Interactions between Exchange Rate and Financial Performance Indicators in Nigeria Beer Industry: Evidence from Nigeria Breweries Plc

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Doi:10.5901/ajis.2014.v3n6p341

Abstract

The study aims at evaluating the nature and magnitude of the interactions between foreign exchange rate and selected financial performance indicators in Nigeria beer industry from 2000 to 2013. Granger Causality procedure, 2-step cointegration and error correction model of Engle and Granger and correlation approach was adopted in the analysis. The Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) procedures were applied to test for series stationary. All the series were found non stationary but achieved stationary at second difference. Earnings Per Share has a short term negative and insignificant effect while prices of equity shares, net asset value per share and price-earnings ratio are positively and insignificantly related to foreign exchange rate in the short run. All the variables shared negative and insignificant long run relationship with exchange rate. There is a unidirectional causality running from earnings per share to exchange rate and from exchange fluctuations rate to net asset value per share. The implication of the findings is that foreign exchange rate adversely affects earnings of firms in Nigeria brewery industry. Growth in earnings of firms in Nigeria brewery industry can cumulatively contribute to lowering the rate at which naira exchanges for other foreign currencies.

Keywords: *Exchange Rate, Performance, Beer, Cointegration, Causality, Indicators.*

1. Introduction

The need for policy makers at both micro and macroeconomic levels to have sufficient information as to the interactions of foreign exchange rate and key financial performance indicators is very crucial especially in the brewery sector. Citing Dornbusch and Fischer (1980), Nath and Samanta (2003) submits that under the goods market approaches, movements in foreign exchange rates influences the competitiveness of a firm, the value of the earnings, it's transaction exposure and cost of its funds as many companies borrow in foreign currencies to fund their operations. In support, Phylaktis and Ravazzolo (2005) argues that aside the economic exposure, which arises from variations in firm's discounted cash flows anytime foreign exchange rates fluctuate, companies also face transaction exposure due to gains or losses emanating from settlement of investment transactions stated in foreign currency terms.

Nigerian naira depreciated drastically against the united states' dollar from 2006 downwards as a result of decrease in foreign exchange inflows due to remarkable decrease in the demand for oil (the country's major source of foreign reserve); reduced inflow from independent sources; increased repatriation of investments by foreign investors and negative accretion to foreign reserve (Zubair, 2013). Citing Zakaree(2012), Inyiama and Ekwe(2014) opine that the growth and development of the economy is largely determined by sound fiscal and monetary policies which by extension influences international trade and investment as well as the growth of public and private sector of the economy.

However, Okwo and Ugwunta (2012) while citing Ogbadu (2000) argues that one of the major problems facing manufacturing companies in Nigeria, including the brewery sector, is the growing trend of high input costs which erodes their bottom line and leads to intermittent interruptions in their operational capacity. This trend was observed to have led to the closing down of production facilities by many of the brewery firms in Nigeria since they could no longer break even. Glauben and Loy (2008) argue that variations of currency values as a consequence of fluctuations in foreign exchange rate, work as cost or profit shifters to expose the pricing behavior of the beer producing firm.

Khan, Akhatar and Rana (2002) emphasized that exchange rate exerts strong influence on the balance of trade, production levels of manufacturing firms, mode of resource allocation to key sectors, as it responds to exogenous factors and shocks triggered by monetary, fiscal and other policies. Citing Dornbusch and Fischer (1980), Phylaktis and Ravazzolo (2005) explained that the flow oriented models of exchange rate determination affirm that currency

movements affect international competitiveness and balance of trade position and as a result, the real output

of the economy and consequently the current and future cash flows of companies; which could be measured by financial performance indicators.

This study aims at examining the interactions between foreign exchange rate and selected financial performance indicators such as earnings per share, price/earnings ratio and net asset value per share using Nigeria Breweries Plc as a test case. The rest of the paper is organized into four distinct sections: Section 2, reviews related literature; Section 3 establishes the methodology for data analysis; section 4 presents and discusses the empirical results while section 5 summarizes and finally concludes.

