Relationship between Exchange Rates and Stock Market Index: Evidence from the Pakistani Stock Market

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Abstract
This study is aimed to investigate the causal relationship between exchange rates and Karachi Stock Exchange (KSE) 100 Index. The Jarque-Bera test was used to check normality of both the variables. The results indicated that data series of variables do not follow the normal distribution which further required checking the stationarity of variables for which the ADF test was used. The results suggested that at level variables are non-stationary but are stationary at first difference. Accordingly, Johansen Test of Cointegration was used to test long-term relationship between the variables which indicated absence of such relationship. Finally, Granger Causality Test was applied to check the causal relationship between the variables which showed that exchange rates do not Granger cause KSE 100 Index and vice versa.
Keywords: exchange rates, KSE 100 Index, stationarity, Johansen Test of Conitegration, Granger Causality test.

The stock market performance is one of important factors affecting the economic development of a country and may have implications for other macroeconomic variables to achieve the desired results. Such performance is affected by the macroeconomic variables including inflation rate, interest rate and exchange rate (Tripathi, & Seth, 2014). The exchange rates improve the underlying performance of the stock market (Abraham, 2011). The relationship between exchange rates and stock markets is an important area for researchers and is mostly debated being its due role to provide inputs to regulators in reforms of the stock market development.

The causal relationship between exchange rates and stock markets may have significance for economic managers in the formulation of conducive polices. The turmoil in stock markets can be prevented by keeping a check on the exchange rates. On the other hand, if stock prices affect the exchange rates then measures may be exercised to normalize the stock markets.

The existing literature is mixed with regard to the relationship between exchange rates and stock market with documented evidence of positive and negative relationship. Some studies have identified no relationship between these variables such as the one conducted by Zubair (2013) who identified no causal relationship between exchange rate and stock market index before and during the global financial crises for the Nigerian stock market. The advocates of positive causation from stock markets to exchange rates argue that markets with better returns may result in selling of foreign currency in pursuit of high returns thus positively affecting the exchange rates in favor of the domestic currency. On the other hand, the proponents of negative causation from exchange rates to stock market are of the view that depreciation of local currency makes the exports competitive and stock market reflects the same in the form high stock prices. There is also another view which asserts weak or no relationship between exchange rates and stock markets as factors affecting both the variables may not be the same.

Pakistan's economy is one of the important regional economies. However, uncertainty in the face of war like situations and political instability has poorly affected the economic health of the country. But there is no denying the fact the economy in question has enormous potential to attain high levels of efficiency by means of corresponding development in different respective sectors. The outcomes may also be noted on the currency which has depreciated by a wide margin in the recent years with simultaneous effects on macroeconomic variables used to measure the economic performance and stock market index is certainly one of them.

The present government with heavy public mandate has devoted efforts to economic reforms and in this regard steps have been taken to support the declining currency against the dollar and support measures favorable to stock market development. Notwithstanding the pros and cons of the government zeal, to some extent the currency has appreciated but the big challenge is that whether a desired level of currency parity will be maintained in the wake of challenges facing the economy? And more importantly, the associated effects may be seen on the stock market index, a prominent indicator which most of investors perceive to be used as yardstick to invest their savings. This study is conducted with the same purpose to explore the relationship between exchange rates and stock market performance as measured by the Karachi Stock Exchange (KSE) 100 index. The empirical relationship of these two variables may provide a knowledge base for concerned government bodies and stock market investors to make informed decisions which enhance the significance of this study.

Karachi Stock Exchange (KSE) 100 Index

The Karachi Stock Exchange was established on 18 September, 1947 and is among the biggest regional stock exchanges in terms of market capitalization. Initially five companies were listed and KSE 50 index was introduced which was based on 50 companies. With the passage of time more companies were listed on KSE. The trading activities also grew in volume. Therefore, to better represent the stock market, KSE 50 Index was converted into KSE 100 Index and base value of the index was taken 1000 as of November, 1991. The KSE 100 Index is the large stock market index representing the sector wise performance of largest companies of the country listed on the exchange and acts as benchmark to compare stock prices. The Index consists of 100 companies which are selected from each sector on the basis of highest market capitalization. The same also represents over 90 percent of total market capitalization of listed companies. The Index was converted as free float index on 15th October, 2012. In 2002, the KSE was declared as the world's best performing stock market. As on 6th March, 2015, 580 companies are listed on KSE with total market capitalization of Rs.7,625.837 billion.

