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THE INTERACTIONS BETWEEN STOCK PRICES AND EXCHANGE RATES IN SOUTH-AFRICA

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Abstract

Financial variables e.g. stock prices and foreign exchange rates are mostly viewed as the significant indicators for financial market in a country. In the globalization and foreign investments structure, financial markets (stock and foreign exchange market) are defenseless against the effects of external and internal factors, making common impacts to be more unpredictable, enhanced and diversified. This study examines the interactions between stock price index and exchange rate of South Africa using monthly data for the period June 2002 to September 2017, both cointegration tests and the Granger causality tests were adopted. The result of finding indicates that cointegration exists between the variables and the Granger causality test results show the existence of bi-directional causal linkage between the JSE All share index and Rand/US exchange rates in the short run. It was recommended that investors should manage/ hedge against risk in the stock prices and foreign exchange in the domestic market. Diversification of portfolios is also recommended to cater for volatility in exchange rates.

Keywords: Financial Markets, Exchange Rates; Stock Prices; Causal Relationship; Cointegration

INTRODUCTION

The interactions between stock prices and exchange rates has continued to generate interest among researchers, economists, practitioners' foreign investors and policy-makers who are concerned about the prices of financial assets due to globalization, new technology, expansion of trade, investment liberalization and financial market integration between countries' financial markets and the flexibility exchange rates. Besides, this development has permitted the financial institutions and investors to diversify their investment portfolios across the countries. Tsai (2012) opined that these two factors assume critical parts in influencing a country's economic growth and development. However, the Sub-Sahara African monetary markets operations are basically dominated by banking sector but recently capital markets are gradually assuming a critical role with the introduction of some financial reforms over the regions in the late 1980s and all through the 1990s (Ndako, 2013).

The development of new capital markets, coupled with the floating of exchange rate systems in emerging economies, and the speedy integration of currency and asset markets globally, had attracted the attention of foreign investors, financial analysts, and policy makers among others to know how exchange rates related to stock prices. Akel (2014) mentioned that the fluctuations of exchange rates had provided information to predict interactions between stock prices for investment, portfolio strategies and speculation.

The oscillation in exchange rates and adoption of flexible exchange rate systems in 1973 by South Africa with the consequence of exchange rate volatility, unwinding of foreign capital controls, the new capital markets emerging and expanding in predominance of countries opting to accept more flexible exchange have all served to recharge enthusiasm for how stock prices and exchange rates are connected (Diamandis & Drakos 2011; Omojimite & Akpokodje 2010; Lin 2012; Lee & Wang, 2015; Tursoy, 2017). However, this relaxation has increased portfolio diversification and international investments opportunities globally. Besides, adoption of fluctuating exchange rate regimes with by countries has pave way for the volatility in foreign exchange markets and the risks associated with international investments. Therefore, the stock market changes have caused the transfer of funds within the countries to affect the value of the exchange rates (Tursoy, 2017).

Akel (2014) defines trade investment liberalization as the elimination of external and local barriers that can put restrictions on huge privatization programmes and to allow the market forces to determine prices rather than a central planning administration. Thus, financial systems were created to encourage movement of private capital and macroeconomic adjustments. Phylaktis & Ravazzolo (2005) pointed out that the rate of exchange rate (currency denomination) is one of the determinant factors for foreign investment portfolio decisions.

However, stock prices and foreign exchange rates are mostly viewed as a significant indicator for financial market in a country and stock markets also reflect the growth status of economies. Though, securities markets can encourage the development of economies to cause economic factors within the country and the international markets to interact with exchange rates to make international investment and the exchange rate regimes to be floating (Tursoy, 2017).