2. Review of Related Literature

Euromonitor (2014) observed that new lifestyle trends are globally encouraging a broad shift away from heavy drinking of beer and associated products as health consciousness increases. Fashion trends has also encouraged alternative drinks, such as red wine, Champaign and bottled water. In Nigeria, the slogan 'if you drink, don't drive and if you drive, don't drink' is actually stepping down the rate of beer intake. However, despite all these negative campaigns, the beer industry in Nigeria, more than ever before is witnessing a boom having contributed about 28 percent of Manufactured Value Added (MVA) and providing direct employment for over 30,000 persons and indirect employment close to 300,000 Nigerians and expatriates as argued by Okwo and Ugwunta (2012) while citing Ola (2001).

The brewery industry in Nigeria is highly competitive, mostly in terms of quality and price of beer brands. This could be the reason why firms in the industry are always reluctant in increasing the price of their products even as supply and demand for their products fluctuate but rather stick to a prevailing price for a long time. Goldberg and Hellerstein (2007) submits that the managerial time to determine a new optimal price, the cost of printing new price tags and of advertising a new price as well as the risk of losing long-term customers when the price increases are reasons why firms stick to their prices even when the bottom line is being eroded. However, before the banning of barley importation by Federal Government of Nigeria in 1988, some firms in Nigeria brewery sector import the product from independent maltsters from the European Union, Australia and Canada.

The relationship between equity returns and currency exposure for a sample of U.S., U.K. and Japanese banks and insurance firms was studied by Gounopoulos, Molyneuk, Staikouras, Wilson and Zhao(2013) using the VAR-BEKK methodology. The result indicates that U.S. (Japanese) banking sector equity returns are negatively related to changes in foreign currency value while equity returns of U.S./U.K. insurers are negatively linked to changes in the value of Japanese Yen. Overall, the negative relationship between the foreign currency value and bank/insurance equity returns supports the "flight to quality" hypothesis from the U.S./U.K. to Japan. Electronic copy available at: http://ssrn.com /abstract=1971540

The level of foreign exchange exposure and its determinants in Indian firms was examined by Kanagaraj and Ekta Sikarwar (2011). It was found that only 16 percent of the firms are exposed to exchange rate exposure at 10 percent level of significance. About 86 percent of the firms are negatively affected by an appreciation of the rupee which confirms that Indian firms are net exporters. On the determinants of exchange rate exposure, the study reveals that export ratio is positively and hedging activity is negatively related to the exchange rate exposure of pure exporter firms.

Using a simultaneous equation model within a fully specified macroeconomic model, and a vector-autoregressive model, Eme and Olugboyega (2012) analysed the impact of exchange rate on macroeconomic aggregates in Nigeria. The research examines the possible direct and indirect relationship between the real exchange rates and GDP growth. The results reveal that there is no evidence of a strong direct relationship between changes in the exchange rate and GDP growth but rather, Nigeria's economic growth has been directly affected by fiscal and monetary policies.

Doidge, Griffin and Williamson (2002) re-examines the nature and the economic significance of the exchange rate to firm value relation and found that firms' foreign activity is broadly and significantly related to exchange rate exposure and that after controlling for this activity, large firms are more sensitive to currency movements than small firms. The study further reveals that firms with high international sales outperform those with no international sales during periods of large currency depreciations. However, exchange rate movements have an economically significant impact on firm value in ways that are consistent with theory.

Sensitivity of foreign exchange exposure and its determinants was studied by Agyei-Ampomaha, Mazouzb and Yin (2012) using different estimation methods. The study reveals that the determinants of currency exposure are model-dependent while the cross-sectional results suggest very little or no relationship between firm-specific factors and currency exposure.

Zakaria (2013) in a related study examines the impact of exchange rate volatility on trade using regression analysis of standard export demand models while exchange rate volatilities were measured by GARCH(1,1) models. The results from regression analysis show that Malaysian exports to the US and Japan are significantly related with exchange rates volatility. The impact of exchange rate volatility on Malaysia export to US was found negative; while for Japan, it's positive. Malaysia's export to the UK and Singapore was found not significantly related to the volatility in the exchange rates. The findings from this study clearly indicate that the relationship between export performance and exchange rates volatility is ambiguous.

AR(k)-EGARCH(p,q) models was employed by Jamil, Streissler and Kunst(2012) as they explore the impact of exchange rate volatility on industrial production before and after the introduction of common currency for eleven European countries included in European Monetary Union and for four European countries that did not adopt 'Euro' as common currency. They conclude that all the countries enjoyed benefits after the introduction of common currency by reduction in negative impacts of real exchange rate volatility.

