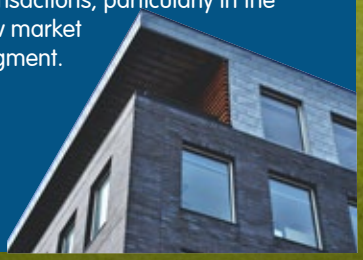
HOUSING PRICE INDEX

MARCH 2021 ISSUE 26

First Quarter Price Dips Dampening Recovery Recorded in Q4-2020

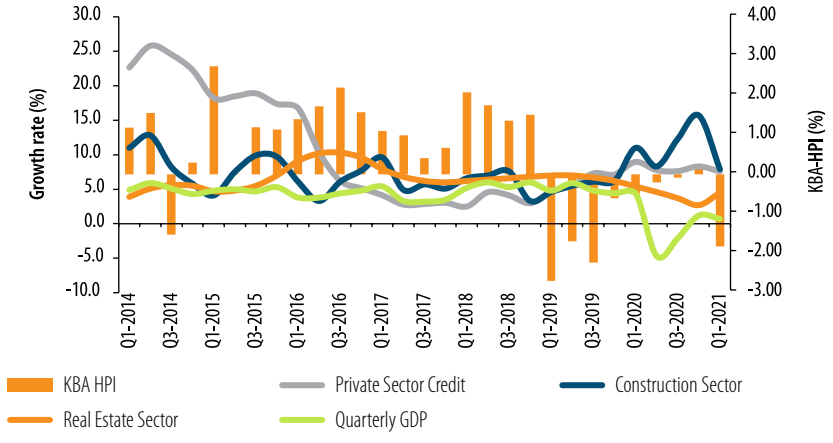
Highlights

- House prices dropped during the period reflecting a softening demand, and a continuation of housing market corrections.
- The movement in house prices reflected economic activity in general, and specific structural and regional distribution trends.
- Demand for Apartments continued to dominate house market transactions, particularly in the low market segment.



The housing market prices, that had recovered slightly in the fourth quarter of 2020, dropped in the first quarter, largely driven by softening demand. The housing prices in the first quarter of 2021 contracted by 1.82 percent on a quarter-on-quarter basis more-than-reversing the recovery recorded in the fourth quarter (when house prices rose by 0.22 percent), and reflecting a stronger dip than 0.51 percent reported for a similar period in 2020 (**Figure 1**).

Figure 1: Evolution of Sectoral GDP, Overall GDP and House Inflation (Q1-2013 - Q1-2022)



The quarter-on-quarter softening of prices reflects several factors linked to the dynamics of supply-demand interactions. But generally, we observed housing prices move in tandem with the economic cycle, reflecting the performance of the economy during the period (**Figure 1**).

On the supply side, indicators suggest a slowdown in the entry of new properties to the market, which can be attributed to a number of developments during the period. First, was the lagged effect of a

Continued on page 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.

First Quarter price dips dampening recovery recorded in Q4-2020

Figure 2: Cement consumption

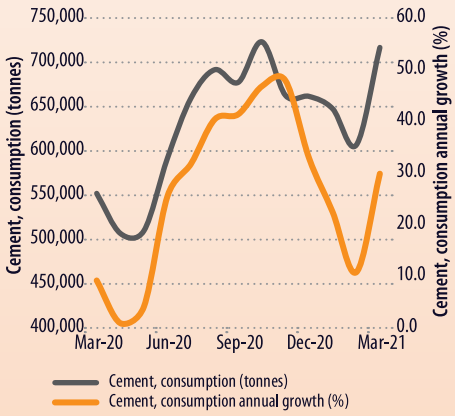
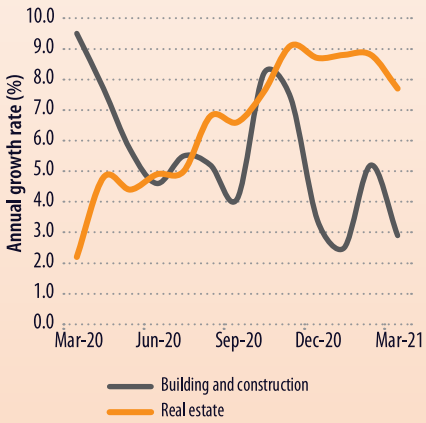


Figure 3:Sectoral credit to the private sector (y-o-y, percent)



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slowdown in cement consumption particularly from the third quarter of 2020 onwards (**Figure 2).** Second, and consistent with the decline in the other supply-side indicators, the financing conditions for the building and construction sector deteriorated, leading to private sector credit to building and construction growing at a weak rate of 2.9 percent in March 2021 on a quarter on quarter basis (**Figure 3**). As a result, the recovery of the real estate sector towards pre-pandemic vibrabcy remained feeble.