Objectives

Objectives of the study are as follows:-

- To investigate the effects of exchange rate volatility and stock market volatility on each other.
- To evaluate the role of exchange rates in affecting the stock market and vice versa which may aid economic managers to manipulate the underlying variables to achieve macroeconomic objectives.
- To contribute to the existing body of knowledge to provide decision bases to the stakeholders.

Literature Review

The available literature documents the traditional approach which holds that exchange rates affect the firm's performance in terms of foreign exchange transactions which in turn affects the stock market performance. Seong (2013) based on a Malaysian study documented a significant short term and long term negative relationship between exchange rates and stock market with associated effects on the stock prices. The same view was also supported by Qayyum & Kemal (2006) who asserted a connection between the stock markets and foreign exchange markets as returns in one market affects the returns in other. Moreover, strong effect of foreign exchange market was noted on the stock market returns.

Agrawal, Srivastav & Srivastava (2010) investigated the relationship between Indian stock market returns and exchange rates. They used the Granger Causality test and found unidirectional relationship between the two variables stemming from the former to the later. The vice versa relationship was found between the same variables by Muktadir-al-Mukit (2012) for the Bangladesh stock market. Tsia (2012) noted a negative relationship between stock markets and foreign exchange markets which was more profound in case of extremely high or low exchange rates. The same results were also documented in another study by Dar, Shah, Bhanja & Samantaraya (2014) with strong relation found between the respective variables under the extremely high exchange rates. Kutty (2010) found the short-run relationship between stock prices and exchange rates, however, no long-run relationship was observed between the variables. The Granger causality test was used in the study to determine the causality of variables.

Umoru & O. Asekome (2013) found positive co-integration between exchange rate and stock prices as based on a research carried out on Nigerian Stock market. They also used the Granger Causality test which indicated bi-directional relationship between the variables.

No causal relationship was found between exchange rates and stock prices by Rehman & Uddin (2008) for Bangladesh stock market. The same view is also endorsed by Rehman & Uddin (2009) in another study conducted on Bangladeshi, Indian and Pakistani stock markets. Singh (2010) also found no causality between exchange rate and Indian Stock Market movement.

Moreover, a very weak relationship was noted by Mlambo, Maredza & Sibanda (2013) between the exchange rate volatility and stock market in case of South African Stock Market. Therefore, they were also of the view that such stock market may be regarded a safe area for foreign investment.

Adjasi, Agyapong & K. Harvey (2008) also found that exchange rate volatility is negatively related to the stock market volatility which was measured thorough movements in the stock returns. It was also identified that in long run currency depreciation results in stock market returns whereas in short run a decrease in returns was noted. The unidirectional long-term effect of exchange rates on Istanbul Stock Exchange (ISE) Index was noted by Acikalin, Aktas & Unal (2008) in a study undertaken on the Turkish Stock Market. The said effect was measured through the co-integration test with empirical results that past changes in exchange rate negatively affects the current movements in ISE Index.

Dimitrova (2005) identified the positive effect of stock prices on exchange rates, however, negative relation was noted when former was taken as lead variable. Hamrita (2011) documented a long-term bidirectional causal relationship between exchange rate and stock index for US Stock markets. Rjoub (2012) identified bidirectional relationship between exchange rate and stock prices for Turkish stock markets. In another study based on Indian Stock market, Bhunia (2012) found bidirectional relationship between exchange rate and stock market indices. The same relationship was also noted by Malarvizhi & Jaya (2012) in case of Indian Stock Market. Bokhari (2013) conducted a study on SAARC countries and found that in case of Pakistan and Sri Lanka causality flows from stock market to foreign exchange market. However, vice versa relationship was observed for Indian stock market. Moreover, bidirectional relationship was noted in case of Bangladesh and Nepal.

