HOUSING PRICE INDEX

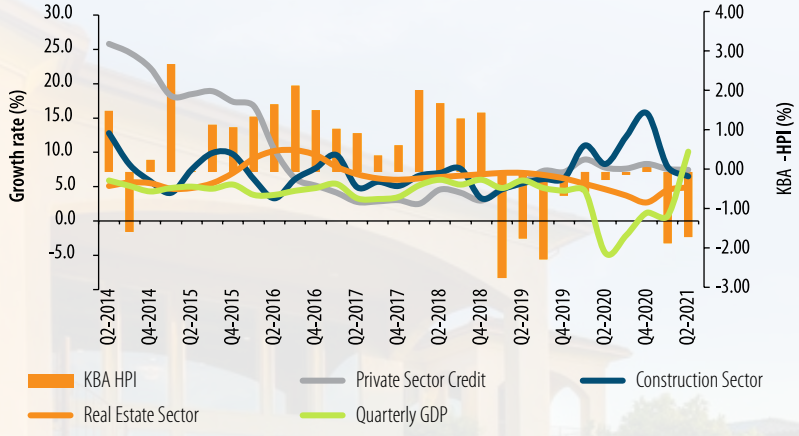
JUNE 2021 ISSUE 27

House Price Softening Trend Sustained in Q2, albeit Stronger than First Quarter

House prices continued to decline in the second quarter of 2021, albeit by a slower rate compared to prices in the first quarter. The KBA House Price Index contracted by 1.66 percent in the second quarter of 2021, compared to a 1.82 percent contraction in the first quarter of 2021 (Figure 1), while the average price growth (unadjusted for quality) in the same period contracted by -4.20 percent[1].

The modest bounce-back in the housing market during the second quarter is on account of the dynamics of the market's fundamentals, and more importantly, the supply-demand interplay. First, and as argued in the first quarter's KBA-HPI Report, trends in the housing market co-evolve with the business and economic cycle, which in the second quarter continued to rebound. On the demand side, the real estate sector's performance in 2021 was depressed largely reflecting a slow recovery from the adverse effects of the pandemic. Still, high-frequency economic indicators suggest the economy is rebounding, and so is the recovery in the real estate sector. However, housing transactions remain muted.

Figure 1: Evolution of Sectoral GDP, Overall GDP and House Inflation (Q2-2013 - Q2-2021)



During the second quarter of 2021, the number of transactions contracted by 5.1 percent. Another possible reason for the observed price patterns is the supply-side dynamics. On the supply side, cement consumption rose to 727,478 MT in June 2021, representing a 22.9 percent annual growth compared to a 29.9 percent annual growth in March 2021 when consumption stood at 716,740 MT (**Figure 2a**).

Similarly, financing conditions for the building and construction and the real estate sectors deteriorated. Growth in

Continued on page 2...

1. The price growth, unadjusted for quality, is computed as: $(P_2/P_2 - 1)*100\%$, where P_2 is the average house price in the second quarter of 2021, and P_1 is the average house price in the first quarter of 2021.

Pic/ stephen leonardi (Unsplash)

House Price Softening Trend Sustained in Quarter 2

Technical Note

The index follows a Laspeyers index method. In this method, the index is computed by getting the ratio of the estimated current quarter price from the hedonic method (multiplied by the weights of the preceding quarter) to the price of the preceding quarter (multiplied by the respective weights of that quarter).

The weights of the quantitative variables are obtained by getting their respective mean values. For the dummy variables however, their weights are computed as the proportions of the number of houses possessing a certain attribute to the total number of houses. Thus the index is computed by the formula:

$$Index = \sum_{i=1}^{n} w_i \frac{\hat{P}_1}{\hat{P}_0} = \frac{\sum_{i=1}^{n} w_0 \hat{P}_1}{\sum_{i=1}^{n} w_0 \hat{P}_0}$$

Where; $\hat{P}_1$ is the shadow price from the estimated hedonic function for the current quarter;

$\hat{P}_0$ is the shadow prices from the estimated hedonic function for the preceding quarter;

And w_0 are the weights of the respective variables for the preceding quarter.

