Kenya Shilling Valuation

August 2017

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I. KES Performance Review

Kenya Shilling vs USD Trend Analysis - 5 Years

Over the past 5 years, the shilling has depreciated at a CAGR 2.7% p.a. against the US Dollar
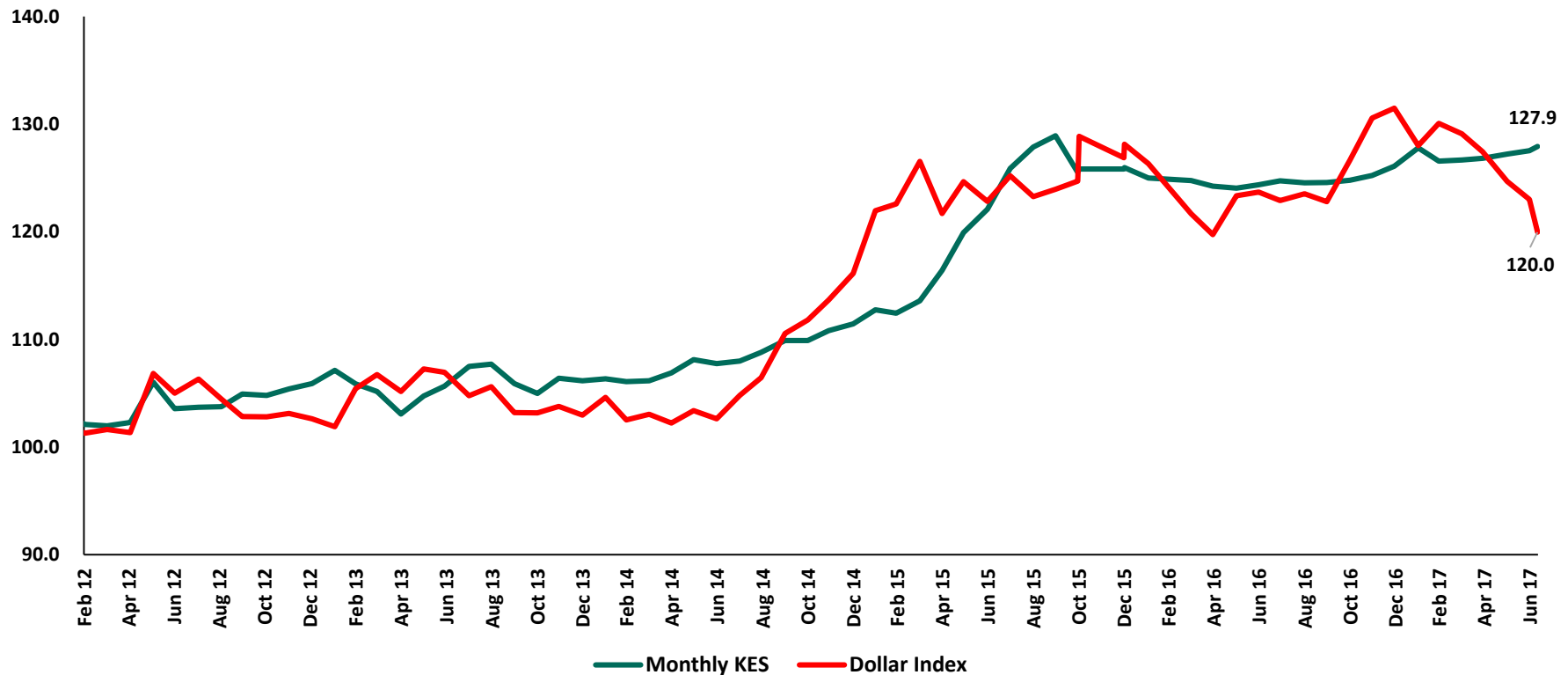

- Over the past 5 years, the Kenya Shilling has depreciated against the US Dollar by 2.7% p.a.
- The Kenya Shilling has depreciated against the US Dollar by 1.4% since the turn of the year to close at Kshs 103.9 from Kshs 102.5 at the end of 2016, due to increased dollar demand from oil importers

II. KES Drivers Review

Balance of Trade (BOT)

