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STOCK PRICES AND EXCHANGE RATE DYNAMICS: EMPIRICAL EVIDENCE FROM EGYPT

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Abstract

The direction of volatility transmission between stock and foreign exchange markets is important for hedging strategy, portfolio management and financial market regulation. This paper examines volatility transmission between stock market price and foreign exchange markets in Egypt by applying the GARCH (1,1) model and Granger Causality Tests in the period from January 2003 to June 2016. The results of the estimated concluded that there was a significant inverse relationship between the stock market price and exchange rate. Were one percentage point increase in stock market price volatility will lead to a fall in the exchange rate by 0.03 percentage points, this result is consistent with Portfolio Balance Approach. The causality test results concluded that the hypothesis Stock does not Granger Cause Exchange is rejected in lags from fourth to twelfth month, Which means that there is one direction of causality runs from the stock market price to official exchange rate. This means that if the fluctuations occurred in the stock price in a month, the impact is transmitted to the exchange rate in the fourth month and remains the effect of such impact in exchange rates until the twelfth month, Which leads us to expect to reduce or increase the value of the currency will not affect the stock prices significantly affected, and we expect that any rise or fall in stock prices will result in a change in the exchange rate of the Egyptian pound.

Keywords: Stock Markets, Exchange Rate, Granger causality, GARCH(1,1), Egypt

INTRODUCTION

Establishing the relationship between stock prices and exchange rates is important for a few reasons (Dimitrova, 2005). First, it may affect decisions about monetary and fiscal policy. Gavin (1989) shows that a flourish stock market has a positive effect on aggregate demand. If this is

large enough, expansionary monetary or contractionary fiscal policies that target the interest rate and the real exchange rate will be overridden. Sometimes policy-makers advocate less expensive currency in order to boost the export sector. They should be aware whether such a policy might depress the stock market. Second, the link between the two markets may be used to predict the path of the exchange rate; this will benefit multinational corporations in managing their exposure to foreign contracts and exchange rate risk stabilizing their earnings. Third, the currency is more often being included as an asset in investment funds' portfolios. Knowledge about the link between currency rates and other assets in a portfolio is vital for the performance of the fund. The Mean-Variance approach to portfolio analysis suggests that the expected return is implied by the variance of the portfolio. Therefore, an accurate estimate of the variability of a given portfolio is needed. This requires an estimate of the correlation between stock prices and exchange rates. Does the magnitude of this correlation differ when the stock prices are the trigger variable or when the exchange rates are the trigger variable? Fourth, the understanding of the stock price-exchange rate relationship may prove helpful to foresee a crisis. Khalid and Kawai (2003), claim that the link between the stock and currency markets helped transmit the Asian Financial Crisis in 1997. It is believed that the sharp depreciation of the Thai Baht triggered depreciation of other currencies in the region, which led to the collapse of the stock markets as well. Awareness about such a relationship between the two markets would trigger preventive action before the spread of a crisis. Many theoretical models have analyzed the dynamic causal relationship between stock price and exchange rates. One of them is "Goods market approach" by Dornbusch and Fischer, (1980). Their model suggests that fluctuations in exchange rates influence the competitiveness of the firm in the market, as the variation in the exchange rate affect the value of the earnings and the cost of financing, which is borrowed in terms of foreign currencies to finance their operations and therefore the stock prices of the firm. When the exchange rate (domestic currency) depreciates it make the local products (exporting products) more attractive for foreigners and demand for these exporting goods increases in the foreign market and hence the revenue and value of the exporting firm is positively affected and therefore the stock price. On the opposite when the domestic currency appreciates, it makes exports expensive and unattractive for the importer on the other side, which negatively affects the revenues and value of the exporting firm. However, the effect of variation in exchange rate on the revenue and value of importing firm is opposite to that of an exporting firm. From the above premises, we can conclude that appreciation in the exchange rate is negatively related to the stock prices of the exporting firm and positively related to the stock price of importing firm. In addition to that, the variation in exchange rate also affects the value of receivables and payables of the firm. The appreciation of exchange rate appreciates the value of receivables,

mean receive more in terms of local currency, ultimately this appreciation of exchange rate appreciates the value of the firm. The effect of depreciation of the exchange rate is negative over the value of the firm. The appreciation and depreciation of the exchange rate also positively and negatively affect the payments of the firm and hence the value of the firm. Hence it can be concluded that, the intensity of the effect of changes in the exchange rate on stock prices is dependent upon the significance of foreign trade in the economy and the balance of payment imbalances at the macro level.