Data & Methodology

Data

The data for the study was secondary. The daily data from September, 2012 to May, 2014 was used to study the relationship between exchange rates and KSE 100 Index. The data frequency was kept at daily level to better analyze the concerned relationship and to deduce better results pertaining to variables of the study.

The exchange rate taken indicates the nominal exchange rate between Pakistani Rupee (Rs.) to one unit of foreign which is US Dollar ($). The data was analyzed through the Eviews software (version 6.0).

Hypotheses

Considering the available literature and in line with objectives of the study, the following broad hypotheses are formulated to study the relationship between exchange rates and KSE 100 Index:-

Hypothesis 1: Exchange rates and KSE 100 Index does not follow the normal distribution.
Hypothesis 2: The Unit Root or non-stationary exists in both data series at level and vice versa at first difference.
Hypothesis: There is no long-term relationship between the exchange rates and KSE 100 Index.
Hypothesis 4: There is no causality between exchange rates and KSE 100 Index.

Normality Test

The Jarque-Bera test (Gujrati, 2004) is used to check the normality of data. In this regard, it is tested that whether exchange rates and KSE 100 Index individually follow the normal distribution. The Jarque-Bera test is an asymptotic or large sample test and involves calculation of skewness and kurtosis. The normal distribution has skewness = 0 and kurtosis = 3.

Unit Root Test

A unit root test is used to check the stationarity of a time series variable by using the autoregressive model. Granger & Newbold (1974) identified that use of non-stationary data time series in regression analysis may lead to spurious regression. Therefore, stationaity test should be conducted which is most commonly done using the Unit Root Test. And accordingly, we could run regression on the data without spurious results. For stationary data series, the mean and variance remain constant or unchanged over a span of time and covariance value between the two time periods depends on distance or lag between the time periods and not on actual time at which the covariance is calculated (Gujrati, 2004). In the first step, mean of the series is graphically checked to visualize that it shows change over a period of time or otherwise? In the second step, the Augmented Dicky

Fuller (ADF) test is applied to test the stationarity by calculating the respective statistics and p-values. The ADF test is one of the cited Unit Root tests in the existing literature which is principally used.

Johansent Test of Cointegration

Johansen (1988) Test of Cointegration is used to check the co-movement of two data series over a period of time. The cointegration between the series indicates the long-term relationship between the associated variables. This test checks the availability of cointegrating vectors in non-stationary data time series as vector autoregressive (VAR). The number of lags to be included in the test is decided using the lag selection criteria which will be explained in the results section below. The justification for using the cointegration test is that while a number of developments can cause permanent changes in an individual variable, there is a long-run relation at equilibrium which ties together the individual variables as reflected through their linear combination. If the cointegration aspect during the data analysis is ignored in time series data of variables then it may result in spurious regression which happens if intentionally non-stationary time series of variable “Y” is regressed on variable “X” and vice versa.

Granger Causality Test

Once it is determined that there is no cointegrating relationship between the variables, the Granger Causality Test may be applied with the purpose that upto what extent the past values of a variable “X” can explain variable “X” and vice versa. Alternatively, it determines that a time series may be useful to forecast another (Granger, 1969). A time series data of a variable “X” is said to Granger cause the variable “Y” if it is determined using a series F-tests on lagged values of Xt (and also with known lagged values of Yt) that those Xt values provide statistically significant information regarding the future values of Yt time series. Before using the Granger causality test, it is important to determine the stationarity in the pair of variables. If the variables are not coitegrated then Granger causality test can be applied at first difference of both the variables.

Data Analysis and Results

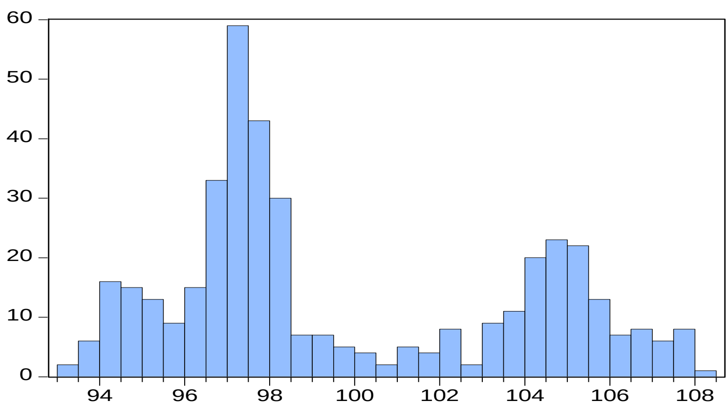
In the first step normality test was used to determine the normality of distribution. In this context, Jarque-Bera statistics was calculated along with corresponding p-value and descriptive statistics. The Table-1 shows that both variables are not normally distributed as skewness value for exchange rates and KSE 100 index are 0.490388 and 0.102054 respectively whereas kurtosis values are 1.839426 and1.764209 respectively. The individual Graphs-1and 2 of both variables also highlight this fact which do not correspond to normal distribution.

