	38.7	17	5.2

The study results summarized in Table 5 indicate that the majority (56.1%) of the Unsold New Houses were 5 kilometers and less from the nearest markets or shopping mall and 55.5% were 5 kilometers or less from the nearest health facility / hospital. Additionally, most of the unsold new houses (52.1%) were 5 kilometers or less from the nearest bus station. Besides, the findings indicated that most of the unsold new houses were 5 kilometers or less from the nearest police station while 49.1% were 5 kilometers or less from the nearest lower

primary school. These findings imply that most of the Unsold New Houses were developed near various social amenities.

Regarding the distance of the unsold new houses from the Nairobi Central Business District, the findings are provided in Table 6.

Table 6. Distance from the House to the Nairobi Central Business District

Distance	Frequency	Percent
Less than 20km	145	44.2
21-30km	129	39.3
31-40km	54	16.5
Total	328	100.0

The study findings provided in Table 6 show that 44.2% of the unsold new houses included in the study were less than 20 kilometers from the Nairobi CBD while 39.3% were 21 to 30 kilometers from the CBD. Those unsold new houses that were 31 to 40 kilometers away from the Nairobi CBD were 16.5%.

Ordinal Logistic Regression Results

An ordinal logistic regression model was fitted to investigate the influence of location of the Unsold New House on the duration that the unit had remained in that state. The researcher undertook preliminary tests to assess whether the four assumptions of ordinal logistic regression were satisfied. These included the dependent variable being on an ordinal level, one or more ordinal, continuous, or categorical independent variables, no multi-collinearity and assumption of proportionate odds or parallel lines (Wooldridge, 2019). All these assumptions were met, and the proportional odds ordered logistic regression model was fitted to determine the extent to which location predicted the duration that the new house remained unsold. A few generalized ordered logistic regression tests were conducted to test the hypothesis.

First, the results of the Pseudo R-Squared for the model of location against duration of Unsold New Houses is provided in Table 7.

Table 7. Pseudo R-Square for the Model of Location against Duration of Unsold New Houses

Cox and Snell	.132
Nagelkerke	.139
McFadden	.048

Link function: Logit.

Findings in Table 7 indicate that the Nagelkerke Pseudo R – squared was 0.139 indicating that location of the unsold new house explained 13.9% of the duration it remained unsold from the time marketing began.

The fitness of the model was also tested using the Omnibus Likelihood Ratio Chi-Square test. The findings are summarized in Table 8.

Table 8. Omnibus Test for the Model of Location against Duration of Unsold New Houses

Likelihood Ratio Chi-Square	df	Sig.
46.252	6	.000

The study results provided in Table 8 indicate that the model was a good fit (Likelihood Ratio Chi-Square = 46.252, $p < 0.05$). This shows that at least one of the independent variables used in the model had a significant influence on the duration of the Unsold New Houses. This led to the rejection of the null hypothesis:

H_0 : There is a no significant relationship between Location and Unsold New Houses held by members of Kenya Property Developers Association (KPDA).

The study hence accepted the alternative hypothesis that there is significant relationship between location and unsold new houses held by members of KPDA.

To determine the independent variables that had a significant influence on the duration of the Unsold New Houses, the parameter estimates were developed. The results are provided in Table 9.

Table 9. Parameter estimates for Location against Duration of Unsold New Houses

Parameter	B	Std. Error	95% Confidence Interval		Wald Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
Threshold d							
[6 or less=1]	.674	.4466	-.201	1.549	2.277	1	.131
[7-12=2]	1.777	.4519	.891	2.663	15.463	1	.000
[13-18=3]	3.443	.4865	2.489	4.396	50.087	1	.000
[19-24=4]	3.831	.4985	2.854	4.808	59.070	1	.000
Distance to nearest lower primary school	-.309	.1682	-.638	.021	3.371	1	.066
Distance to the nearest Health facility	-.030	.1749	-.373	.313	.030	1	.863
Distance to the nearest bus station	.507	.1500	.213	.801	11.425	1	.001
Distance to the nearest police station	-.056	.1599	-.370	.257	.123	1	.725
Distance to the nearest markets or shopping mall	.534	.1399	.260	.809	14.585	1	.000
Distance to the Nairobi CBD	.219	.1046	.014	.424	4.389	1	.036

Dependent Variable: Duration the house has remained unsold.