Huchet-Bourdon and Korinek (2011) examines the impact of exchange rates and their volatility on trade flows in China, the Euro area and the United States in agriculture, manufacturing and mining. It finds that exchange volatility impacts trade flows only slightly. Exchange rate levels, on the other hand, affect trade in both agriculture and manufacturing and mining sectors but do not explain in their entirety the trade imbalances in the three countries examined.

3. Methodology

The study adopts the Ferson and Harvey (1998) Asset Pricing Model as the theoretical Framework. The Engle-Granger (1987) two-step error correction model procedure discussed in Rao (2005); cited and adopted in Abraham (2013) is employed for model estimation. The models are as specified below:

$$\Delta EXCHRATE_t = a_0 + a_1 EPS_t + a_2\, RES_{t-1} + \varepsilon_t \quad \ldots\ldots(1)$$

$$\Delta EXCHRATE_t = b_0 + b_1 NAVPS_t + b_2\, RES_{t-1} + \varepsilon_t \quad \ldots\ldots(2)$$

$$\Delta EXCHRATE_t = c_0 + c_1 SHPRICE_t + c_2\, RES_{t-1} + \varepsilon_t \quad \ldots\ldots(3)$$

$$\Delta EXCHRATE_t = d_0 + d_1 P/ERATIO_t + d_2\, RES_{t-1} + \varepsilon_t \quad \ldots\ldots(4)$$

Where:

- Δ represents the first difference computation on the respective variables;
- a_1, b_1, c_1, and d_1 denote the coefficients indicating the short run equilibrium relationship linking the variables;
- a_2, b_2, c_2, and d_2 denote the coefficient indicating the long run relationship linking the variables with a priori expectation of -1;
- U_{t-1} or RES-1 is the residual obtained from the linear regression of variables integrated in order 1(1). The residual is lagged by one to fulfill the requirement of the granger representation theorem.
- ε_t, v_t, u_t and e_t are the disturbance term for the models.

Table 1: Description of Variables

EXCHRATE	Exchange Rate
EPS	Earnings Per Share
NAVPS	Net Asset Value Per Share
P/E RATIO	Price – Earnings Ratio
SHPRICE	Share Price
RES	Residual

In Granger representation theorem as opine by Engle and Granger (1987) and cited in Abraham(2013), cointegration was referred to as a linear combination of two non-stationary variables which are integrated of the same order. Stationary of time series data has to be achieved to avoid spurious regression results, Time series data is said to be stationary if its mean and variance are constant over time, and the value of the covariance between the two time periods depends only on the distance *k* (lag) between the two time periods and not the actual time *t* itself and that the expected value of the

time series should, therefore be constant and finite (Baumohl and Lyocsa, 2009).

Therefore, the variables under study are first tested to determine their order of integration through unit root test applying the Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) procedures. The view by some researchers that Augmented Dickey Fuller test have a low power in differentiating a situation of stationary and near stationary, gave rise to Phillips-Perron (PP) test while Kwiatkowski-Phillips-Schmidt-Shin (KPSS) was a check for robustness. If the variables are integrated of the same order, there will be likelihood of a cointegration but if the integration is of different orders, the variables may not be cointegrated. If cointegration is established among the variables, then the second step of Engle and Granger (1987) procedure could be specified as an Error Correction Model (ECM) representing each equation in the study. The procedure demands that two variables only will be considered at a time.

However, Johansen (1988) and Johansen and Juselius (1990) developed the maximum likelihood procedure for multivariate cointegration testing. The two basic test statistics in this procedure are the trace test and the maximal eigenvalue test. This procedure is only applied when there are more than two variables and these characteristics make it more robust for such models with above two variables only. The Engle and Granger two – step procedure is adopted for the study.

4. Unit Root Test

The Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) procedures are applied in testing for existence of unit root and by extension, the order of integration of the variables. This will help to determine whether the variables are likely to be cointegrated. The graphs below were plotted to give the researcher initial idea as to the presence of unit root in the time series data. The graphs in Figure 1, clearly show that the variables have unit root as the line graphs failed to severally cross the zero-line and with remarkable departures from it.