Figure 2a: Cement consumption

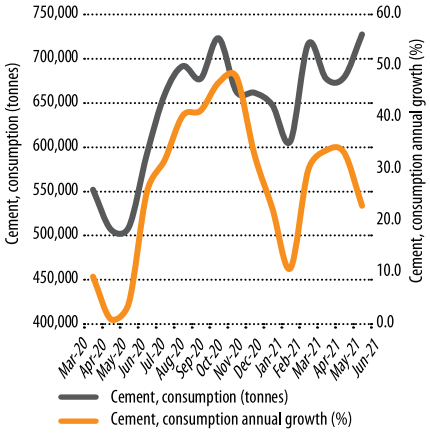
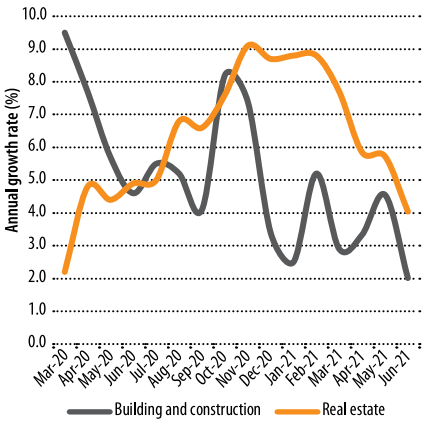


Figure 2b: Sectoral credit to the private sector (y-o-y, percent)



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lending to the building and construction slowed down to 2.0 percent in June 2021 year-on-year compared with 2.9 percent in March 2021. Similarly, lending to the real estate sector grew by 4.0 percent in June 2021 compared to 7.0 percent in March 2021 (**Figure 2b**). Overall, the intersection of the developments in demand and supply-side fundamentals of the housing market resulted in a continued market correction characterised by the softening of prices. Other major concerns during the period, included the slowdown in the conclusions of housing market transactions following the switch in April 2021 from manual processing of title transfers to an electronic system at the land registry.

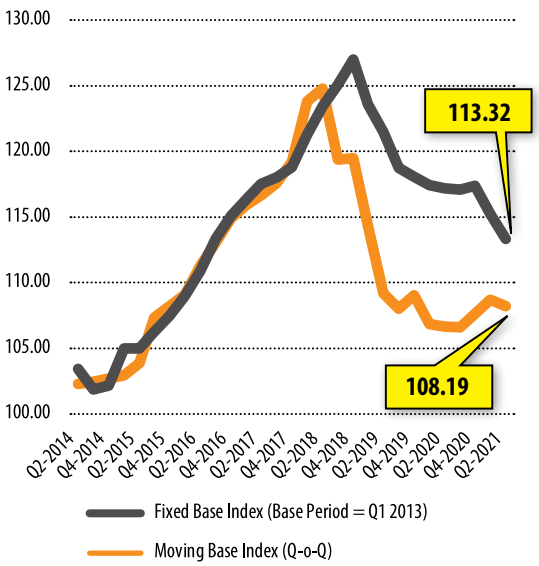
Analyses of the evolution of the specific indices of the KBA Composite Housing Price Index (KBA-HPI) indicates house prices rose by 8.19 percent in the second quarter of 2021 compared with prices in a similar period in 2013 (base period=Q1 2013) and by 13.32 percent based on the moving base index (**Table 1**, and **Figure 3**).