An alternate theory of exchange rate determination is the “Portfolio Balance Approach” (Frankel, 1983) and (Frankel, 1984) which supports the hypothesis about the causal relationship between stock prices and exchange rates. Portfolio balanced approach stresses that exchange rate are determined by the fluctuation in the equity market and work under the demand and supply framework. An upward moving stock market of the country grabs the attention of the foreign investors to invest in the stock and diversify their portfolios; hence the upward movement brings more foreign currency to the country and increases the demand for the local currency, which leads to an appreciation of the local currency. On the other side, when the stock market falls, the stocks lose its attraction to be added to the portfolio. And the investors then sell out their stocks to avoid further losses this leads to lower demand for local currency and the local currency depreciates. As a result the upward (downward) movement of the stock market of the country will lead to appreciate (depreciate) the exchange rate of the country.

As theoretical economics as well as empirical researchers are far from any consensus cognate to the interactions between stock markets and peregrine exchange markets, we will identify the nature of this relationship in Egypt in the period from January 2003 until June 2015.This study proceeds as follows. The next section presents a review of the pertinent empirical literature. Section 3 explicates methodological issues and describes the data employed. Section 4 contains the empirical results and the last section discusses the findings and summarizes the conclusions.

LITERATURE REVIEW

Aggarwal (1981), found a positive correlation between effective exchange rate of the US dollar and stock prices. Soenen and Hennigar (1988) infer strong negative interaction with the U.S. dollar effective exchange rate and U.S stock market index during 1980-1986. Ma and Kao (1990) explained the differences among countries in the nature of their economies, specifically by the strength of export or import sectors. According to these researchers, an appreciating currency negatively affects the domestic stock market for a country with a large export sector and positively affects the domestic stock market for an import-dominant country. Ajayi and

Mougoue (1996) investigate the short-and long- run relationship between stock prices and exchange rates in eight advanced economies. They find that an increase in stock prices causes the currency to depreciate for both the U.S. and the U.K. They explain this as follows: a rising stock market is an indicator of an expanding economy, which goes together with higher inflation expectations. Foreign investors perceive higher inflation negatively. Their demand for the currency drops and it depreciates. As to the currency effect on the stock market, the authors find that currency depreciation leads to a decline in stock prices in the short run. The authors explain this negative relationship as follows: exchange rate depreciation will suggest higher inflation in the future, which makes investors skeptical about the future performance of companies. As a result, the stock prices drop. This hypothesis is supported by data from the U.K. markets. Abdalla and Murinde (1997) investigated the interaction between the real effective exchange rates and stock prices in Korea, India, Pakistan and the Philippines. They found unidirectional causalities from exchange rates to stock prices in all sample countries except in the Philippines. Granger, Huang and Yang (2000) research whether currency depreciation led to lower stock prices or whether declining stock prices led to depreciating currencies during the Asian Crisis of 1997. The data on some of the Asian countries support the case of bivariate causal. Stock prices are expected to react ambiguously to exchange rates. The authors explain this with the effect of currency changes on the balance sheets of multinational companies. Depreciation could either raise or lower the value of a company, depending on whether the company mainly imports or mainly exports. When the stock market index is considered, the net effect cannot be predicted. The other hypothesis is that the currency will depreciate if the stock market declines (contrary to my expectation-which currency depreciates if the stock market is booming). This is explained as follows: in markets with high capital mobility, it is the capital flows, and not the trade flows that determine the daily demand for currency. A decline in stock prices makes foreign investors sell the financial assets they hold in the respective currency. This leads to currency depreciation. They showed a strong relationship between the two markets—causality was unidirectional in some cases and bidirectional in others. Whenever the relationship was unidirectional, it was found to be negative, regardless of which the lead variable was. For four of the countries the authors found evidence of joint causality. The direction (positive or negative) of the dual causality could not be determined, nor could it be specified which the trigger variable was. The reason for the disparity of results between the different countries might be the different degree of the capital mobility, trade volume and economic links among them. Another reason could be an omitted variable bias—for example interest rates may have an influence on stock and currency markets. This study reported that the data from South Korea were consistent with the traditional approach that exchange rates