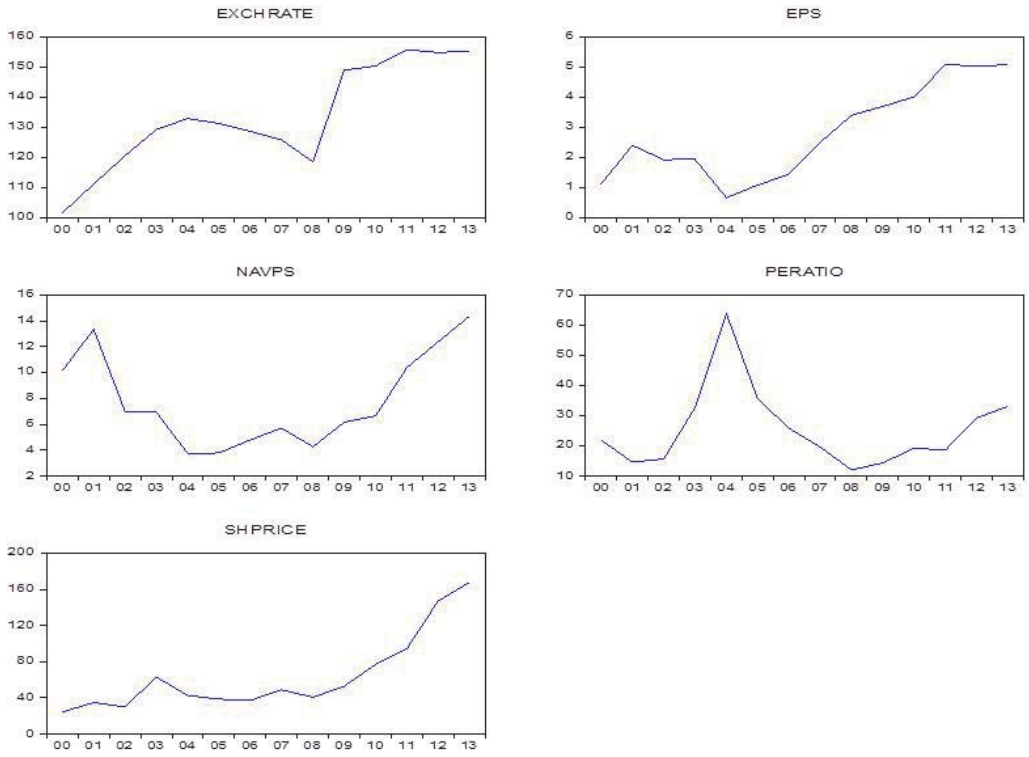

Figure 1: Graphical Representation of the Variables
Source: Author's EView 8.0 Output.

The Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) procedures are therefore applied to determine the order of their integration or stationary status.

Table 2: Augmented Dickey Fuller (ADF) Unit Root Test Results

Variables	Test Critical Values			Test Statistics Status	
	1 %	5 %	10 %	ADF	(Stationary)
Exchange Rate	-4.200056	-3.175352	-2.728985	-5.813105	I(2)
EPS	-4.200056	-3.175352	-2.728985	-6.072740	I(2)
NAVPS	-4.200056	-3.175352	-2.728985	-13.56479	I(2)
P/E Ratio	-2.816740	-1.982344	-1.601144	-3.564196	I(2)
Share Price	-4.200056	-3.175352	-2.728985	-7.153145	I(2)

Source: Researcher's EView 8.0 Computation

Table 3: Phillips-Perron (PP) Unit Root Test Results

Variables	Test Critical Values			Test Statistics Status	
	1 %	5 %	10 %	PP	(Stationary)
Exchange Rate	-4.200056	-3.175352	-2.728985	-8.815085	I(2)
EPS	-4.200056	-3.175352	-2.728985	-6.775169	I(2)
NAVPS	-4.200056	-3.175352	-2.728985	-30.56820	I(2)
P/E Ratio	-2.792154	-1.977738	-1.602074	-8.982625	I(2)
Share Price	-4.200056	-3.175352	-2.728985	-11.35136	I(2)

Source: Researcher's EView 8.0 Computation

Table 4: Kwiatkowski-Phillips-Schmidt-Shin (KPSS)