Table 1

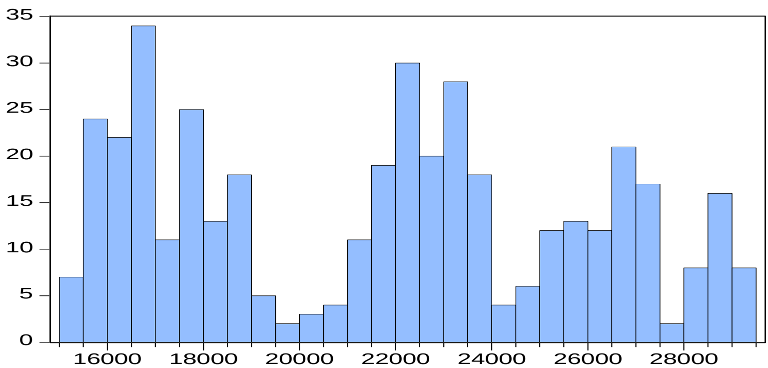
Descriptive Statistics

		Exchange Rates	KSE 100 Index
1	Observations	413	413
2	Mean	99.74120	21660.90
3	Median	97.96000	22160.85
4	Maximum	108.3180	29458.15
5	Minimum	93.16800	15357.59
6	Standard Deviation	4.041426	4175.941
7	Skewness	0.490388	0.102054
8	Kurtosis	1.839426	1.764209
9	Jarque-Bera	39.73152	26.99711
10	Probability	0.000000	0.000001
11	Result	Not Normal	Not Normal

Graph-1. Exchange Rates

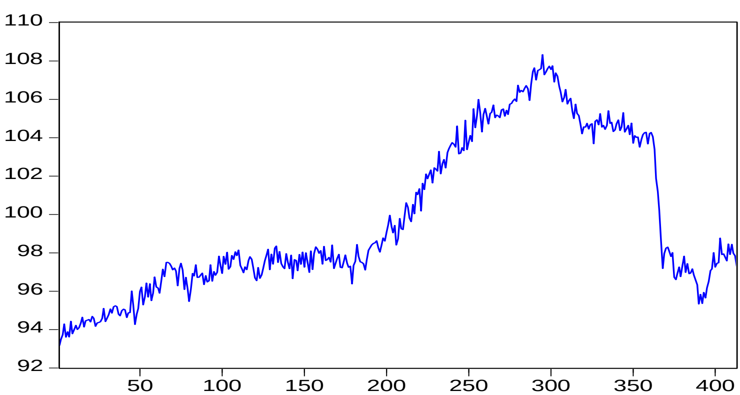


Graph-2. KSE 100 Index



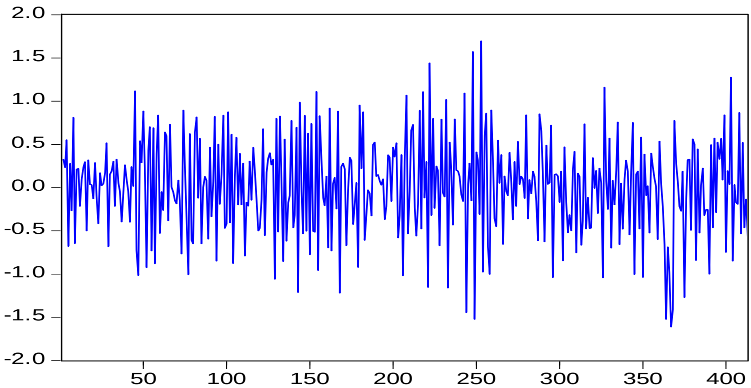
After conforming the non-normality of the two variables, in the next step the stationarity of time series data of the two variables is tested. The Graph-3 is the exchange rates or logarithm of exchange rate series (Pakistani rupees/US Dollar). As the graph shows that there is an upward trend followed by downward one or in other words we may say that the data is non-stationary at the level.