The ordinal regression model fitted from the results in Table 4.22 was;

$$\text{Logit } P(Y \leq 6 \text{ or less}) = 0.674 - 0.507X_3 - 0.534X_5 - 0.219X_6$$

$$\text{Logit } P(Y \leq 7-12) = 1.777 - 0.507X_3 - 0.534X_5 - 0.219X_6$$

$$\text{Logit } P(Y \leq 13-18) = 3.443 - 0.507X_3 - 0.534X_5 - 0.219X_6$$

$$\text{Logit } P(Y \leq 19-24) = 3.831 - 0.507X_3 - 0.534X_5 - 0.219X_6$$

Where Y is Duration that the house had remained unsold, X_3 is Distance to the nearest bus station, X_5 is Distance to the nearest markets or shopping mall, and X_6 is Distance to the nearest markets or shopping mall. The findings provided in Table 9 indicate that distance of the Unsold New Houses to the nearest markets or shopping mall ($B = 0.534$, $P < 0.05$), distance to the nearest bus station ($B = 0.507$, $P < 0.05$), and distance to the Nairobi CBD ($B = 0.219$, $P < 0.05$) were significant predictors of the duration of unsold new houses. These findings imply that the further the unsold new house is to the nearest bus station, the more likely it is to remain unsold for a longer duration.

The findings also showed that for every one-unit increase in the distance of the Unsold New Houses from the nearest markets or shopping mall, the log odds of duration of the unsold new house rising from a lower level to a higher-level increase by 0.534, while all other variables in the model remain constant. These findings implied that houses nearer to the Nairobi CBD are likely to sell faster compared to those further from the Nairobi CBD. However, distance of the unsold new house to the nearest lower primary school, distance to the nearest health facility and distance to the nearest police station were not significant predictors of the duration of the unsold new house.

Discussion of Findings

The study sought to determine the influence on location on Unsold New Houses held members of Kenya Property Developers Association. The findings indicate that distance of the Unsold New Houses to the Nairobi CBD ($B = 0.219$, $P < 0.05$) was significant predictors of the duration of unsold new houses. The results support the findings of a study conducted by Jia et al. (2020) that found the 1 km growth of the distance between the community and the CBD in Bayi Square led to a decrease in the rental and purchase houses. The results also support the findings of Bich et al. (2020) who measured the dynamic effect on probability of selling a house against distance to CBD and concluded that distance to CBD has a positive and significant effect on the probability of a sale with a 1.23% increase in the probability that a property will be sold as the distance from the development reduces.

The findings from the current study found that distance of the Unsold New Houses to the nearest markets or shopping mall ($B = 0.534$, $P < 0.05$) was a significant predictor of the duration of unsold new houses. The results support findings of a study conducted by Yoo et al. (2021) investigating how locational factors affected unsold unit ratio that concluded that the proximity to the shopping malls were positively associated with the reduction of unsold units. The results also support the findings of Majelan et al. (2020) that concluded that good location is associated with high demand and location was a major factor when choosing an affordable housing since homebuyers usually look for strategic housing close to the city center, shopping malls and work place since this offers convenience to homebuyers in terms of distance, travel time and cost.

The finding indicates that distance of the Unsold New Houses to the nearest bus station ($B = 0.507$, $P < 0.05$) was significant predictors of the duration of unsold new houses. The results are similar to Gentili and Hoekstra (2019) who found that dwellings in the market remain unsold because the location of the house is remote or inaccessible hence, they are not easily marketable. The results also support the findings of a study conducted by Adzhar et al., (2021) that concluded that distance to public transportation stations was a crucial factor that buyers consider when buying homes.