On the demand side, the performance of the real estate sector in 2020 was depressed by the overall slowdown in incomes of households as the effects of the pandemic hit. The apparent spillover of these effects to the first quarter of 2021 was evident. As a result, the concluded transactions slumped by 88.15 percent over the period. Further, following a decline in house sales in 2020, and consistent with historical trends, the downward adjustment in prices in the subsequent periods was expected. The slump in concluded transactions was also consistent with the moderation in private sector credit uptake by the real estate and building and construction sectors (**Figure 3**).

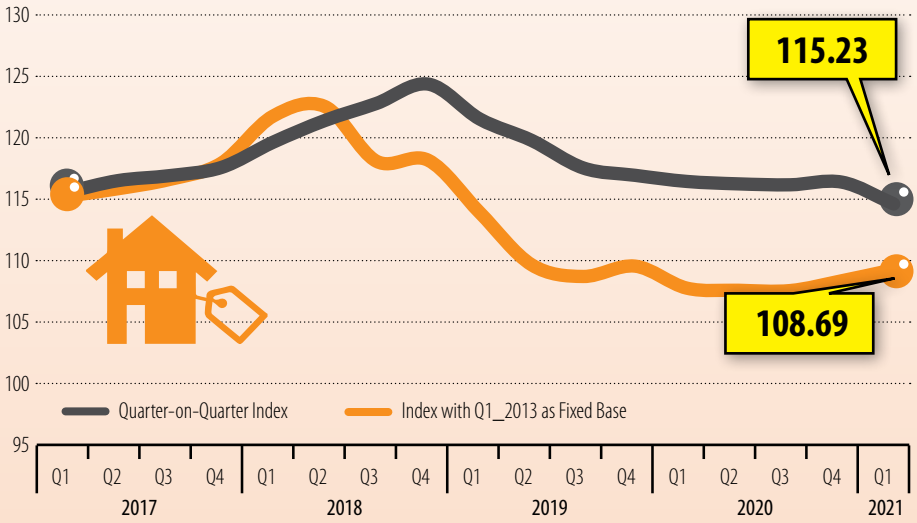
Overall, the intersection of the developments in demand and supply side fundamentals of the housing market, resulted in a continued market correction characterised by the softening of prices.

Table 1: Price Movement Series

Period	Index with a fixed base*	Index with a moving base
Q2_2017	116.67	117.52
Q3_2017	117.59	118.01
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

* Base Period Q1_2013

Figure 4: KBA – House Price Index Evolution



Analyses of the evolution of the specific indices of the KBA Composite Housing Price Index (KBA-HPI) indicates that compared with 2013, house prices rose by 8.69 percent in the first quarter of 2021 compared with prices in a similar period in 2013 (base period=Q1 2013) and by 15.23 percent based on the moving base index (**Table 1** and **Figure 4**).

Demand for Flats continued to dominate house market transactions, particularly in the low market segment (R 1)

There have been a number of notable changes in the housing market since the onset of the pandemic, with regard to region and house types. First, in terms of regional distribution of activity, the pre-pandemic dominance of transactions in region 2 waned as region picked up significantly (**Figure 5a**). During the first quarter of 2021, transactions were predominant in Region 1; on average accounting for 51.3 percent of all transactions, as Regions 2 and 3 accounted for 25.6 percent and 23.1 percent, respectively. The distribution of house transactions in each region reveal buyers' preferences as they search for affordable properties.

Second, apartments continued to account for the largest share of transactions for the second quarter in a row, but its share declined substantially from levels reported in the fourth quarter of 2020. In particular, apartments accounted for 51.3 percent of the total transactions during the period under review, as maisonettes, bungalows and townhouses represented 23.1 percent, 23.1 percent and 2.6 percent, respectively (**Figure 5b**).