Variables	Test Critical Values			Test Statistics Status	
	1 %	5 %	10 %	KPSS	(Stationary)
Exchange Rate	0.739000	0.463000	0.347000	0.143081	I(2)
EPS	0.739000	0.463000	0.347000	0.149982	I(2)
NAVPS	0.739000	0.463000	0.347000	0.188096	I(2)
P/E Ratio	0.739000	0.463000	0.347000	0.096114	I(0)
Share Price	0.739000	0.463000	0.347000	0.175456	I(2)

Source: Researcher's EView 8.0 Computation

Tables 2, 3 and 4 above reveal that exchange rate, earnings per share, net asset value per share and share price time series data under the Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) procedure, achieved stationary at second difference. The Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests also confirm that the time series data for price-earnings ratio are also stationary at second difference. When time series data are integrated of the same order, the data tend to cointegrate (Engle and Granger, 1985). They document that when two time series are integrated of the same order and some linear combinations of them are stationary, then the two series are cointegrated.

- Cointegrated series share a stochastic component and a long term equilibrium relationship.
- Deviations from this equilibrium relationship as a result of shocks will be corrected over time.
- We can think of ΔYt as responding to shocks to X over the short and long term.

Therefore the outcome of the unit root tests resulted in the generation of data series, free from unit root as shown in the graphs below:

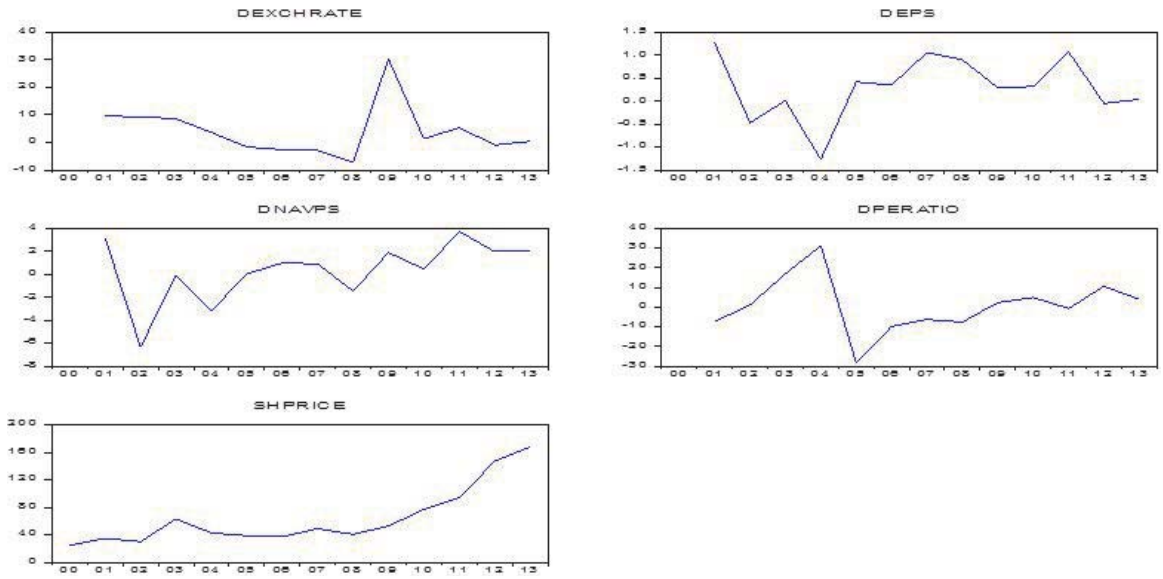

Figure 2: Graphical Representation of the Variables after differencing at 1(2)
Source: Author's EView 8.0 Output.

Table 5: Descriptive Statistics

	EXCHRATE	EPS	NAVPS	PERATIO	SHPRICE
Mean	133.1979	2.812500	7.827143	25.44143	64.36857
Median	130.2450	2.450000	6.780000	20.74000	45.90000
Maximum	155.7000	5.080000	14.36000	63.88000	167.9000
Minimum	101.7000	0.670000	3.740000	12.01000	24.62000
Std. Dev.	17.40515	1.564042	3.622231	13.45721	43.84912
Skewness	-0.100115	0.268622	0.576276	1.700232	1.429995
Kurtosis	1.937015	1.690474	1.951168	5.748259	3.776167
Jarque-Bera	0.682516	1.168703	1.416583	11.15105	5.122821
Probability	0.710875	0.557467	0.492485	0.003789	0.077196
Sum	1864.770	39.37500	109.5800	356.1800	901.1600
Sum Sq. Dev.	3938.209	31.80094	170.5673	2354.254	24995.68
Observations	14	14	14	14	14