Conclusion and Recommendations

The findings from the generalized ordinal logistic regression analysis the parameter estimates established that distance of the Unsold New Houses to the nearest markets or shopping mall ,distance to the nearest bus station and distance to the Nairobi CBD were significant predictors. Hence, the study concludes that location has a significant influence on Unsold New Houses in Kenya. It is therefore important that property developers strategically choose the location of their developments to reduce the number of unsold new houses in their portfolio. The houses should be located closer to the nearest bus station and markets/shopping mall, the houses should be closer to Nairobi CBD.

This study provided valuable empirical findings regarding the role of location on UNHS in Nairobi, Kenya. However, the study was limited to residential houses within high-rise apartments. Hence, future research should be conducted to explore other property developments such as commercial developments and residential houses in other designs such as bungalows, villas, and town houses. Additionally, the study was limited to a cut off period of December 2020, a period that was affected by COVID-19 pandemic. Therefore, longitudinal research should be conducted to establish whether the same findings can be duplicated across different periods. Lastly, the study used only structured questionnaires to gather data. In future research, other data gathering tools such as key informant interviews and focus group discussion should be incorporated to provide more insights on how locational factors influence UNHS.

References

- Adzhar, S. M., Rahim, N. A., Basrah, N., Majid, R. A., & Mustafar, S. (2021). Overview on built environment planning: Residential overhang factors in Malaysia affordable housing. *IOP Conference Series: Earth and Environmental Science*, 881(1). <https://doi.org/10.1088/1755-1315/881/1/012018>.
- Arnott, R. (1987). Economic theory and housing. *Handbook of Regional and Urban Economics*, 2, 959–988. [https://doi.org/10.1016/S1574-0080\(87\)80010-X](https://doi.org/10.1016/S1574-0080(87)80010-X)
- Arnott, R. (1989). Housing vacancies, thin markets, and idiosyncratic tastes. *The Journal of Real Estate Finance and Economics*, 2(1), 5–30. <https://doi.org/10.1007/BF00161714>
- Baqae, D. R., & Farhi, E. (2020). Productivity and Misallocation in General Equilibrium. *Quarterly Journal of Economics*, 135(1), 105–163. <https://doi.org/10.1093/qje/qjz030>
- Barreca, A., Curto, R., & Rolando, D. (2020). Is the Real Estate Market of New Housing Stock Influenced by Urban Vibrancy? *Complexity*, 2020. <https://doi.org/10.1155/2020/1908698>
- Békés, G., & Kézdi, G. (2021). *Data analysis for business, economics, and policy*. Cambridge University Press.
- Belke, A., & Keil, J. (2018). Fundamental Determinants of Real Estate Prices: A Panel Study of German Regions. *International Advances in Economic Research*, 24(1), 25–45. <https://doi.org/10.1007/s11294-018-9671-2>
- Bich, H. N. T., Trong, H. N., & Thanh, H. T. (2020). The Role of Listing Price Strategies on the Probability of Selling a House: Evidence from Vietnam. *Real Estate Management and Valuation*, 28(2), 63–75. <https://doi.org/10.1515/remav-2020-0016>
- Bogataj, D., McDonnell, D. R., & Bogataj, M. (2016). Management, financing and taxation of housing stock in the shrinking cities of aging societies. *International Journal of Production Economics*, 181, 2–13. <https://doi.org/10.1016/j.ijpe.2016.08.017>
- CAHF. (2021). A review of Africa's housing finance markets 2021 Year Book. Nairobi: CAHF.