The theoretical perspective of the interactions between exchange rates and stock prices has been established in the literature on a traditional model (flow-oriented model), a portfolio balance model and monetary model. According to the traditionalist model, Dornbusch & Fischer (1980) argued that when there is changes in a country's currency, it will affect the balance of trade and international competitiveness, exports of the domestic manufacturers and real output. These subsequently influence real output and income of the country, and have impact on stock prices. Hence, the depreciation in country's currency makes locally produced goods relatively cheaper to foreign goods and increase exportations. This may enhance stock prices of manufacturing firms in that country. Conversely, an increase in domestic currency will cause prices of stocks to go up and this reduces foreign demand for securities. Thus, this pattern of relationships may prompt a fall in value and stock prices. The traditionalists therefore suggest that exchange rates make the stock prices to change. While the portfolio balance model (Branson, 1983; Frankel, 1983) viewed that the changes in the stock market price lead to change in exchange rates due to fundamentals increases in the wealth (shares), and this stimulates demand for currency. This model agreed that exchange rates are determined by the forces of market mechanism as it affects other commodities. Hence, it is assumed stock prices changes by implication leads to changes in exchange rates and that both are negatively related. Lastly, the Monetary Model by (Gavin, 1989) postulates that the main factors determining the interactions between exchange rates and stock prices are usually driven by different factors. Though, the developments in capital market may influence exchange rates through demand for money as indicated by monetarist models of exchange rate determination. Therefore, Gavin (1989) presumed that there is no linkage between exchange rates and stock prices apart from the fact that both variables are affected by some common factors. Thus, this model does not have theoretical consensus on interactions between the variables (Bahmani-Oskooee & Sohrabian, 1992; Liang, Chen & Yang, 2015). The obvious lack of agreement among these three models and different hypothetical outcomes about the interaction and causality between foreign exchange rates and stock markets prices is a critical research gap. More so, these variables play important roles in country's economic development and an inquiry into such interactions taking into considerations the increased exchange rate volatility and its effect on emerging market like South Africa is a right step in the right direction.

LITERATURE REVIEW

Stock Markets in South Africa

The establishment of Johannesburg's Stock Exchange (JSE) goes back to the period of discovery of gold in 1886 at Witwatersrand that facilitate the formation of mining and financial companies to provide a medium required for central facilities to have access to fund. With the economic boom, rapid growth in mining industry in the 1890s and the injection of about 200 million pounds into gold business of which a large proportion from foreign investors positioned the JSE as the oldest Stock Exchange in sub-Sahara Africa (Bryant, 1987; Gilmour, 2006). Smit, Mostert and Osthuizen (2007) recorded that the Johannesburg Stock Exchange control Act of 1947 was passed to control and regulate its operations with capital requirements for members and the conduct of the brokers. The JSE was a member World Federation of Exchanges and commenced automated trading system to replace open outcry trading floor in 1963 and 1966 respectively.

In 2003, the JSE launched an alternative exchange (AltX) for small and mid-sized listings and the Yield X for interest rate and currency instruments. In 2001 and 2009, the JSE acquired both the South African Futures Exchange (SAFEX) and Bond Exchange of South Africa (BESA) respectively. Johannesburg Stock Exchange was classified into five offered financial markets (Financial, Equities, Commodity, Bonds, and Interest Rate Derivatives with about 400 listed companies). More so, British American Tobacco (BAT), SABMiller, Glencore Xstrata and BHP Billiton accounted for a large share of the financial markets (JSE, 2017). The JSE activities offer secure, efficient both in primary and secondary capital markets over a various scope of instruments with cost-effective services. JSE market capitalization was $828 billion, about $900 billion and $987 billion in 2007, 2012 and March, 2017 respectively, and this positioned JSE as one of the biggest stock markets in the world (JSE Market Profile, 2017).

Related Literature

Based on the theoretical models that suggest causal relations between stock prices and exchange rates, several notably researches has been carried out to empirically investigate the interactions between these two variables - stock prices and exchange rates. However, consensus on the course of effect and causality between these two financial markets variables remains unresolved. The inconsistent or contradictory results in this field vary from one study to another. For example, Ajayi, Friedman & Mehdian (1998) employed Granger-Sim causality to examine the relationship between exchange rates and stock price indexes among developing and developed economies. Their study revealed a consistency in the relationships between exchange rates and stock prices among developed economies tailoring to the views of portfolio

model. The empirical study by Bahmani-Oskooee & Sohrabian (1992) suggested a short run bi-directional causal relationships for both stock prices and exchange rates in US stock market. While Richards & Simpson (2009), investigated the relationship between stock prices and exchange rates in Australia for the period of 2003 to 2006 and found a strong positive relationship between these two variables.