Table 1: Price Movement Series

Period	Index with a fixed base*	Index with a moving base
Q4-2017	119.19	118.81
Q1_2018	123.83	121.29
Q2_2018	124.78	123.42
Q3_2018	119.38	125.10
Q4_2018	119.48	127.00
Q1_2019	114.30	123.56
Q2_2019	109.17	121.47
Q3_2019	108.02	118.76
Q4_2019	107.86	118.04
Q1_2020	106.87	117.44
Q2_2020	106.66	117.20
Q3_2020	106.63	117.11
Q4_2020	107.21	117.37
Q1_2021	108.69	115.23
Q2-2021	108.19	113.32

* Base Period Q1_2013

Figure 3: Sectoral credit to the private sector (y-o-y, percent)



House transactions dominated by apartments and in the lower segment (Region 1)

In the second quarter of 2021, house transactions in the lower segment (Region 1) dominated, sustaining trends observed since the second quarter of 2020. Despite this trend, activity in Region 1 declined marginally, as activity in Region 2 and Region 3 increased. As a result, house sales transactions accounted for 45.9 percent of the total transactions surveyed in the second quarter, compared to 51.3 percent in the first quarter. On the other hand, transactions in Region 2 and Region 3 accounted for 29.7 percent and 24.3 percent, respectively (**Figure 4a**). The distribution of house transactions in each region reveals buyers' preferences as they search for affordable properties. Apartments accounted for the largest share of transactions for the second quarter in a row, representing 81.1 percent of the total transactions during the period under review, as Maisonettes and bungalows represented 13.5 percent and 5.4 percent, respectively (**Figure 4b**).

Pic/ Cytonn Photography (Unsplash)

Figure 4: Quarterly comparison of regional and house type distributions

Figure 4a: Quarterly distribution of house transactions by region (%)

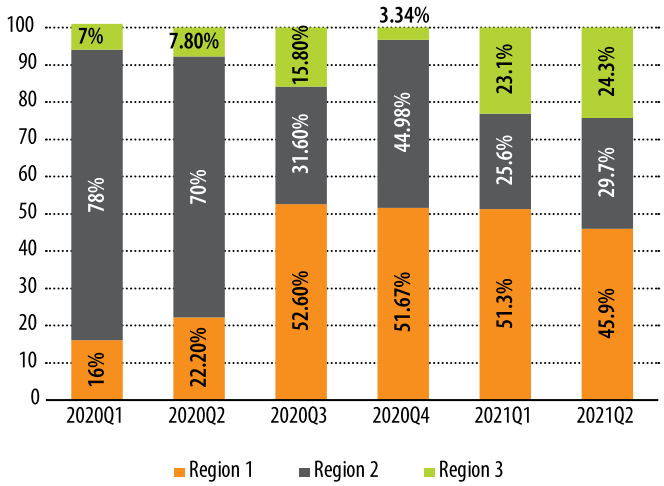
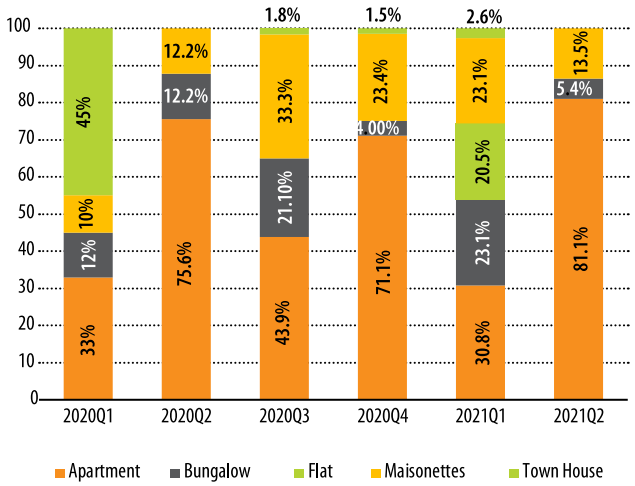