Graph-3. Exchange Rates



The Graph-4 shows that level variable in first difference becomes stationary or mean of the data is zero as if a line is drawn then values come to zero which is not the case when the graph was not stationary.

Graph-4. DExchange Rates



After the graphical representation of stationarity of the data series, the relevant test, the ADF test is used to check actual stationarity of the respective data. The Table-2 shows the statistics summary of ADF test. The null hypothesis is that the exchange rates has a unit root or the data series is non-stationary. The respective values of the statistics are computed at level. The dependent variable is D(Exchange Rates) which is regressed on Exchange Rates (-1), D(Exchange Rates(-1)), C (Constant) and Trend. The tabulated value (-0.400526) falls in the acceptance region. Moreover, the p-value is also greater than 0.05, therefore, the null hypothesis can be accepted to infer that data is non-stationary at level.

Table 2

Summary ADF Test

Null Hypothesis: EXRATES has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic based on SIC, MAXLAG=17)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.400526	0.9873
Test critical values:	1% level	-3.980544	
	5% level	-3.420794	
	10% level	-3.133113	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXRATES)

Method: Least Squares
Date: 01/30/15 Time: 11:20
Sample (adjusted): 3 413
Included observations: 411 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXRATES(-1)	-0.003321	0.008293	-0.400526	0.6890
D(EXRATES(-1))	-0.353518	0.046661	-7.576258	0.0000
C	0.416395	0.791943	0.525790	0.5993
@TREND(1)	-0.000347	0.000282	-1.229980	0.2194

R-squared	0.130444	Mean dependent var	0.009202
Adjusted R-squared	0.124034	S.D. dependent var	0.559286
S.E. of regression	0.523452	Akaike info criterion	1.552943
Sum squared resid	111.5190	Schwarz criterion	1.592054
Log likelihood	-315.1299	Hannan-Quinn criter.	1.568415
F-statistic	20.35158	Durbin-Watson stat	2.063038
Prob(F-statistic)	0.000000		

The Table-3 shows the values of test statistics at the first difference. Now the tabulated value (-29.27213) falls in the rejection region with p-value less than 0.05 calling rejection of null hypothesis suggesting that data is stationary at the first difference.

Table 3
Test Statistics – First Difference

Null Hypothesis: D(Exchange Rates) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic based on SIC, MAXLAG=17)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-29.27213	0.0000
Test critical values:	1% level	-3.980544	
	5% level	-3.420794	
	10% level	-	

3.133113

*MacKinnon (1996) one-sided p-values.

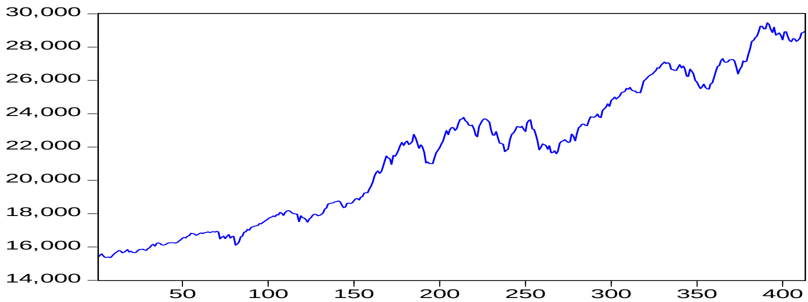
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(Exchange Rates ,2)
Method: Least Squares
Date: 01/29/15 Time: 10:24
Sample (adjusted): 3 413
Included observations: 411 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Exchange Rates (-1))	-1.355641	0.046312	-29.27213	0.0000
C	0.099887	0.051982	1.921548	0.0554
@TREND(1)	-0.000419	0.000218	-1.921255	0.0554