Tursoy (2017) examined the interaction between stock prices and real exchange rates in Turkey between 2001 and 2016 using the ARDL and ECM models. His study revealed a long-run relationships and co-movement causality between the two variables. Additionally, a causality linkage from the real exchange rates to the stock prices only in the short-run was discovered. Phylaktis & Ravazzolo (2005) investigated relationship between exchange rate and stock prices in Singapore, Malaysia, Philippines, Thailand, and Hong Kong. Their results suggest that stock markets have positive relation with foreign exchange markets. In addition, the U.S stock market acts as a channel for these links; and the financial crises had a temporary effect on the long-run co-movement of these markets. The Pooled Mean Group methods was used by Lee & Wang (2015) to estimate the association between stock prices and exchange rates in 29 countries for period of 2000 – 2011. The study revealed a long-run positive relationship between the financial and exchange markets supporting the results of the traditional approach.

Lee et al. (2011) evaluated the dynamic linkage between stock prices and exchange rates in six emerging Asian countries. The result indicated a significant price spillovers and linkage from stock market to foreign exchange market in Taiwan, Thailand, Malaysia, Korea and Indonesia except in Philippines where the stock market volatility was high. In China, the study of Rutledge et al. (2014) found a long-run relationship between exchange rates and the Shanghai All share prices. However, for nine of ten industry indices, causation only existed during the volatile period of managed exchange rates before the global financial crisis.

Yang et al. (2014) applied Granger causality (Quantiles) tests to examine causal relations between stock returns and exchange rate changes in nine Asian markets over the period 1997 - 2010. The results of quantile causal relations vary across different quantiles and periods observed. The linkage effects between exchange rate changes and stock returns are unrelated across quantiles, although, most of the stock and exchange markets are negatively correlated. The study on Korea during the Asian financial crisis by Fang and Miller (2002) revealed that the stock market performance was seriously affected with depreciation in the value currency. Zhao (2010) examined the dynamic relationship between real effective exchange rates and stock prices with VAR and multivariate generalized autoregressive (GARCH) models for 1991 - 2009. The results showed that the relationship between stock price and real exchange rate has no

stable long-term equilibrium. Similarly, Akel (2014) investigates relationship between exchange rates and stock prices in nine transition economies from 1995 to 2011 and determined the causal linkage among the variables with linear and nonlinear causality test. The result indicated that Latvia, Lithuania, Estonia and Bulgaria have no causal linkage with linear Granger causality test. While, the non-linear Granger causality test reported no causality in either direction of exchange rate and stock price for all countries under study except Russia.

Study for Canada, Australia, Japan, United Kingdom and Switzerland by Alagidede et al. (2011) investigates the linkage between stock markets and foreign exchange markets (1992-2005). Their findings indicated that no long run relationship exist between the variables. However, the three variation of Granger causality test displayed causality from exchange rates to stock prices in Canada, Switzerland and UK but Switzerland experienced a weak linkage direction. The non-linear causality (Hiemstra–Jones test) indicates that causality runs from stock prices to exchange rates in Japan, while, causality from exchange rates to stock prices in Switzerland is weak. Bhattacharya & Mukherjee (2003) study the relationship among real effective exchange rates, stock prices, foreign exchange reserves and the value of trade balance and find no link relation between stock price and other variables. This result agrees with that of Mishra (2004) who found no causality relationship in either direction between stock market returns and exchange rates in India. Similarly, Karacaer & Kapusuzoglu (2010) study the relationship between exchange rates and stock returns in Turkey and found no Granger cause stock returns and exchange rates.

Granger et al. (2000) study of nine Asian countries found a co-movement causality in five countries (Malaysia, Hong Kong, Singapore, Taiwan and Thailand) and find no causal in Japan and Indonesia. On contrary, Nieh & Yau (2010) find only short-run causation from exchange rates to the Shanghai All share index returns and they demonstrated a relationship between the two variables with Asymmetric Threshold Cointegration (ECM Analysis).

In Africa, Fowowe (2015) studies interactions between stock prices and exchange rates in South Africa and Nigeria. The study reveals no linkage between stock prices and exchange rates in South Africa but it exists in Nigeria. The result also found causality runs from exchange rates to domestic stock prices in Nigeria and no evidence of such in South Africa using multivariate causality tests. Ndako (2013) examines the nexus relationship between stock prices and exchange rates in Mauritius, Ghana, Kenya, Nigeria and South Africa. He discovered that causality only runs from stock prices to real exchange rates in Ghana and Mauritius, while for Nigeria; it is from real exchange rates to stock prices. For Kenya and South Africa, there is no causality between stock prices and real exchange rates. The results for dynamic conditional

correlation models show that Ghana is the only country that exhibits a positive correlation between stock prices and real exchange rate.