lead stock prices. Conversely, the data for the Philippines were consistent with the portfolio approach: stock prices lead exchange rates with negative correlation. Data from Hong Kong, Singapore, Malaysia, Taiwan and Thailand indicated strong feedback relations. The data for Japan and Indonesia did not find any causal relationship. Sheng and Shuh (2004) studied the volatility spillover between the stock market and foreign exchange market for the period May 1979 to January 1999, and concluded that stock market volatility significantly affect the volatility of foreign exchange market.. Erbaykal and Okuyan (2007) studied thirteen developing countries and found a causality relationship only in eight countries' stock price and exchange rates. Five countries, variables produce new way causality, from stock prices to exchange rates. The bidirectional causality is found in three countries, stock prices and exchange rates. There was no causality for the remaining three countries. A study by Wickremasinghe (2012) on the relationship between stock prices and exchange rates in Sri Lanka found one unidirectional relationship from stock prices to the US dollar exchange rate for short-run in-sample causal relationships between stock prices and exchange rates. Olugbenga (2012) examined the short-run and long run effects of exchange rate on stock market development in Nigeria, theStudy results showed a significant positive stock market performance to the exchange rate in the short-run and a significant negative stock market performance to the exchange rate in the long-run.

METHODOLOGY

This paper empirically investigates the impact of stock market price volatility on exchange rate volatility. The sample of the study consists of monthly Egyptian stock market closed price (EGX 30), the monthly average official Exchange rate (LCU per US, monthly export to all over the world (Value of the US dollar) and monthly money supply data (M2) for a period from January 2003 to June 2016. The monthly Egyptian stock market closed price was obtained from www.investing.com while the exchange rate values were obtained from http://www.usforex.com, but exports values were obtained from www.trademap.org and the M2 source www.assetmacro.com.The data were then tested for stationery by using Augmented Dickey-Fuller (ADF) test in order to avoid constructing spurious regressions which can be occurred due to the problem of unit root that presence when working with nonstationary time series data. In order to analyze the impact of stock market price volatility on exchange rate volatility, this paper first employs the OLS method where equation (1) specifies the model that is estimated by OLS.

$$Log\ Exchange_t = \beta_0 + \beta_1\ log\ Stock + \beta_2\ export + \beta_3\ log\ M2 + \mu_t \qquad (1)$$

Where, log Exchange is the natural logarithm of monthly official Exchange rate where log Stock is the natural logarithm of the monthly stock market closed price; export is the monthly export to

all over the world; M2 monthly money supply;β_0 is the intercept; $\beta_1\beta_2\beta_3$ specify the coefficients of the parameters; and μ_t is the white noise error term. The suitability of this estimated OLS model, then tested with the Autoregressive Conditional Heteroscedasticity (ARCH) test.

Then the GARCH process, which was firstly introduced by Bollerslev (1986), employs to estimate the parameters where the GARCH (1,1) process is specified as follows:

Exchange $_t = \gamma_0 + \gamma_1$ *log Stock* $_t + \gamma_2$ *export* $_t + \gamma_3$ *log M2* $_t + \varepsilon_t$ *(2)*

$\sigma^2_t = \omega_0 + \alpha_1\varepsilon^2_t + \alpha^2\sigma^2_t$ *(3)*

The equation (2) is the mean equation and the equation (3) is the variance equation where the parameters are defined same as the previous model; γ_0 is the intercept; $\gamma_1 to \gamma_3$ are the coefficients of the estimated parameters of the mean equation. σ^2_t is the conditional variance where ω_0 is the mean; $\alpha_1\varepsilon^2 t$ is the news about volatility from the previous period, measured as the lag of the squared residual from the mean equation which is defined as ARCH term; and $\alpha_2\sigma^2_t$ is the last period's forecast variance which is defined as the GARCH term. The GARCH specification requires that in the conditional variance equation, parameters ω_0 . $\alpha_1, and \alpha_2$ to be non-negative and the sum of $\alpha 1\ and \alpha_2$ to be less than one to secure the covariance stationarity of the conditional variance.

Finally, the equation (4) and equation (5) are estimated by using the GARCH (1,1) model in order to capture the impact of stock market price exchange rate volatility on exchange rate volatility.

Log Exchange $_t = \emptyset_0 + \varepsilon_t$ (4)

$\sigma^2_t = \varphi_0 + \theta_1\varepsilon^2_t + \theta_2\sigma^2_t + \delta_1 Vol$ log Stock $_t + \delta_2 VOl$ export $_t + \delta 3 Vo$l log M2 $_t$ (5)

Where, Vol log Stock $_t$ is the volatility values of stock market price calculated through a GARCH (1,1) process; VOl export $_t$ is the volatility values of export values calculated through a GARCH (1,1) process; Vol log M2 $_t$ is the volatility values of money supply calculated through a GARCH (1,1) process to capture the impact of the stock market price volatilities on exchange rate volatilities.