R-squared	0.677435	Mean dependent var	-0.002176
Adjusted R-squared	0.675853	S.D. dependent var	0.918458
S.E. of regression	0.522914	Akaike info criterion	1.548471
Sum squared resid	111.5629	Schwarz criterion	1.577804
Log likelihood	-315.2108	Hannan-Quinn criter.	1.560075
F-statistic	428.4298	Durbin-Watson stat	2.065011
Prob(F-statistic)	0.000000		

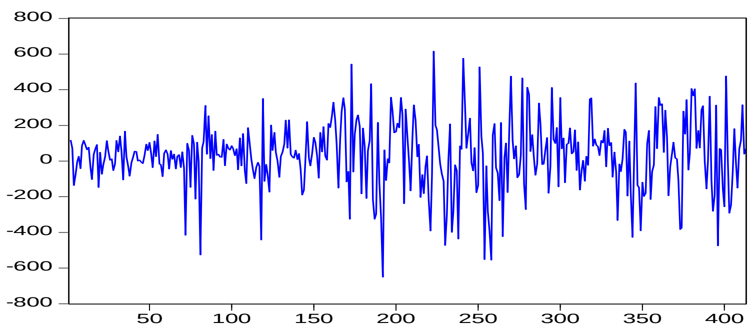
Coming to the second variable, the KSE 100 Index, the Graph-5 shows the logarithm of KSE 100 Index which indicates a steady upward trend which again visually indicates the non-stationarity of data at level.

Graph-5. KSE 100 Index



The Graph-6 shows the stationarity of data at first difference as by drawing a line it can be seen that mean of variable is zero.

Graph-6. DKSE 100 Index



After visual display, the ADP test is to be applied to support the above argument. The Table-4 shows the statistics of the ADF test for intercept and trend for which p-value is greater than 0.05. Therefore, null hypothesis may be accepted which indicates non-stationarity of data at level.

Table 4

ADF test for Intercept

Null Hypothesis: INDEX has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic based on SIC, MAXLAG=17)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.948253	0.1485
Test critical values:	1% level	-3.980544	
	5% level	-3.420794	

	10% level	-3.133113

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INDEX)
Method: Least Squares
Date: 01/31/15 Time: 10:37
Sample (adjusted): 3 413
Included observations: 411 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INDEX(-1)	-0.032781	0.011119	-2.948253	0.0034
D(INDEX(-1))	0.203007	0.048460	4.189187	0.0000
C	496.4375	162.7494	3.050319	0.0024
@TREND(1)	1.157377	0.389024	2.975082	0.0031

R-squared	0.055859	Mean dependent var	32.68659
Adjusted R-squared	0.048899	S.D. dependent var	189.7884
S.E. of regression	185.0900	Akaike info criterion	13.28925
Sum squared resid	13943131	Schwarz criterion	13.32836
Log likelihood	-2726.940	Hannan-Quinn criter.	13.30472
F-statistic	8.026509	Durbin-Watson stat	1.995026
Prob(F-statistic)	0.000033		

The Table 5 shows statistics at the first difference where p-value is less than 0.05 and accordingly the null hypothesis is rejected and we may say that data is stationary at the first difference.

Table 5
Statistics for First Difference

Null Hypothesis: D(INDEX) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic based on SIC, MAXLAG=17)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-16.71629	0.0000

Test critical values:	1% level	-3.980544
	5% level	-3.420794
	10% level	-3.133113

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INDEX,2)
Method: Least Squares
Date: 01/31/15 Time: 10:55
Sample (adjusted): 3 413
Included observations: 411 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INDEX(-1))	-0.812707	0.048618	-16.71629	0.0000
C	19.68785	18.57332	1.060007	0.2898
@TREND(1)	0.033110	0.077692	0.426172	0.6702

R-squared	0.406491	Mean dependent var	-0.122774
Adjusted R-squared	0.403582	S.D. dependent var	241.9153
S.E. of regression	186.8266	Akaike info criterion	13.30551
Sum squared resid	14240911	Schwarz criterion	13.33484
Log likelihood	-2731.283	Hannan-Quinn criter.	13.31712
F-statistic	139.7186	Durbin-Watson stat	1.987828
Prob(F-statistic)	0.000000		