- Cai, W., & Lu, X. (2015). Housing affordability: Beyond the income and price terms, using China as a case study. *Habitat International*, 47, 169–175.
<https://doi.org/10.1016/j.habitatint.2015.01.021>
- Cooper, D. R., & Schindler, P. S. (2022). *Business Research Methods* (14th ed.). McGraw-Hill Education. <https://www.amazon.com/Business-Research-Methods-Donald-Cooper/dp/0073521507>
- Cytonn. (2021). Nairobi Metropolitan Area Residential Report 2021. Nairobi, Kenya: Cytonn.
- Dziauddin, M. F., & Misran, M. (2016). Does Accessibility to the Central Business District (CBD) Have an Impact on High-Rise Condominium Price Gradient in Kuala Lumpur, Malaysia? *SHS Web of Conferences*, 23(January), 02004. <https://doi.org/10.1051/shsconf/20162302004>
- Ebekozien, A., Abdul-Aziz, A. R., & Jaafar, M. (2020). Low-cost housing demand-supply gap: Government housing planners perspective on possible solutions. *International Journal of Construction Management*, 0(0), 1–10. <https://doi.org/10.1080/15623599.2020.1742627>
- Farraz, M. A., & Barus, L. S. (2019, April). Housing Preferences and Choice Young Families Commuters in Depok City, Indonesia. In *IOP Conference Series: Earth and Environmental Science* (Vol. 264, No. 1, p. 012010). IOP Publishing.
- Gopal, P., & Saraiva, C. (2022, March 12). Homes for Sale Surge as Builders Are Stuck With Too Much Inventory. *Bloomberg*. <https://www.bloomberg.com/news/articles/2022-08-09/homes-for-sale-surge-as-builders-are-stuck-with-too-much-inventory#xj4y7vzkg>
- Hawari, N. N., & Rozari, N. N. B. (2022). Analysing the unsold housing stock problem using system dynamics approach. *AIP Conference Proceedings*, 2472(1). <https://doi.org/10.1063/5.0092723/2825785>
- Ishak, N. L., Yakub, A. A., & Achu, K. (2019). Buyers' perception on factors affecting affordable housing overhang in Johor, Malaysia. 13(2), 48–58.
- Islam, M. S., Hossain, R., Morshed, M. M., & Afrin, S. (2020). The value of environmental (dis)amenities in the urban housing market: Evidence from Khulna, Bangladesh. *Journal of Urban Management*, July 2019, 1–11. <https://doi.org/10.1016/j.jum.2020.02.001>
- Jang, S., Lee, S., Kim, J., & Kim, J. (2018). Relationship Between Demand-supply in the Housing Market and Unsold New Housing Stocks. *Journal of Asian Architecture and Building Engineering*, 9(2), 387–394. <https://doi.org/10.3130/JAABE.9.387>
- Jia, J., Rong, Y., Gu, Z., & Xie, D. (2020). Study on the Influence of Central Business District on House Market Price: a Case Study of Nanchang City, China. 116(Icesed), 1–5.
- JLL. (2019). Malaysia Property Market Trend Analysis - Residential Big Data Analytics for Real Estate & *Bank Negara Malaysia and Department of Statistics, May*.
- KPDA. (2019). Kenya Property Developers Association report 2019. Nairobi, Kenya: KPDA.
- KPDA. (2021). Kenya Property Developers Association report 2021. Nairobi, Kenya: KPDA.
- Kwoun, M. J., Lee, S. H., Kim, J. H., & Kim, J. J. (2013). Dynamic cycles of unsold new housing stocks, investment in housing, and housing supply-demand. *Mathematical and Computer Modelling*, 57(9–10), 2094–2105. <https://doi.org/10.1016/j.mcm.2011.08.005>
- Lee, Y., Lee, S., & Kim, J. (2017). Analysis of the dynamic relationship between fluctuations in the Korean housing market and the occurrence of unsold new housing stocks. *Sustainability (Switzerland)*, 9(1). <https://doi.org/10.3390/su9010107>
- Li, H., & Wei, Y. D. (2020). Spatial inequality of housing value changes since the financial crisis. *Applied Geography*, 115(October 2019), 102141. <https://doi.org/10.1016/j.apgeog.2019.102141>
- Majelan, N. A., Rangga, W., Jiram, A., Ismail, A., & Bujang, A. A. (2020). Efficiency Of Housing Delivery System for Affordable Homeownership In Malaysia: A Review Of Literature. *Jurnal Kemanusiaan*, 18(2), 20–24.