ANALYSIS AND DISCUSSION

Descriptive Statistics and Stationarity

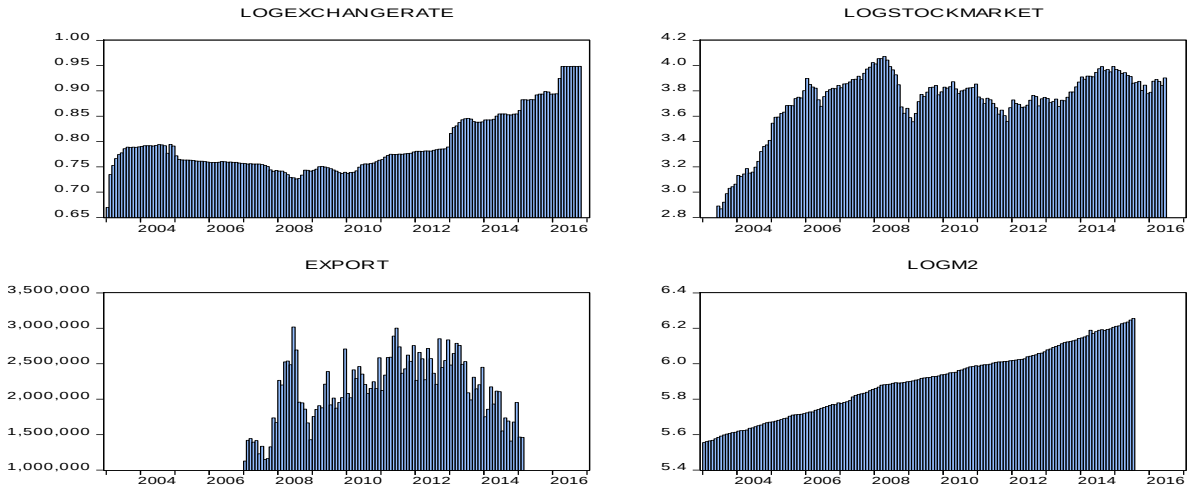
The descriptive statistics of the study demonstrated in the Table 1 where the data were tested for the normality through the JB test. The skewness should be 0 and kurtosis should equal to 3 in order to indicate that the variables are normally distributed where higher or lower kurtosis value indicates extreme leptokurtic or extreme platykurtic (Parkinson 1987). Based on the results obtained in Table 1 it is evident that the JB test has failed in exchange rate and stock

market indicated that these variables are deviated from normal distribution but export and M2 variables are normal distribution. Although, the results demonstrate positive skewness values for Exchange rate, Stock market price, and M2, indicating that the size of the right-hand tail is larger than the left-hand tail, but the Export data has a negative skewness, indicating that the size of the left-hand tail is larger than the right-handed tail. The kurtosis values of all variables are less than 3 indicating the presence of significant shorter and thinner tails than a normal distribution.

Table 1: Descriptive statistics

	Exchange	Stock	Export	M2
Mean	6.058365	6761.013	2138759	5.994463
Median	5.843391	6478.475	2187225	5.990440
Maximum	7.626739	11786.51	3017924	6.214142
Minimum	5.321983	3597.560	1127074.	5.775749
Std. Dev.	0.617784	1965.366	465315.8	0.117164
Skewness	0.829213	0.623577	-0.327881	0.182266
Kurtosis	2.243767	2.579085	2.315335	2.113776
Jarque-Bera	13.56592	7.074638	3.670063	3.749630
Probability	0.001133	0.029091	0.159608	0.153383
Sum	593.7197	662579.3	2.10E+08	587.4574
Sum Sq. Dev.	37.02076	3.75E+08	2.10E+13	1.331567
Observations	98	98	98	98

Figure 1. Official exchange rate, stock market price, export and money supply in Egypt



Unit Root and Counteracted Tests

The unit root test is in essence a stationary test. When running time series regressions, an implicit assumption here is that the variables of the time series are stationary. Time series are said to be stationary if their mean, variances and auto covariance's remain unchanged over the relevant period under study. Thus to find out whether the time series are stationary, we use the Augmented Dickey Fuller procedure to test for the unit roots. The test results are reported in table (2).