Raji et al. (2017) used a Quantile regression approach to examine the stock price index and exchange rate nexus for six African markets (Mauritius, Namibia, Nigeria, South Africa, Zambia and Kenya). Results discovered that the relationship are higher in returns of stock price index (in absolute terms) and the coefficients estimated are more significantly negative at higher points of the exchange rate distribution, except for Namibia. In Namibia, the return of stock price index (in absolute terms) is higher at lower points of the exchange rate distribution (below the 0.07 quantile) and the coefficients estimated are significantly negative. The negative relationship was more pronounced when exchange rates are extremely low or high. The study of Mlambo et al. (2013) assesses the effects of currency volatility on All Share index in South African for the period 2000 – 2010. They employed the Generalised Autoregressive Conditional Heteroskedascity (1.1) (GARCH) model to examine the exchange rate volatility and stock market performance. The study found a very weak relationship between exchange rate volatility and the stock market and, since then the negative effects of currency volatility has been exposed. In empirical studied by Alam et al. (2011) seeks an evidence to support the existence of exchange rate sensitivity and market efficiency on stock prices in the Johannesburg Stock Exchange. Their findings show a long run bi-directional relationship between exchange rate and stock prices as well as long run equilibrium.

Summarily, obvious mixed results were observed from the literature reviewed on the relationship between stock prices and exchange rates for advanced countries, Asian and African countries (Richard & Simpson, 2009; Zhao, 2010; Lee et al., 2011; Yang et al., 2014; Lee & 2015; Tursoy, 2017). Specifically, few studies existed in Africa on such relationship. For South Africa, Alam et al. (2011) reported no causality between stock price and exchange rate, while Mlambo et al. (2013) provides a very week relationship. This lack of consensus in the literature compels this study on the interactions between the two variables in South Africa for the fact that Johannesburg Stock Exchange is the largest and most developed exchange in the Sub Sahara Africa with the largest number of listed companies. In addition, it is one of the best-performing African stock markets (ABC, 2015).

METHODOLOGY

This paper used monthly data for JSE stock market index and exchange rate in South Africa for the period June 2002 - September 2017. The choice of the period is premised on data availability in JSE All-Share Index. Secondly, the global financial crisis in financial markets that was experienced by South African financial markets falls within the period of study. Data relating

to All-Share Index were obtained from JSE while exchange rates data were collected from the International Financial Statistics (IFS). However, this study is an empirical analysis between exchange rates and stock price in South Africa and from the literature (Huang and Yang, 2000; Ndako, 2013; Rutledge et al. 2014; Fowowe, 2015), we employed a three steps procedure to estimate the interactions between stock price and exchange rate. First, unit root test was applied to determine the stationarity of the variables (stock prices and exchange rates). In determining the stationarity of the series we conduct a unit root test. The nonexistence of a unit root in the series indicate there is same order of integration. Secondly, the determination as to whether the variables are cointegrated with each other was tested using Johansen Cointegration test and lastly, Granger causality test between the stock prices and exchange rate was done to determine the direction of the relationship. Specifically, the two conventional unit root tests - Augmented Dickey-Fuller test (ADF) (1981) and Phillips & Perron (PP) test (1988) was used to achieve this objective.

The combination of *n*-variables and *n*-equations in VAR, and every variable are explained by lag values and the remaining *n*–1 variables. In using Johanson and Juselius test, a VAR model with *g* variables was established as:

$x_t = A_1 x_{t-1} + \varepsilon_t$ ---------- (i)

$x_t = (A_1 - I) x_{t-1} + \varepsilon_t$ ---------- (ii)

$x_t = \pi x_{t-1} + \varepsilon_t$ ---------- (iii)

Where,

$\pi = (A_1 - I)$, x_t and ε_t are g × 1 vectors, A_1 is a g × g matrix of parameters, and I is a g × g identity matrix, respectively.

In this study, the VAR model has the following form:

$SP_t = \alpha_0 + \alpha_{1i} SP_{t-I} + \alpha_{2j} EX_{t-j} + \varepsilon_t$ ---------- (iv*)*

Where,

SP_t = stock price; and EX_t = exchange rate.