Third, analyses of house price differentials show that the differentials remained uneven across regions and house types. Across regions, while the average price in region 1 during the quarter stood at Ksh 9,212,240.3, that of region 2 stood at Ksh 8,277,500.0, as the average price in region 3 stood at Ksh 20,261,111.1. The average price per-square foot was also highest in region 3 (at Ksh 10,711.4) followed by region 2 (at Ksh 7,468.6) and region 3 (Ksh 6,096.2).

By house type, the average price of an apartment irrespective of location, stood at Ksh 11,859,126.98, as bungalows, maisonettes and townhouses respectively stood at

Demand for Flats continued to dominate house market transactions, particularly in the low market segment (R 1)

Figure 5: Quarterly comparison of regional and house type distributions

Figure 5a: Quarterly distribution of House Transactions by region (%)

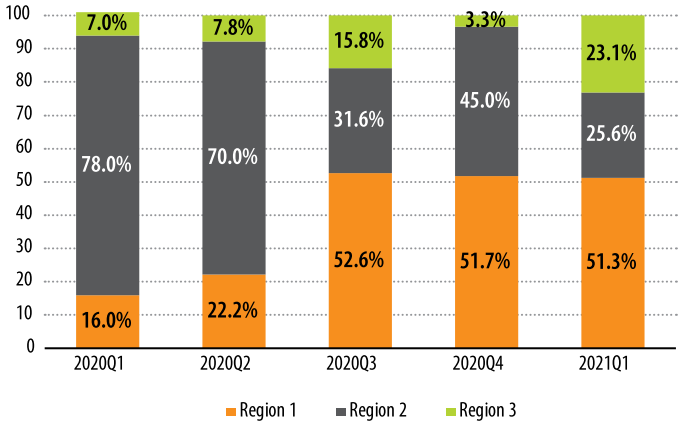
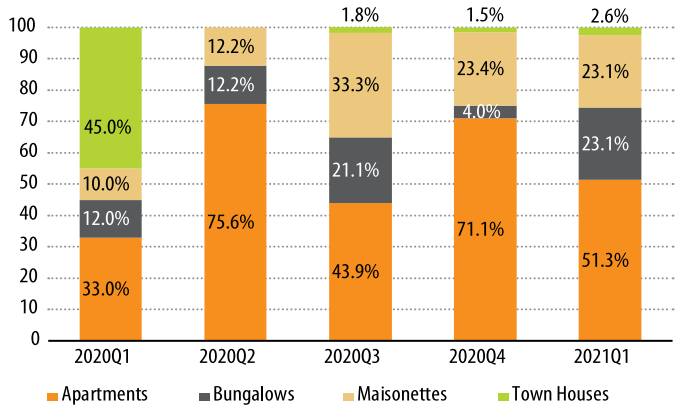


Figure 5b: Quarterly distribution of House Transactions by house type (%)



Ksh 7,756,250.00, Ksh 12,035,822.51, and Ksh 35,000,000.00.The average prices, however, varied from one region to another as shown in **Figure 6.**

Based on house sizes - in terms of plinth area- the average house sizes for units sold during the quarter also varied considerably by house type. For instance, while maisonettes average house size stood at 5,170.7 square feet, townhouses posted an average size of 2,756.0 square feet, as apartments and bungalows transacted were on average 1,347.3 square feet and 1,431.0 square feet, respectively.

Analyses of house average sizes by region for houses transacted during the first quarter, revealed that maisonettes in region 1 carried the largest average area, followed by townhouses in region 3. A majority of the rest of the houses transacted across the regions carried plinth areas below 2,000 square feet. In particular, the average area stood at 2,970.3 square feet in region 1, while that of region 2 and region 3 was 1,250.65 square feet and 1,911.73 square feet, respectively. There was a notable trend in the increase in the average plinth area, especially in the apartments segment and as one moves from region 3 to region 1. This points to a shift in demand as buyers seek more spacious properties in more affordable areas.