- Marantz, N. J., & Zheng, H. (2020). State Affordable Housing Appeals Systems and Access to Opportunity: Evidence from the Northeastern United States. *Housing Policy Debate*, 30(3), 370–395. <https://doi.org/10.1080/10511482.2020.1712612>
- Megbolugbe, I. F., Marks, A. P., & Schwartz, M. B. (1991). The Economic Theory of Housing Demand: A Critical Review. *Journal of Real Estate Research*, 6(3), 381–393.
- Nepal, M., Rai, R. K., Khadayat, M. S., & Somanathan, E. (2020). Value of cleaner neighbourhoods: Application of hedonic price model in low-income context. *World Development*, 131, 104965. <https://doi.org/10.1016/j.worlddev.2020.104965>
- Olanrewaju, A. L., & Woon, T. C. (2017). An exploration of determinants of affordable housing choice. *International Journal of Housing Markets and Analysis*, 10(5), 703–723. <https://doi.org/10.1108/IJHMA-11-2016-0074>
- Rahadi, R. A., Wiryono, S. K., Koesrindartoto, D. P., & Syamwil, I. B. (2015b). Factors influencing the price of housing in Indonesia. *International Journal of Housing Markets and Analysis*, 8(2), 169–188. <https://doi.org/10.1108/IJHMA-04-2014-0008>
- Ramli, F., Zainal, R., & Ali, M. (2019). Prediction supply modelling for high-cost housing in Malaysia. *International Journal of Supply Chain Management*, 8(3), 657–664.
- Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research Methods for Business Students* (8th ed.). Pearson.
- Schneider, M. (2020). *Exploring supply and demand-driven imbalances in Austria's housing market*. 54–71.
- Sinha, P., Caulkins, M. L., & Cropper, M. L. (2018). Household location decisions and the value of climate amenities. *Journal of Environmental Economics and Management*, 92, 608–637. <https://doi.org/10.1016/j.jeem.2017.08.005>
- Tian, G., Ewing, R., & Greene, W. (2015). Desire for Smart Growth: A Survey of Residential Preferences in the Salt Lake Region of Utah. *Housing Policy Debate*, 25(3), 446–462. <https://doi.org/10.1080/10511482.2014.971333>
- Tomoko & Yui. (2020). *The Rise in Vacant Housing in Post-growth Japan*. Tokyo: Reuters.
- Vargas Walteros, C., Novoa Hoyos, A., Arias Ardila, A. D., & Peña Ballesteros, A. S. (2018). Analysis of demand and supply in the Colombian housing market: impacts and influences 2005-2016. *International Journal of Housing Markets and Analysis*, 11(1), 149–172. <https://doi.org/10.1108/IJHMA-01-2017-0006>
- Wooldridge, J. (2019). *Introductory Econometrics: A Modern Approach* (7th ed.). Cengage Learning.
- World Bank. (2021). Population living in slums (% of urban population). Washington: UN-Habitat:
- Wu, C., Ye, X., Ren, F., Wan, Y., Ning, P., & Du, Q. (2016). Spatial and social media data analytics of housing prices in Shenzhen, China. *PLoS ONE*, 11(10). <https://doi.org/10.1371/JOURNAL.PONE.0164553>
- Yoo, Hayoung, & Yoon, H. (2021). The effect of green characteristics in reducing the inventory of unsold housing in new residential developments-a case of Gyeonggi Province, in South Korea. *Land*, 10(4). <https://doi.org/10.3390/land10040377>
- Yuan, F., Wei, Y. D., & Wu, J. (2020). Amenity effects of urban facilities on housing prices in China: Accessibility, scarcity, and urban spaces. *Cities*, 96. <https://doi.org/10.1016/J.CITIES.2019.102433>
- Yusoff, S. M., Shahril, M., & Rahman, A. (2017). Oversupply causes of double storey terrace houses in Johor Nurul Sahfikar. *Habitable Cities*, 11(3), 118-127.