Kenya recorded an improvement of 14.5% in the balance of trade deficit in 2016 but we expect 2017 to worsen by 37.2% in balance of trade deficit as a result of acceleration in imports
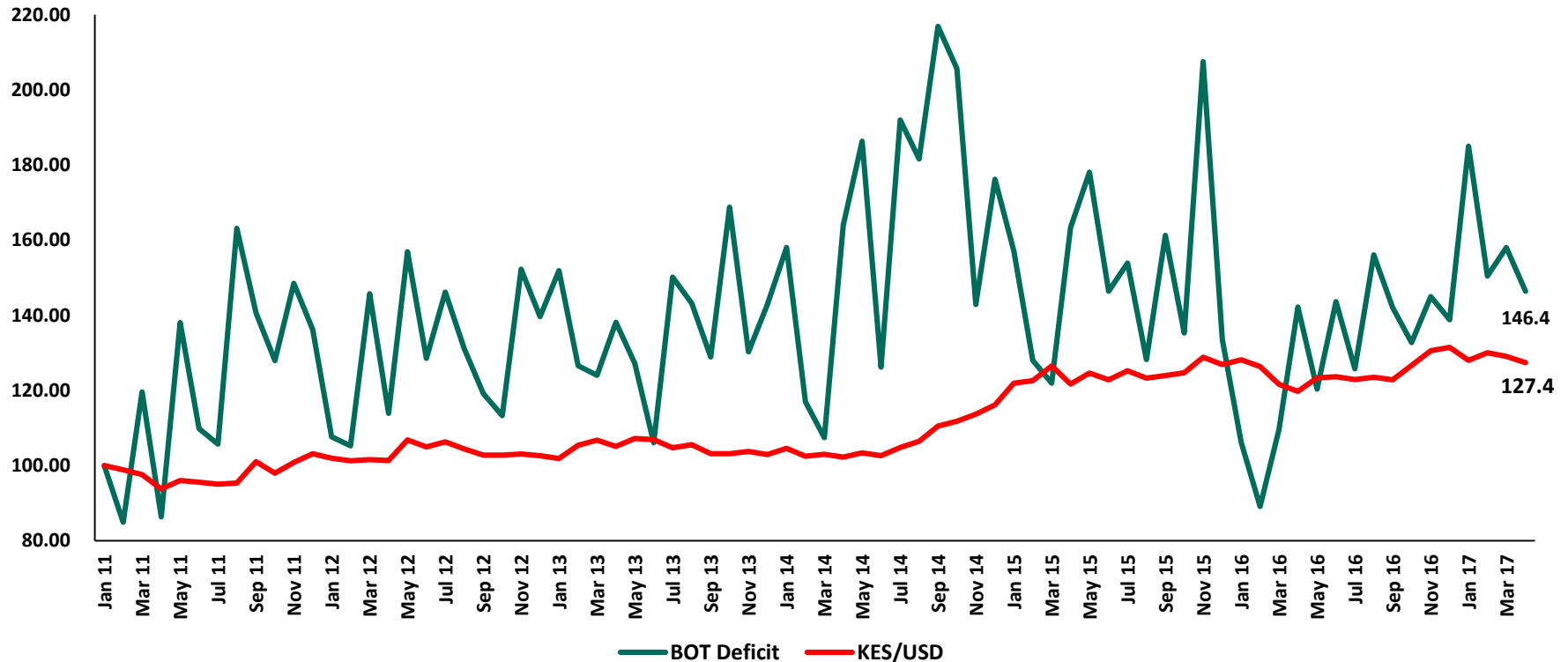
- Balance of trade has a weak negative correlation of 0.25 to the value of the shilling indicating that a worsening in the value of BOT will lead to an depreciation of the shilling

- For 2017, the BOT is expected to worsen by 37.2% due to an expanded import bill thus the shilling is set to weaken

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Diaspora Remittances and Forex Reserves

Diaspora remittances increased by 11.4% in 2016 and we expect 2017 to see an increase of 9.6% in diaspora remittances while forex reserves currently stands at USD 7.8 bn