Granger causality test was used to determine if changes in exchange rate has any interaction with Johannesburg's stock prices. In doing this, given two-time series variables - exchange rates (EX) and stock prices (SP), EX is defined to Granger cause SP if EX improves the prediction of

SP (using EX and its lags together with SP and its lags), as compared to only using SP and its lags. For this study, the Granger causality test is specified as:

$SP_t = \alpha_0 + \alpha_{1i} SP_{t-I} + \alpha_{2j} EX_{t-j} + \varepsilon_t$ ---------- (v)

$EX_t = \alpha_0 + \alpha_{1i} EX_{t-1} + \alpha_{2j} SP_{t-j} + \varepsilon_t$ ---------- (vi)

Where, SP_t = stock price index, EX_t = exchange rate and ε_t = Error term

Granger (1987) demonstrates that if variables are cointegrated in time series, definitely it is Granger causality. The causality can be directional or cross linkage with each other. However, this does not mean that the absence of cointegration infers that causality is missing. MacDonald and Kearney (1987) pointed out that when variables are identified as cointegrated; the causal relationship should be modeled with VECM; otherwise, it should be standard Granger VAR model.

In line with this background, this study specified VECM for cointegrated variables of stock prices and exchange rate as follows:

$SP_t = \alpha_0 + \alpha_{1i} SP_{t-1} + \alpha_{2j} EX_{t-j} + \theta_1 v_{t-1} + \varepsilon_t$ ---------- (vii)

$EX_t = \alpha_0 + \alpha_{1i} EX_{t-1} + \alpha_{2j} SP_{t-j} + \theta_2 v_{t-1} + \varepsilon_t$ ---------- (viii)

Where,

v_t is the cointegrating vector, θ_1 and θ_2 are the adjustment coefficients and ε_t = Error term

RESULTS AND DISCUSSION

Statistical Results

Figures 1 and 2 show graphically JSE All shares index and Exchange rate for South Africa respectfully. Figure 1 demonstrates how the JSE stock index had an upward movement from 2003 to March 2008 and the JSE stock index experienced a sharp fall between April, 2008 and June, 2009 but thereafter, the trend was a continues upward movement. These sharp falls in JSE stock market may be as a result of the financial global crisis in the financial markets experienced in the developed economies but took sometime before its spilt-over effect got to developing economies. Figure 2 described the trend of exchange rates for South Africa that has experienced considerable volatility.