In summary, for both variables, Exchange Rates and KSE 100 Index it was found that data series is non-stationary in the level but stationary at the first difference which is the precondition of using the Johansen test of Coinetgration. The optimum lags used in the Johansen Test of Coinetgration will be 2. The Table-6 shows the lag selection criteria consisting of (i). sequential modified LR test statistic, (ii). Final prediction error (FPE), (iii). Akaike information criterion (AIC). (iv). Schwarz information criterion (SC) and (v). Hannan-Quinn information criterion (HQ). The lower of the value of the respective criteria, the better will be the model.

All the taken criteria indicate that the optimal lag chosen should be 2.

Table 6

Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-5060.980	NA	1.94e+08	24.75785	24.77748	24.76562
1	-3067.174	3958.364	11521.74	15.02774	15.08663	15.05104
2	-3030.961	71.53975*	9842.591*	14.87023*	14.96836*	14.90905*
3	-3028.767	4.312747	9929.945	14.87906	15.01645	14.93342
4	-3025.342	6.700252	9957.955	14.88187	15.05851	14.95176

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

In the next step, we will use Johansen Test of Cointegration with the purpose to determine the long-term relationship between exchange rates and KSE 100 Index. The pre-condition of this test is that variables must be must non-stationary at level but when they are being converted into first difference, then they will be become stationery which means all variables should be integrated of same order only in that case we can run the Johnsen test of cointegration. This condition is already checked as discussed above. The null hypothesis is that there is no cointegration between exchange rates and KSE 100 Index. The Table-7 shows that the critical values at (5%) for both Trace Statistic and Max-Eigenvalue Statistic fall in the acceptance region. Moreover, the individual p-values are also greater than 0.05. Therefore, the null hypothesis is accepted to infer that there is no cointegration between exchange rates and KSE 100 Index.

Table 7

Critical Values at 5%

Date: 02/04/15 Time: 08:14
Sample (adjusted): 4 413
Included observations: 410 after adjustments
Trend assumption: Linear deterministic trend
Series: INDEX EXRATES

Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.009419	4.080281	15.49471	0.8970
At most 1	0.000488	0.200110	3.841466	0.6546

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.009419	3.880171	14.26460	0.8718
At most 1	0.000488	0.200110	3.841466	0.6546

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

As determined through the integration test, there is no long-term relationship between exchange rates and KSE 100 Index. Therefore, the Granger causality test is used to determine the causal relationship between the variables. The corresponding null hypotheses are as under:-

Ho1: KSE 100 Index does not Granger cause exchange rates.
Ho2: Exchange Rates do not Granger cause KSE 100 Index.
The Table-8 shows that F-Statistic for Ho1 is 0.86098 whereas p-value is greater than 0.05. That is why null hypothesis is accepted and we infer that KSE 100 Index does not Granger cause Exchange Rates. Coming to Ho2, the F-Statistics is 1.29213 and corresponding p-value is 0.2758. Here again null hypothesis is accepted to infer that Exchange Rates do not cause Granger Cause KSE 100 Index.

Table 8
F-Statistics for $H_0$1

Pairwise Granger Causality Tests
Date: 02/04/15 Time: 09:03
Sample: 1 413

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
KSE 100 Index does not Granger Cause Exchange Rates	411	0.86098	0.4235
Exchange Rates do not Granger cause KSE 100 Index		1.29213	0.2758

Conclusion

This study was conducted to determine the causal relationship between exchange rates and KSE 100 Index. In this regard, the use of Jarque-Bera test confirmed that data series of both the variables do not meet the criteria of a normal distribution which in turn required checking startionarity of both series. In this context, the ADF test was used which showed non-stationarity at level and stationarity at first difference which called for used of Johansensen Test of Cointegration. The same was applied to ascertain the long-term relationship between the variables of the study. The results showed no long-term relationship between the variables which implied that past data of either variable cannot be used to predict the one another. Therefore, Granger causality test was applied to check the causality between the respective variables. The results indicated that exchange rates do not Granger cause KSE 100 Index and vice versa therefore no causal relationship between exchange rates and KSE 100 Index may be inferred.

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