Legend: KES/usd — Forex Reserves and Remittances
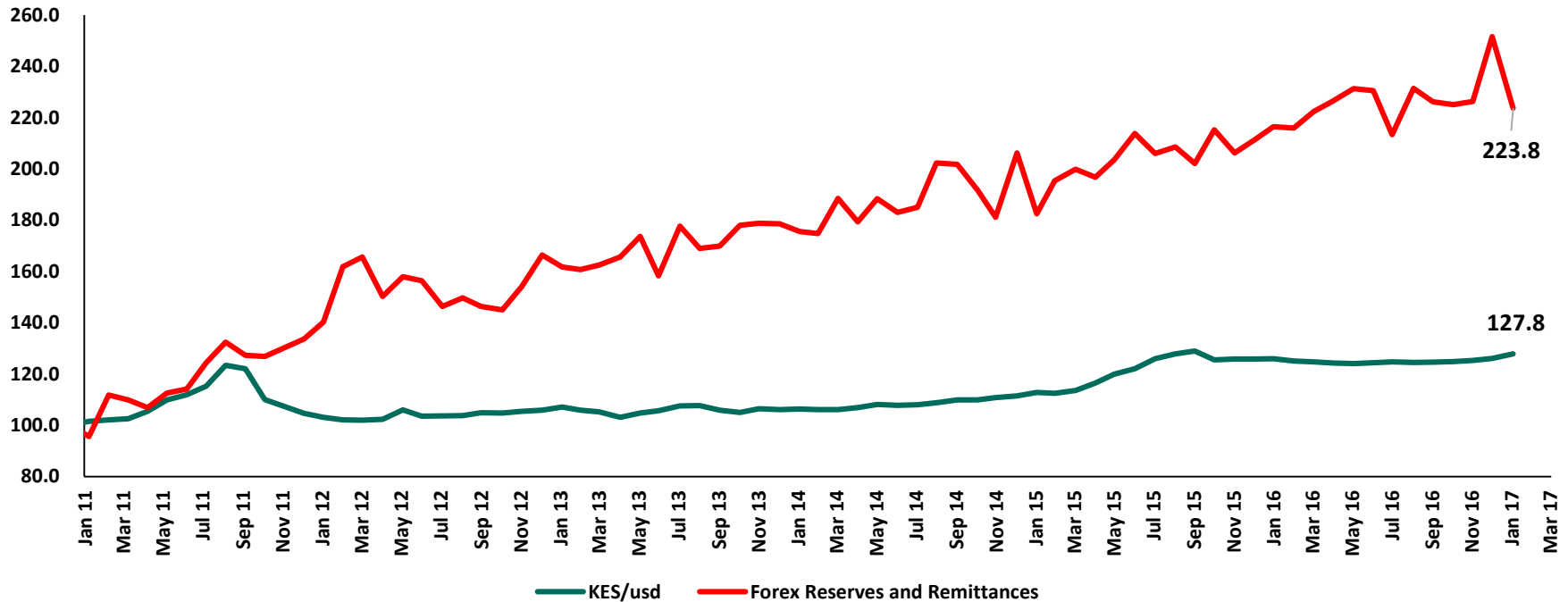
- Diaspora remittances have a strong positive correlation of 0.73 to the value of the shilling indicating that an increase in the value of remittances will lead to an appreciation of the shilling

- For 2017, the growth of 9.4% is below the historical average indicating that the shilling will have minimal support from diaspora remittances

- Forex reserves are expected to decline going forward as the CBK props up the shilling

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Currency Drivers Impact

The currency is artificially supported by forex reserves thus reducing the impact of the worsening balance of trade deficit