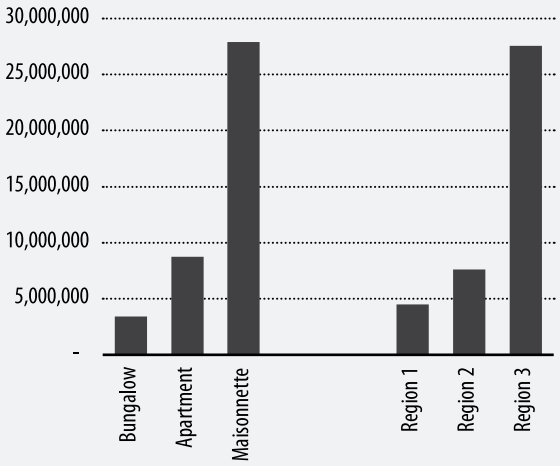
Figure 4b: Quarterly distribution of house transactions by house type (%)



House prices by region and type of house characterised by sizeable differentials

House prices across regions and house types continued to be characterised by significant heterogeneities (**Figure 5**). Across regions, while the average price in Region 1 stood at Ksh 4,509,412, that of Region 2 stood at Ksh 7,600,000, as the average price in Region 3 stood at Ksh 27,573,222 during the second quarter of 2021. Similarly, the average prices varied by house type, with the average price of an apartment, irrespective of location, standing at Ksh 8,738,667, as bungalows and Maisonettes' average prices stood at Ksh 3,400,000 and Ksh 27,891,800, respectively.

Figure 5: House prices by region and type of house



In terms of house prices and house size, across regions and house types, differentials remained uneven. Analyses of prices by house type across regions revealed that, Maisonettes in Region 3 were the most expensive, followed by those in Region 2 (**Figure 6a**). On average, the house sizes for the transactions in the period, in terms of the plinth area in Region 1 stood at 642.7 square feet, while the plinth area in Region 2, and Region 3, stood at 1,004.9 square feet, and 1,043.0 square feet, respectively. Even so, differentials of plinth area by regions also were evident. On the other hand, the average house sizes by region revealed that Maisonettes in Region 2 carried the largest average area, followed by those in Region 1 (**Figure 6b**).

Figure 6a: Average house price by region

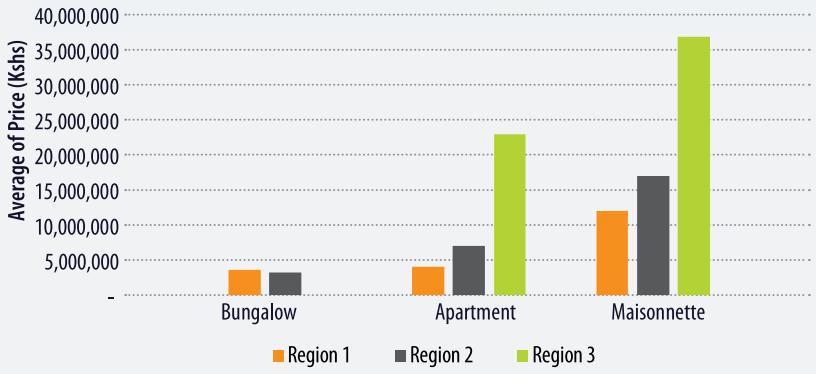
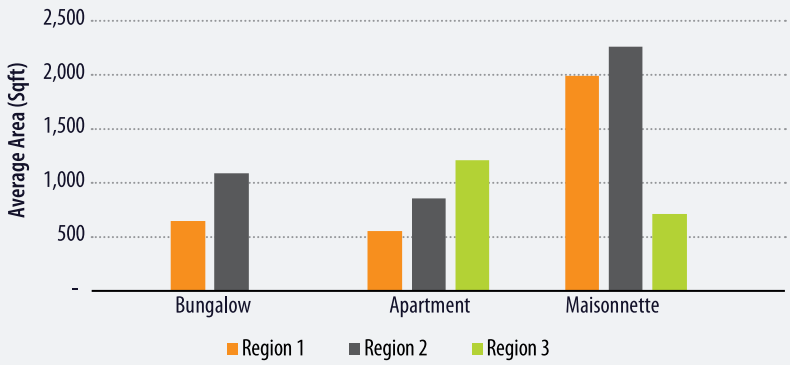