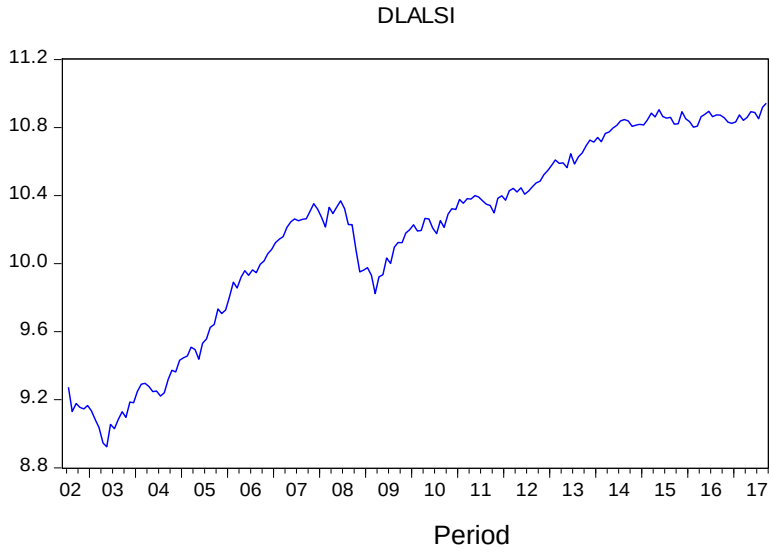

Figure 1: All-Share Index in JSE

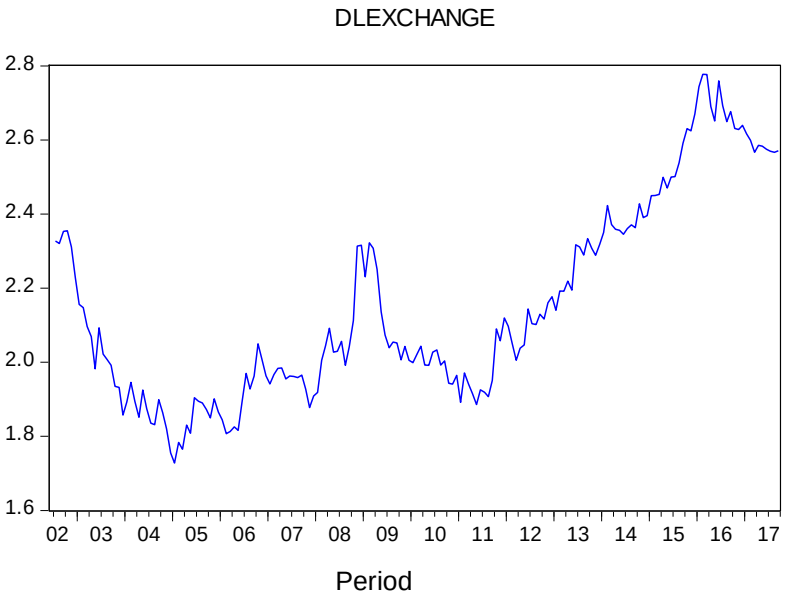

Figure 2: Exchange rate of rand to the dollar.

Unit Roots Test Results

The result of the unit root tests conducted using conventional methods of ADF and PP (table 1) reveals that all the variables has a unit root at level but became stationary after being converted to first difference.

Table 1: ADF and PP Unit Root Tests

Variable		ADF	PP
JSE All Share Index	Level	-0.132	-0.086
	Diff	-15.206***	-15.131***
Exchange	Level	-0.519	-0.513
	Diff	-13.663***	-13.662***

Notes: 1. *** denote significance at the 5% level 2. JSE = All Share Index of the Johannesburg Stock Exchange. Exchange = Exchange rate of the South African

This result satisfied the pre-condition to be met before proceeding to cointegration test in conformity with (Engle and Granger, 1987; Rutledge, Karim, & Li, 2014).

Determination of Optimal Lags

Before testing for cointegration, it is necessary to select appropriate optimal lags for VAR model and can be determined using the VAR order lag selection criteria in Eviews Software. As shown

in Table 2, Lag two (2) was chosen as lag length for the model in Johannesburg's All-share index and exchange rate as specified in lags criteria (Engle and Granger, 1987).

Table 2: Sample results for the optimal lag length for
JSE All Share Index and Rand/USD Exchange Rate

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2281.138	NA	4.74e+08	25.65324	25.68899	25.66774
1	-1612.554	1314.632	271102.9	18.18600	18.29325*	18.22949
2	-1605.574	13.56815*	262181.4*	18.15252*	18.33127	18.22501*
3	-1602.020	6.828434	263512.2	18.15753	18.40778	18.25901
4	-1599.330	5.108764	267442.8	18.17224	18.49400	18.30272
5	-1597.662	3.128679	274584.1	18.19845	18.59171	18.35793
6	-1596.885	1.440130	284769.2	18.23467	18.69942	18.42314

* indicates lag order selected by the criterion LR, FPE, AIC, SC, HQ (each test at 5% level).

Johansen and Juselius Cointegration Tests

In this study, Johansen and Juselius cointegration tests (table 3) was used to ascertain the existence or otherwise of cointegration between the JSE Stock prices and Exchange rate at trace test and maximum eigenvalue statistics.

Table 3: Johannsen and Juselius Cointegration Tests

Hypotheses	Eigen Value	λtrace critical value	5%	Prob.**	λmax critical value	5%	Prob.**
None*	0.157	38.07	20.26	0.0001	27.35	15.89	0.0001
At most 1	0.037	6.944	9.164	0.1294	5.540	9.164	0.1294

Both Trace and Max-eigenvalue tests indicate 1 cointegrating eqn(s) at the 0.005 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values.

Evidence form table 3 reveals the existence of cointegration between the variables. First at no cointegration, the trace value (trace statistic of 38.071 >Critical value of 20.261; *p* <0.0001) shows that Null hypothesis of no cointegration will be rejected while alternative hypothesis that displayed presence of cointegration should be accepted. However, the second hypothesis that at most shown there is one cointegration (trace statistic of 6.944 < critical value of 9.164; p-

value 0.1294). As a result of the p-value greater than 0.05 level, we failed to reject the null hypothesis which means that there at most one cointegration. This is in contrary to the study of Fowowe (2015); Ndako (2013), who found no cointegration between stock market and exchange rate in South Africa.