Legend: Trade Defict — Forex Reserves and Remittances — KES/USD
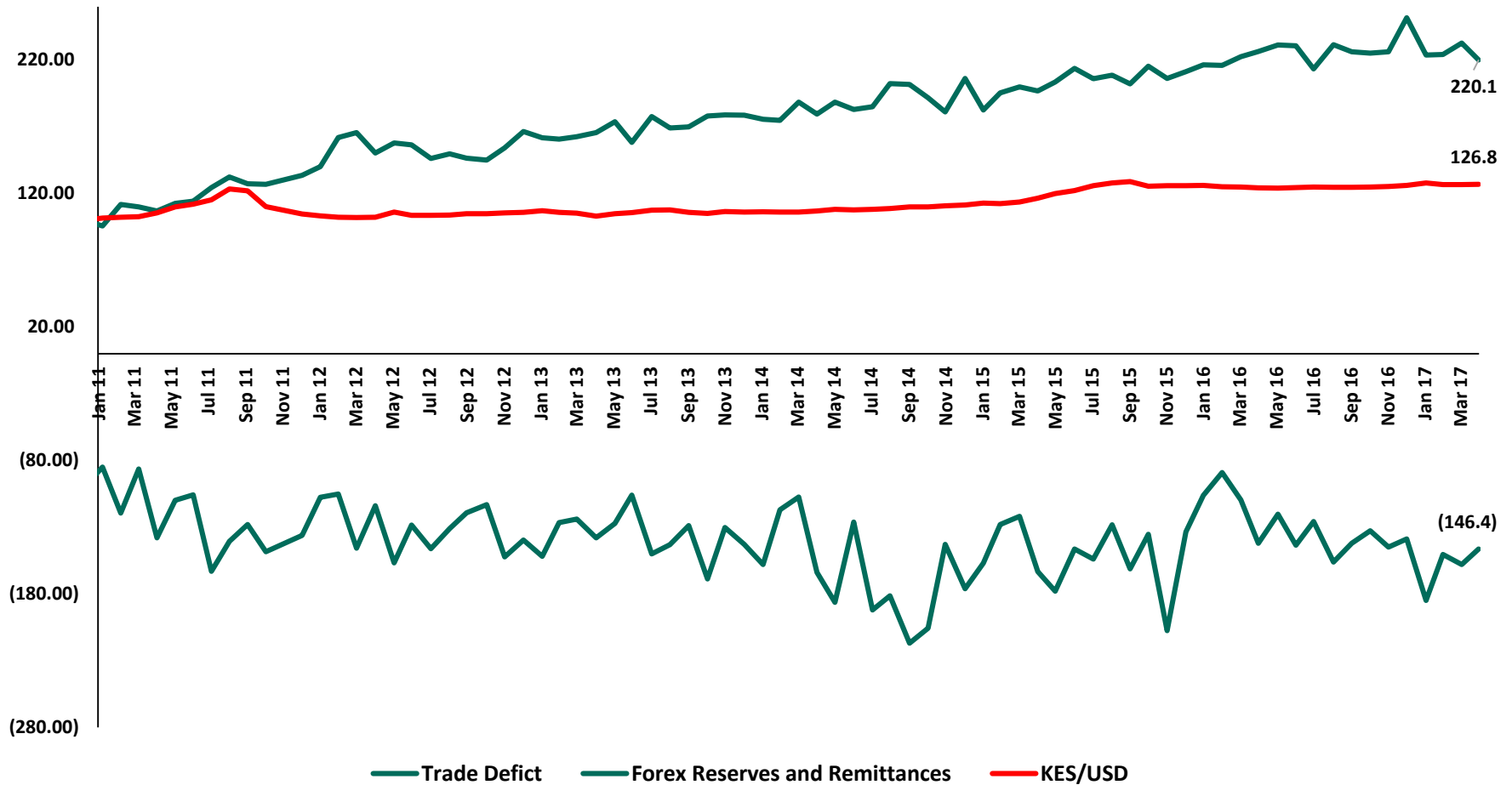
III. Valuation Rationale

Valuation Rationale

The value of the KES/USD was derived through weighting of Multilinear Regression Price, Interest Rate Parity Price, and Purchasing Power Parity Price

- The purpose of the Kenya shilling valuation is to predict the direction of the currency and identify possible risks or opportunities as a result of the movement in currency

- To determine the futuristic value of the currency, the following methodology was applied;

  a) Multilinear Regression of currency drivers – through regression of the key currency drivers, the correlation amongst the drivers to the shilling were established and through a linear equation ($y = mx + fx + bx + rx + c$) the value of Kenya shilling per US dollar was derived

  b) Interest Rate Parity (IRP) – through this currency pricing method, the uncovered parity due to differential in interest rates is established and the value of currency is projected through the assumption that the difference in interest rates between two countries (i.e. Kenya and US) is equal to the expected change in exchange rates between the countries' currencies

  c) Purchasing Power Parity (PPP) - through this currency pricing method, the uncovered parity due to differential in prices of goods and services (inflation) is established and the value of currency is projected through the assumption that the difference in prices of goods and services between two countries (i.e. Kenya and US) is equal to the expected change in exchange rates between the countries' currencies

  d) At the end to obtain the value of currency, the three pricing methods were weighted to provide a relative exchange rate to the US dollar

IV. Valuation Summary

Multilinear Regression

The three currency drivers have a positive correlation of 0.75 to the shilling observing data over the past 6 years

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.75
R Square	0.56
Adjusted R Square	0.54
Standard Error	5.17
Observations	76