Table 5 describes the statistics of the study. It shows the mean values of the data used for the study as well as deviations from the mean. It indicates the maximum and minimum values for the time series data under consideration. The coefficient of skewness for exchange rate, earnings per share and net asset value per share have values far below unity (1) while price-earnings ratio and share prices have skewness above 1. Therefore, a normal frequency distribution is suggested in the case of exchange rate, earnings per share and net asset value per share while that of price-earnings ratio and share price reveal that the frequency is not normally distributed. Kurtosis coefficient is 1.937015, 1.690474 and 1.951168 for exchange rate, earnings per share and net asset value per share respectively while the values are 5.748259 and 3.776167 for price-earnings ratio and share price respectively. Jarque-Bera statistic shows that price-earnings ratio and share price indicate significant p-value of 0.003789 and 0.077196. Both Kurtosis and Jarque-Bera statistic confirm the data series mode of distribution. Exchange rate, price-earnings ratio and share price show volatile standard deviations.

Granger-causality test is conducted in the context of linear regression models and specified in bivariate linear autoregressive model of two variables X_1 and X_2 based on lagged values as applied by Pasquale (2006) and cited in Inyiama(2013)*:*

$$X_1(t) = \sum_{j=1}^{p} A_{11,j}X_1(t-j) + \sum_{j=1}^{p} A_{12,j}X_2(t-j) + E_1(t) \quad \ldots\ldots(5)$$

$$X_2(t) = \sum_{j=1}^{p} A_{21,j}X_1(t-j) + \sum_{j=1}^{p} A_{22,j}X_2(t-j) + E_2(t) \quad \ldots\ldots(6)$$

Where;

p is the maximum number of lagged observations included in the equation, the matrix *A* contains the coefficients of the equation (i.e., the contributions of each lagged observation to the predicted values of $X_1(t)$ and $X_2(t)$,

X_1 is the share price which is constant while X_2 takes the form of various financial performance indicators identified above and,

*E*1 and *E*2 are residuals (prediction errors) for each time series.

Table 6: Pairwise Granger Causality Tests

Date: 05/07/14 Time: 11:30
Sample: 2000 2013
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
EPS does not Granger Cause EXCHRATE	12	3.84675	0.0746
EXCHRATE does not Granger Cause EPS		1.07086	0.3929
NAVPS does not Granger Cause EXCHRATE	12	0.16173	0.8538
EXCHRATE does not Granger Cause NAVPS		12.9132	0.0045
PERATIO does not Granger Cause EXCHRATE	12	1.70785	0.2488
EXCHRATE does not Granger Cause PERATIO		0.05938	0.9428
SHPRICE does not Granger Cause EXCHRATE	12	0.29971	0.7501
EXCHRATE does not Granger Cause SHPRICE		0.89720	0.4499

Source: EView 8.0 Computation

On causalities as shown in Table 6, there is a unidirectional causality running from earnings per share to exchange rate and another unidirectional causality running from exchange rate to net asset value per share. The implication is that earnings per share granger causes exchange rate at 10% level of significance while exchange rate granger causes net asset value at 5% level of significance.

Figure 3 below reveals that the line graph of the fitted observations is very close to the graph of the corresponding observed values.

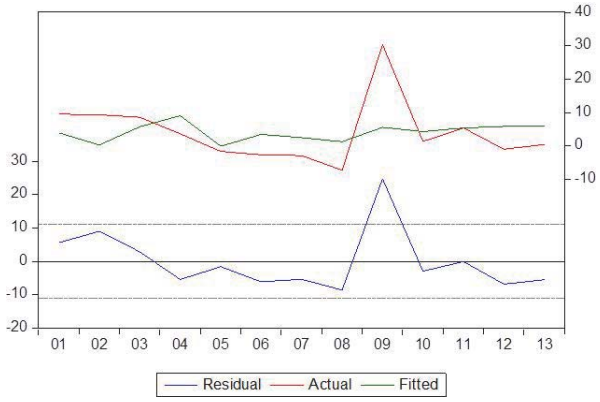

Figure 3: Residual graph of the parsimonious model
Source: EViews 8.0 Output

Table 7: Residual Test for Stationary

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.044697	0.0643
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESIDUAL)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RES(-1)	-1.068904	0.351071	-3.044697	0.0159
C	0.188995	2.095380	0.090196	0.9303