Figure 6a: Average Area by Region



Identification of the drivers of house prices using a Hedonic Regression

The computation of the KBA-HPI is underpinned by estimating the weights and the shadow prices. The weighting scheme applied to the shadow prices varies from one quarter to another and relates to the units transacted during the quarter (See **Technical Note** for details). The weights applied in the case of quantitative attributes (i.e., plinth area, number of bedrooms, number of bathrooms, and number of floors) are their respective averages, and proportions are applied as weights in the case of the qualitative attributes (i.e., type of house, and the region).

The qualitative and quantitative parameters, that drive the house price change and feed into the construction of the KBA-HPI, are based on an estimation of a hedonic regression. The regression generates the shadow prices or marginal contributions, taking cognizance of the heterogeneous nature of housing goods best characterized by their attributes[2].

Based on the current quarter's hedonic regression (presented in **Table 2**[3]), a significant portion of house prices variations is explained. The results suggest that house prices continued to reflect movements in its fundamentals. Overall, the model's goodness of fit measure; depicted by the F-statistic (F (9,29) =14.67), whose probability was below 5%, was satisfactory, suggesting that the model estimated fits the data well. More importantly, the fundamental drivers of house prices included in the model jointly explain about 75.2 percent of the observed house price variations.

The hedonic regression estimates for the second quarter of 2021 reveal two main patterns about the attributes of shadow prices, consistent with those from previous periods:

- First, the structural characteristics of the units are vital in explaining price movements, especially the plinth area. An additional 10 percent increase in the plinth area is associated with a 4.02 percent increase in the average house prices, assuming all other factors remain the same. However, the number of bedrooms, bathrooms, and floors were insignificant during the quarter.
- Second, type of house and region were significant contrary to what was seen in quarter 1.

Pic/ SideKix Media (Unsplash)

2. Hedonic regressions recognize that a dwelling is composed of a bundle of characteristics. There is no market for these characteristics, since they cannot be solf separately, so the prices of the characteristics are not indepdendently observed. The demand and supply for the properties implicitly determine the characteristics's marginal contributions to the prices of the properties.
3. For comparison purposes, the hedonic regression estimates for the second, third and fourth quarter of 2020 are presented in Tables 3, 4 and 5, respectively annexed to this report.

Table 2: Housing Price Index Drivers for Quarter 2 of 2021

Source	SS	df	MS
Model	25.53	8.0	3.19
Residual	6.09	28.0	0.22
Total	**31.62**	**36.0**	**0.88**

Number of obs = 37.00
F(9, 29) = 14.67
Prob > F = 0.00
R-squared = 0.807
Adj R-squared = 0.752
Root MSE = 0.466

	Coef	Std. Err.	t - stats	P>|t|	[95% Conf. Interval]	
Constant	13.77	0.17	81.85	0.00	13.44	14.10
plinth area	0.402	0.146	2.750	0.010	0.103	0.701
No. of bedrooms	0.697	0.493	1.410	0.169	-0.313	1.708
No. of bathrooms	-0.760	0.687	-1.100	0.279	-2.168	0.649
No. of floors	0.399	0.338	1.180	0.248	-0.293	1.092
House Type Dummy						
Region1	-0.474	0.211	-2.250	0.033	-0.906	-0.042
Region3	1.043	0.254	4.110	0.000	0.523	1.563
House Type Dummy						
Apartment	-0.818	0.434	-1.880	0.070	-1.707	0.071
Bungalow	-0.663	0.326	-2.040	0.051	-1.330	0.004

Notes: All the Quantitative variables (Plinth Area, No. of Bedrooms, No. of Bathrooms, No. of Floors) enter the hedonic regression function in their natural logarithm. The house price is also expressed in its natural logarithmic form