ANOVA

	df	SS	MS	F	Significance F
Regression	3	2,411.8	803.9	30.0	0.0
Residual	72	1,927.3	26.8		
Total	75	4,339.1			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	65.6	3.75743	17.45693	0.00000	58.10292	73.08352	58.10292	73.08352
BOT	0.00002	0.00004	0.56721	0.57234	(0.00006)	0.00011	(0.00006)	0.00011
Remmittances	0.00035	0.00007	4.97961	0.00000	0.00021	0.00049	0.00021	0.00049
Forex Reserves	(0.00192)	0.00117	(1.64400)	0.10454	(0.00425)	0.00041	(0.00425)	0.00041

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Multilinear Regression

Multiple Regression gives a price of KES 105.0 per USD as at December 2017 , indicating a depreciation of 2.4% during the year

Regression Statistics	
Multiple R	0.75
R Square	0.56
Adjusted R Square	0.54
Standard Error	5.17
Observations	76

Currency Driver	Coefficients
Intercept	65.6
BOT	0.00002
Remittances	0.00035
Forex Reserves	(0.00192)

- The multilinear regression equation is; $KES/_{USD} = 65.6 + 0.00002(BOT) + 0.0004(DR) - 0.002(FR) - 3.8$

Date	Balance of Trade (BOT)	Diaspora Remittances (DR)	Forex Reserves (FR)	Projected KES Value	Standard Error
Dec-17	(101,377.5)	171,253.6	7,532.8	**105.0**	3.8
Nov-17	(108,391.3)	168,798.0	7,608.9	**103.8**	3.8
Oct-17	(99,062.9)	164,888.5	7,685.7	**102.5**	3.8
Sep-17	(106,435.3)	165,833.8	7,763.4	**102.5**	3.8
Aug-17	(115,377.2)	170,212.9	7,841.8	**103.7**	3.8

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Interest Rate Parity Pricing (IRP)

IRP gives a price of KES 106.4 per USD as at December 2017, indicating a depreciation of 3.8%

Currency in Kenya	Kenya Shilling
Interest rate in US (Dec 2016)*	2.4%
Interest rate in Kenya (2016)*	14.1%
New interest rate in US (Dec 2017)*	2.0%
New interest rate in Kenya (Dec 2017)*	13.5%
Spot rate (S) -KES per unit of USD	KES 102.5

The spot rate of the KES would be expected to depreciate to a greater degree based on larger interest rate differentials

Output	Valuation KES/USD	
	Dec-16	Dec-17
Adjustments in exchange rate	11.4%	11.3%
Future spot rate (S_t)	KES 114.2	KES 114.1
Variance adjustment**	7.7	7.7
Adjusted Future spot rate (St)	KES 106.5	KES 106.4

* * The variance adjustment is derived from 5-year historical variance of the actual exchange rate and projected IRP currency projection

* 10-Year Treasury bond yield

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Purchasing Power Parity Pricing (PPP)

PPP gives a price of KES 105.0 per USD as at December 2017, indicating a depreciation of 2.5%

Currency in Kenya	Kenya Shilling
Dec 2016 Inflation rate in US	2.1%
Dec 2016 Inflation rate in Kenya	6.3%
Expected inflation rate in US (Dec 17)	1.6%
Expected inflation rate in Kenya (Dec 17)	7.0%
Spot rate (S_0) - KES per unit of USD	KES 102.50

The spot rate would be expected to depreciate to a greater degree based on larger inflation differentials

Output	Valuation KES/USD	
	Dec-16	Dec-17
Adjustments in exchange rate	4.1%	5.3%
Future spot rate (S_t)	KES 106.7	KES 107.9
Variance adjustment**	2.9	2.9
Adjusted Future spot rate (St)	KES 103.8	KES 105.0

**The variance adjustment is derived from 5-year historical variance of the actual exchange rate and projected PPP currency projection*

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Valuation Summary

The shilling is expected to depreciate by approximately 2.8% in the course of the year

Valuation Summary:	Implied Exchange Rate	Weighting	Weighted Value
PPP	105.0	25.0%	26.3
IRP	106.4	25.0%	26.6
Currency Drivers (Regression)	105.0	50.0%	52.5
Fair Value (December 2017)			**105.3**
KES/USD July 2017			**103.9**
KES/USD Dec 2016			**102.5**
Appreciation/(Depreciation) YTD			**(1.4%)**
Appreciation/(Depreciation) Y/Y			**(2.8%)**

- On a weighted basis, the shilling is expected to depreciate by 2.8% during the year and close at KES 105.3 per USD

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Q&A