R-squared	0.536774	Mean dependent var	0.285634
Adjusted R-squared	0.478871	S.D. dependent var	9.177835
S.E. of regression	6.625415	Akaike info criterion	6.796559
Sum squared resid	351.1689	Schwarz criterion	6.857076
Log likelihood	-31.98280	Hannan-Quinn criter.	6.730172
F-statistic	9.270181	Durbin-Watson stat	2.035775
Prob(F-statistic)	0.015949		

Source: EView 8.0 Computation

Table 7 reveals that the variables are co-integrated at 10 percent significance level. According to the Granger Representation Theorem, when the variables under study are integrated in the same order and are found to be cointegrated, an error correction model can then be estimated as in equations 1 to 4 above. The output of the regression analysis is presented below.

Table 8: Regression Results

Dependent Variable: D(Exchange Rate)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEPS	-12.40535	8.589190	-1.444298	0.1988
DRESIDUAL(-1)	-0.822102	0.380231	-2.162110	0.0739
C	9.291832	5.352394	1.736014	0.1332

R-squared	0.457758	Mean dependent var	2.478889
Adjusted R-squared	0.277011	S.D. dependent var	11.00142
S.E. of regression	9.354375	Akaike info criterion	7.570767
Sum squared resid	525.0260	Schwarz criterion	7.636508
Log likelihood	-31.06845	Hannan-Quinn criter.	7.428897
F-statistic	2.532585	Durbin-Watson stat	1.719413
Prob(F-statistic)	0.159433		

Source: EView 8.0 Computation

Table 8 reveals that Earnings Per Share has a short term negative and insignificant effects on exchange rate while the long run coefficient show a negative and significant influence at 10 percent level of significance. The error correction mechanism suggests that deviations from equilibrium are corrected at approximately 82% per annum. This implies that the distortions affecting foreign exchange rate in the long run could be corrected in approximately one year and three months (approximately 15 months) if consistent efforts are made to continually improve on earnings per share.

Table 9: Regression Results

Dependent Variable: D(Exchange Rate)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DNAVPS	2.722190	2.409496	1.129776	0.3017
DRESIDUAL(-1)	-0.532618	0.371619	-1.433236	0.2018
C	-0.248617	4.394706	-0.056572	0.9567

R-squared	0.397426	Mean dependent var	2.478889
Adjusted R-squared	0.196568	S.D. dependent var	11.00142
S.E. of regression	9.861057	Akaike info criterion	7.676265
Sum squared resid	583.4427	Schwarz criterion	7.742007
Log likelihood	-31.54319	Hannan-Quinn criter.	7.534395
F-statistic	1.978640	Durbin-Watson stat	1.815787
Prob(F-statistic)	0.218792		

Source: EView 8.0 Computation

Table 9 indicates that foreign exchange rate exerts a positive influence on net asset value per share; though not to a significant extent. The long term coefficient reveals a negative and also insignificant relationship. The error correction mechanism in this case suggests that the deviations from equilibrium and the distortions influencing foreign exchange rate could be corrected in approximately 53% per annum by improving consistently on net asset value per share. This implies that it could take approximately one year and eleven months (approximately 23 months) to readjust to equilibrium and attend to the distortions if net asset value per share is properly managed. The insignificant association places doubt as to the ability of the error correction mechanism to correct the deviations in the long term.

Table 10: Regression Results

Dependent Variable: D(Exchange Rate)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DPERATIO	0.373322	0.305367	1.222536	0.2673
DRESIDUAL(-1)	-0.678493	0.366949	-1.849012	0.1139
C	4.372242	3.436847	1.272167	0.2504

R-squared	0.414969	Mean dependent var	2.478889
Adjusted R-squared	0.219959	S.D. dependent var	11.00142
S.E. of regression	9.716447	Akaike info criterion	7.646719
Sum squared resid	566.4561	Schwarz criterion	7.712460
Log likelihood	-31.41023	Hannan-Quinn criter.	7.504849
F-statistic	2.127937	Durbin-Watson stat	2.040548
Prob(F-statistic)	0.200233		

Source: EView 8.0 Computation

Table 10 reveals that foreign exchange rate is positively but not significantly with price-to-earnings ratio in the short run. However, the long term coefficient shows a negative and insignificant relationship between exchange rate and price-earnings ratio. In this case, the distortions influencing the rate of foreign exchange and the error correction mechanism suggest, through the long term coefficient, that approximately 68% of the distortions, all things being equal, could be corrected in a year. Though the long term association is not significant, it implies that in about 18 months (a year and 6 months), the distortions and deviations from equilibrium could be corrected by the error correction mechanism.