Housing Price Index
Quarter 1, 2021
113.32

Table 3: Housing Price Index Drivers for Quarter 1 of 2021

Source	SS	df	MS
Model	9.33	10.0	0.93
Residual	1.55	28.0	0.06
Total	**10.88**	**38.0**	**0.29**

Number of obs = 39
F(9, 29) = 16.87
Prob > F = 0.00
R-squared = 0.858
Adj R-squared = 0.807
Root MSE = 0.235

	Coef	Std. Err.	t - stats	P>|t|	[95% Conf. Interval]	
Plinth Area	0.244	0.079	3.090	0.004	0.082	0.406
No. of Bedrooms	0.804	0.284	2.830	0.009	0.222	1.386
No. of Floors	-0.452	0.232	-1.950	0.061	-0.927	0.023
No. of Bathrooms	0.086	0.210	0.410	0.686	-0.344	0.515
Regional Dummy						
Region 1	0.041	0.104	0.390	0.698	-0.172	0.253
Region 2	0.608	0.121	5.030	0.000	0.360	0.855
House Type Dummy						
Apartment	0.284	0.122	2.330	0.027	0.034	0.533
Bungalow	-0.076	0.143	-0.530	0.598	-0.369	0.216
Flat	0.398	0.165	2.420	0.022	0.061	0.735
Town House	0.447	0.269	1.660	0.107	-0.103	0.997

Notes: All the Quantitative variables (Plinth Area, No. of Bedrooms, No. of Bathrooms, No. of Floors) enter the hedonic regression function in their natural logarithm. The house price is also expressed in its natural logarithmic form

Housing Price Index
Quarter 1, 2021 **115.23**

Table 4: Housing Price Index Drivers for Quarter 4 of 2020

Source	SS	df	MS
Model	37.02	10.00	3.70
Residual	7.18	303.00	0.02
Total	**44.21**	**313.00**	**0.14**

No. of Obs. = 314
F(8, 48) = 156.14
Prob > F = 0.00
R-squared = 0.84
Adj R-squared = 0.83
Root MSE = 0.15

Natural logarithm of Property Value	Coef	Std. Err.	t - stats	P>|t|	[95% Conf. Interval]	
Plinth area	0.28	0.04	6.80	0.00	0.20	0.36
No. of Bedrooms	0.10	0.04	2.79	0.01	0.03	0.17
Number of floors	0.19	0.04	4.92	0.00	0.12	0.27
No. of Bathrooms	-0.01	0.02	-0.39	0.70	-0.04	0.03
Age	-0.06	0.01	-4.39	0.00	-0.08	-0.03
Regional Dummy						
Region 2	0.38	0.03	13.11	0.00	0.32	0.44
Region 3	0.82	0.07	11.31	0.00	0.68	0.97
House Type Dummy						
Bungalow	-0.15	0.09	-1.73	0.09	-0.32	0.02
Maisonette	0.01	0.05	0.03	0.97	-0.10	0.11
Townhouses	-0.24	0.09	-2.61	0.01	-0.42	-0.06
Constant	13.77	0.17	81.85	0.00	13.44	14.10