Further, The VECM only shows the long-run relationship between the variables and also reveal the speed of adjustment of the variable to equilibrium in the presence of shock (See Table 4).

Table 4: Least Squares (Gauss-Newton / Marquardt steps for VECM

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.002450	0.010648	0.230094	0.8183
C(2)	-0.138181	0.080578	-1.714882	0.0881
C(3)	0.041496	0.080325	0.516602	0.6061
C(4)	-366.6683	217.0398	-1.689406	0.0929
C(5)	431.6952	218.0047	1.980210	0.0492
C(6)	278.7487	97.19226	2.868013	0.0046

The result in table which reveals a positive coefficient of cointegration (0.00245) and a p-value of (0.8183) which not statistically significant indicate that there is no long run relationship between JSE Stock prices and Exchange rate. This finding is in contrast with the study of Alam et al. (2011), who found long-run relationship between stock price and exchange rate.

In the absence of the long-run relationship as revealed by this result, there exist the possibility of short-run causality between the variables. In that case, Wald test was conducted to ascertain the significance of the short-run causality.

Table 5: Wald Test: Null Hypothesis: C(4)=C(5)=0 (Equation)

Test Statistic	Value	df	Probability
F-statistic	3.723806	(2, 175)	0.0261
Chi-square	7.447613	2	0.0241

The result of Wald test in table 5 shows F-statistic value of 3.7238 (df, 2,175) with a p-value of 0.0261 indicating the existence of a short run causality running from exchange rate to JSE stock price index. This corroborated the study of Fowowe (2017).

VEC Granger Causality/Block Exogeneity Wald Tests

This study examines the interactions between stock prices and exchange rates and to achieve this VEC Granger causality/Block Exogeneity Wald tests was conducted. Evidence from table this result as provided in table 6 shows that there is a short-run causality running from JSE stock price index to exchange rate which is significant at 5% level.

Further finding also produced a short-run causality running from exchange rate to JSE stock price (*t* = 7.3635, *p-value* = 0.0252; *t* =7.5931, *p-value* = 0.0224, for ALSI and EXCHANGE respectfully).

Table 6: VEC Granger Causality/Block Exogeneity Wald Tests

Dependent variable: D(ALSI)			Dependent variable: D(EXCHANGE)		
Excluded	Chi-sq	df	Excluded	Chi-sq	df
Prob.			Prob.		
D(EXCHANGE)	7.3635	2	D(ALSI)	7.5931	2
0.0252			0.0224		
All	7.3635	2	All	7.5931	2
0.0252			0.0224		

Notes: 1. *** denotes significance at the 1% level

The import of this result is to infer a short run causality and bi-directional causal relationship between the stock prices and exchange rates in South Africa in line with work of Bahmani-Oskooee & Sohrabian (1992) and Tursoy (2017). However, this finding in contrary to the conclusion reached in Fowowe (2015) and Ndako (2013). These results are in agreement with the traditionalist model propounded by Dornbusch & Fischer (1980) who argued that when there is changes in a country's currency, it will affect the balance of trade and international competitiveness, exports of the domestic manufacturers and real output.

CONCLUSIONS AND POLICY IMPLICATIONS

This study examined the interactions between stock prices and exchange rates in South Africa with monthly data over the periods of June 2002 to September 2017. From the findings of this study, it was established that causality exists between stock prices and exchange rates in the short run as confirmed in the Wald Test supporting the viewpoints of the traditional approach. Secondly, the results of VEC Granger Causality/Block Exogeneity Wald Tests showed that there is bi-directional causality running between the two variables (JSE stock prices index and exchange rates in South Africa.

The policy implication cum recommendation from these findings is that investors and policy makers need strategies for hedging and diversification of their investment portfolios. Therefore, investors should manage/ hedge against risk in the stock prices and foreign exchange in the domestic market especially when the stock is stable. In case of volatility, investors should diversify their portfolios to another economy abroad for hedging against risk. Moreover, robust exchange rate policies should be put in place to attract foreign portfolio investment and strategy formulations (such as manipulation of interest rates, environment and economic factors) toward stabilization of stock market fluctuations by policy makers.

Further research study should include more countries especially from Africa and macroeconomic factors with stock price, and this inclusion will investigate the overall effect among the variables to further understand this relationship to make practical policy implication for the continent as a whole.

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