Figure 6a: Average Plinth Area by Region

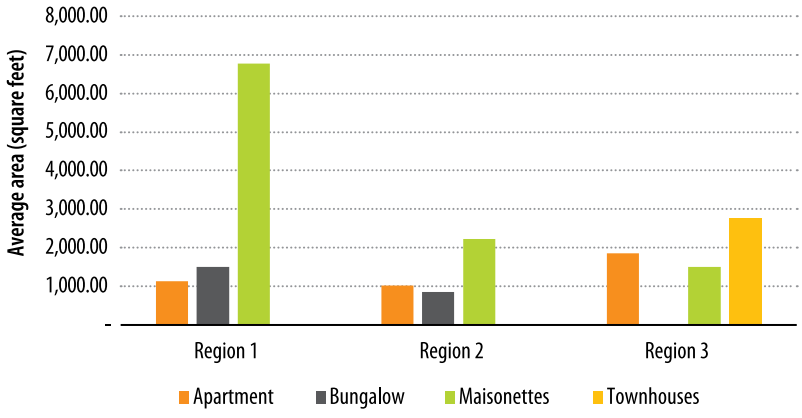
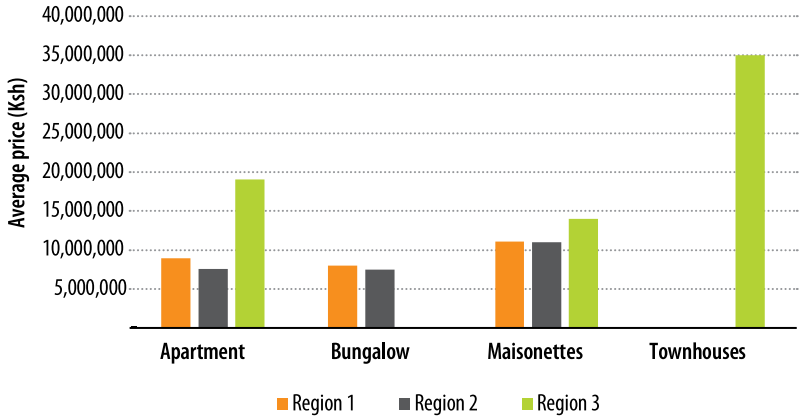


Figure 6b: Average House Price by Region



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 cognisance of the heterogeneous nature of housing goods best characterised by their attributes .

Based on the results of the current quarter's hedonic regression (presented in **Table 2**), a significant portion of house prices variations are explained. The results suggest that house prices continued to reflect movements in its fundermentals. Overall, the model's goodness of fit measure- depicted by an F-statistic (F9,29) =16.87 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 80.7 percent of the observed house price variations.

The hedonic regression estimates for the first 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. In particular, prices increase with the floor (plinth) area, with an additional 10 percent increase in the plinth area associated with a 2.4 percent increase in the average house prices. This result holds strongly for apartments/ flats and townhouses, not for bungalows. Similarly, a unit's number of bedrooms and floors is also essential. A 10 percent increase in the number of bedrooms in a house increases the average price by 8.0 percent, holding other factors constant. However, as the number of floors in a house increases by 10 percent, the average unit price drops by 4.52 percent (for the same region and house type), ceteris paribus.

- Second, non-structural attributes are also significant drivers of house prices by type and across regions. For instance, average prices were the lowest in region 3, compared to region 2. This mirrored observations over a similar period in 2019 and Quarter 3 of 2020.

1. 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.
2. 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 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 3: 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 4: Housing Price Index Drivers for Quarter 3 of 2020

Source	SS	df	MS
Model	6.25	8	0.78
Residual	3.78	48	0.08
Total	**10.04**	**56**	**0.18**

No. of Obs. = 57
F(8, 48) = 9.92
Prob > F = 0.00
R-squared = 0.62
Adj R-squared = 0.56
Root MSE = 0.28

Natural logarithm of Property Value	Coef	Std. Err.	t - stats	P>|t|	[95% Conf. Interval]	
Constant	15.32	0.64	23.8	0.00	14.03	16.61
Plinth area (LN)	-0.04	0.09	-0.44	0.66	-0.22	0.14
No of bedrooms	0.05	0.08	0.72	0.48	-0.10	0.21
No of bathrooms	0.27	0.08	3.3	0.00	0.11	0.43
No of floors	0.02	0.13	0.19	0.85	-0.24	0.29
Regional Dummy						
Region1	-0.19	0.09	-1.98	0.05	-0.37	0.00
Region3	0.35	0.14	2.42	0.02	0.06	0.64
House Type Dummy						
Apartment	0.09	0.53	0.17	0.86	-0.98	1.16
Maisonette	0.28	0.15	1.88	0.07	-0.02	0.57

Housing Price Index
Quarter 3, 2020

117.11

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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