Housing Price Index
Quarter 4, 2020

117.37

Table 5: Inter quarter Sub-Regional Indices (Moving Base): Q2-2013 – Q4-2020

	Region 1			Region 2			Region 3		
	Apart-ments	Bunga-lows	Maison-ettes	Apart-ments	Bunga-lows	Maison-ettes	Apart-ments	Bunga-lows	Maison-ettes
Q3-2013	99.67	100.40	99.40	102.44	100.99	100.49	98.56	105.20	102.09
Q4-2013	100.74	102.82	99.38	101.80	100.82	98.81	103.75	103.95	100.32
Q1-2014	100.45	99.38	99.67	101.63	100.91	100.91	97.70	102.58	102.58
Q2-2014	100.50	99.67	99.54	100.75	101.75	101.27	96.70	102.74	103.32
Q3-2014	99.41	100.31	100.33	100.63	101.27	99.91	98.90	102.98	100.56
Q4-2014	97.48	99.29	105.21	97.82	101.98	99.61	104.54	104.36	100.62
Q1-2015	95.20	101.54	100.95	98.67	102.01	100.25	104.67	104.92	100.71
Q2-2015	102.92	102.78	100.53	101.11	102.05	100.77	105.23	104.91	102.51
Q3-2015	103.54	103.04	101.02	104.81	102.99	101.51	105.54	105.43	104.08
Q4-2015	105.23	104.57	104.66	104.84	103.47	102.43	106.25	105.37	105.26
Q1-2016	105.56	106.49	104.87	104.22	103.30	102.58	107.05	105.96	105.37
Q2-2016	103.48	104.08	102.96	100.19	100.30	100.93	101.23	100.96	100.27
Q3-2016	104.81	104.92	104.02	103.62	101.51	102.62	103.07	102.59	104.29
Q4_2016	106.82	105.05	104.83	105.04	102.61	103.60	105.72	102.94	105.94
Q1_2017	108.63	105.81	104.96	106.75	102.81	104.27	107.49	103.27	106.24
Q2_2017	109.73	105.97	105.22	107.86	102.96	104.27	108.65	103.83	106.70
Q3_2017	110.04	106.08	105.63	107.93	103.17	105.08	109.38	103.94	107.08
Q4_2017	111.53	106.86	106.04	108.61	103.51	105.84	110.63	104.04	107.75
Q1_2018	112.39	107.16	108.82	110.07	105.58	108.03	111.41	107.04	110.08
Q2_2018	113.30	107.92	109.49	110.96	106.33	108.70	112.31	107.80	110.76
Q2_2019	103.58	100.58	104.35	102.83	.	.	.	.	107.41
Q3_2019	100.97	114.91	98.75	95.66	99.22	99.84	99.36	.	102.67
Q4_2019	102.6	87.15	101.27	.	.	101.16	99.04	.	.
Q1_2020	103.07	101.38	103.91	102.03	100.14	102.35	99.96	104.29	103.92
Q2_2020	103.04	101.22	104.85	102.10	100.57	102.14	99.91	.	103.86
Q3_2020	102.57	101.11	104.45	101.80	100.53	101.66	101.02	104.21	103.84
Q4_2020	105.26	108.06	104.47	103.89	105.13	107.00	.	108.96	110.97

Note: The dot (.) as usually denotes insufficient observations to run the regression analysis. This is even the case where Apartments were not common in Region 3.
* Definition of the Sub-regions listed overleaf ** Base period: Q1_2013

THE DEFINITION OF THE SUB-REGIONS

REGION 1
Athi River, Mlolongo, Mavoko, Nakuru, Ngong, Ruaka, Syokimau, Embakasi, Kahawa Wendani, Thika, Mtwapa, Utange, Kitengela, Kiembeni, Nyeri, Likoni, Eldoret, Ruiru, Kilifi,Thika road (Kasarani, Roysambu, Ruaraka), Meru, Bungoma.

REGION 2
Thindigua (Kiambu Road), Kiambu, South B, South C, Kabete, Komarock, Imara Daima, Membley, Buruburu, Rongai, Waiyaki Way (Uthiru, Regen, Kinoo, Kikuyu), Mbagathi road, Ngong Road, Langata.

REGION 3
Kileleshwa, Kilimani, Lavington, Westlands, Spring Valley, Riverside, Milimani (Kisumu), Milimani (Nakuru), Runda, Karen, Garden Estate, Parklands, Ridgeways, Muthaiga, Loresho, Kitisuru, Adams Arcade, Nyali, Mountain View, Nyari.

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