Table 11: Regression Results

Dependent Variable: D(Exchange Rate)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DSHPRICE	0.203404	0.207029	0.982491	0.3638
DRESIDUAL(-1)	-0.740633	0.401065	-1.846663	0.1143
C	0.325548	4.353647	0.074776	0.9428

R-squared	0.370512	Mean dependent var	2.478889
Adjusted R-squared	0.160682	S.D. dependent var	11.00142
S.E. of regression	10.07887	Akaike info criterion	7.719962
Sum squared resid	609.5022	Schwarz criterion	7.785703
Log likelihood	-31.73983	Hannan-Quinn criter.	7.578092
F-statistic	1.765776	Durbin-Watson stat	1.924069
Prob(F-statistic)	0.249438		

Source: EView 8.0 Computation

Table 11 documents that share prices of equity shares are positively and insignificantly related to foreign exchange rate in the short run. The long run coefficient of the relationship between share price and exchange rate reveals a negative and insignificant relationship. It further reveals that about 74% of the deviations and distortions from equilibrium of exchange rate could be readjusted by the error correction mechanism in an accounting year. This implies that the entire deviations could be corrected in about 16 months (a year and 4 months) except for the insignificant long term coefficient which could impair the return to equilibrium.

Table 12: Correlation Results

	DEXCHRATE	DEPS	DNAVPS	DPERATIO	DSHPRICE
DEXCHRATE	1.000000	-0.115278	0.078397	0.225798	0.076343
DEPS	-0.115278	1.000000	0.638259	-0.671177	0.179599
DNAVPS	0.078397	0.638259	1.000000	-0.228923	0.547866
DPERATIO	0.225798	-0.671177	-0.228923	1.000000	0.182207
DSHPRICE	0.076343	0.179599	0.547866	0.182207	1.000000

Source: EView 8.0 Computation Output.

Table 12, reveals a positive correlation between net asset value per share, price-earnings ratio, share price and exchange rate. A negative correlation is found between exchange rate and earnings per share. However, amongst all the variables under study, only price-earnings ratio indicates a significant 23% strength of correlation.

5. Summary and Conclusion

The study aims at determining the extent of association and causalities amongst the variables under study. The researcher applied the 2-step cointegration and error correction model of Engle and Granger (1987) in a simple regression framework. Earnings Per Share has a short term negative and insignificant effect on exchange rate while the long run coefficient show a negative and significant influence at 10 percent level of significance. It was found that foreign exchange rate exerts a positive influence on net asset value per share; though not to a significant extent while the long term coefficient reveals a negative and also insignificant relationship. In the case of price-earnings ratio, it shares a positive but insignificant relationship with foreign exchange rate in the short run while its long term coefficient shows a negative and insignificant relationship. Prices of equity shares are positively and insignificantly related to foreign exchange rate in the short run while in the long run, share price and exchange rate relate negatively and insignificantly too.

On causalities, there is a unidirectional causality running from earnings per share to exchange rate and another unidirectional causality running from exchange rate to net asset value per share. The implication is that earnings per share granger causes exchange rate at 10% level of significance while exchange rate granger causes net asset value per

share at 5% level of significance. The long term coefficient of all the variables are negative and this is in tandem with our earlier (a priori) expectations that in the long run, EPS, NAVPS, P/E Ratio, and Share Price will relate negatively with foreign exchange rate. Earnings prove to have a stronger long run impact on foreign exchange rate. The implication of the negative short run and significant long term relationship between earnings and exchange rate in Nigeria brewery industry is that foreign exchange rate could be maintained at a low rate if there is a consistent growth in corporate earnings. It can also be argued that since they share an inverse relationship, a rise in the foreign exchange rate may adversely affect earnings of firms in Nigeria brewery industry as a result of high demand of foreign exchange in the sector.

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