Table 2. Summary of ADF Unit Root Test Result

Augmented Dickey Fuller Test (ADF)						
	Constant			**Trend**		
Variable	Level	First-Difference	Conclusion	Level	First-Difference	Conclusion
Log Exchange	1.356	-12.86***	I(1)	-0.417	-8.883***	I(1)
log Stock	-3.69***	-10.27***	I(0)	-2.944	-10.536***	I(1)
Export	-3.46**	-9.88***	I(0)	-3.27	-10.06***	I(1)
log M2	0.382	-14.50***	I(1)	-1.48	-14.47***	I(1)

Notes: 1) For ADF and PP tests, ***, ** and * denote rejection of a unit root hypothesis based on Mackinnon (1991) critical values at 10%, 5%and1% respectively

The test results reported in table (2) indicate that all of the variables, namely the exchange rate, stock market price and money supply are stationary at first difference except export is stationary at level and first difference.

OLS estimation

The Table 3 demonstrates the results of OLS estimation. As per the results, it depicts that all of the independent variables, namely stock market price, export and money supply have a significant negative impact on the exchange rate in Egypt. However, the suitability of the regression OLS estimates, tests with the ARCH test.

The results of the ARCH test are presented in the Table 4 where if the squared residuals of the equation (1) contain autocorrelation or heteroscedasticity, the null hypothesis would be rejected. Thus, the results precisely demonstrate that the null hypothesis would be rejected at the 1% significance level indicating that classical OLS estimated coefficients are not effectively estimated so that inferences based on such coefficients are unreliable and unaccepted.

Table 3: OLS regression estimates

Dependent Variable: log exchange				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	1.21	0.050	23.96	0.000
logstock	-0.032	0.0046	-6.96	0.000
Export	-4.55	2.24	-2.034	0.044
M2	-0.056	0.01	-5.36	0.000
R-squared	0.79	Adjusted R-squared		0.785
Prob. (F-statistic	0.0000	Durbin-Watson stat		0.235

Table 4: Heteroskedasticity Test: ARCH

Heteroskedasticity Test: ARCH			
F-statistic	81.83	Prob. F(1,90)	0.000
Obs*R-squared	43.81	Prob. Chi-Square(1)	0.000

GARCH (1,1) model

The results of the estimated GARCH (1,1) are depicted in Table 5. Results show that there was a significant inverse relationship between the stock market price, M2 and exchange rate, thus consistent with the results derived from the OLS while there are significant positive relationship between export and exchange rate, different with findings from OLS. The coefficient of stock market price is negative and statistically significant, indicating that increases in stock market price dampen exchange rate. In other words, one percentage point increase in stock market price volatility will lead to a fall in the exchange rate by 0.03 percentage points, this result is consistent with Portfolio Balance Approach, Which concludes that the upward (downward) movement of the stock market of the country will lead to appreciate (depreciate) the exchange rate of the country. The coefficient of the M2 is negative and statistically significant, indicating that an increase in money supply will decrease the exchange rate. Whereas one percentage point increase in money supply volatility leads to decrease in the exchange rate by about 0.07 percentage points .

The coefficient of Export is positive and statistically significant, indicating that increases in Export volatility will increase the exchange rate. In other words, one percentage point increase in export volatility will lead to increase the exchange rate by 2.92 percentage points.

The results further show that in the conditional variance equation the intercept term is positive and statistically insignificant. Furthermore, the both ARCH and GARCH parameters are satisfying the non-negativity condition while both parameters are significant at 5% significance

level. As per results depicted in Table 5, it is evident that the GARCH parameter is significantly less than the ARCH term illustrating that the volatility of exchange rate are more sensitive to its new surprises than its own lagged values. Consequently, it would be stated that the effects of previous period's forecast summation of GARCH and ARCH parameters more than unity indicate that the shocks to the exchange rate have highly persistent effects and the response to volatility decays at a slower rate.

Table 5: Estimation of Exchange rate

Dependent Variable: logexchange				
Method: ML - ARCH (Marquardt) - Normal distribution				
GARCH = C(5) + C(6)*RESID(-1)^2 + C(7)*GARCH(-1)				
Variable	**Coefficient**	**Std. Error**	**Z-Statistic**	**Prob.**
C	1.26	0.022	56.39	0.000
logstock	-0.029	0.001	-15.03	0.000
Export	2.92	8.97	3.249	0.001
logM2	-0.069	0.004	-14.987	0.000
Variance Equation				
C	1.08	9.56	1.13	0.257
RESID (-1)^2	1.085	0.445	2.43	0.014
GARCH (-1)	0.189	0.076	2.46	0.013
R-squared	0.755	Adjusted R-squared		0.747
AKAIKE info criterion	-7.58	Hannan-Quinn criter		-7.504
Schwarz criterion	-7.39	Durbin-Watson stat		0.185

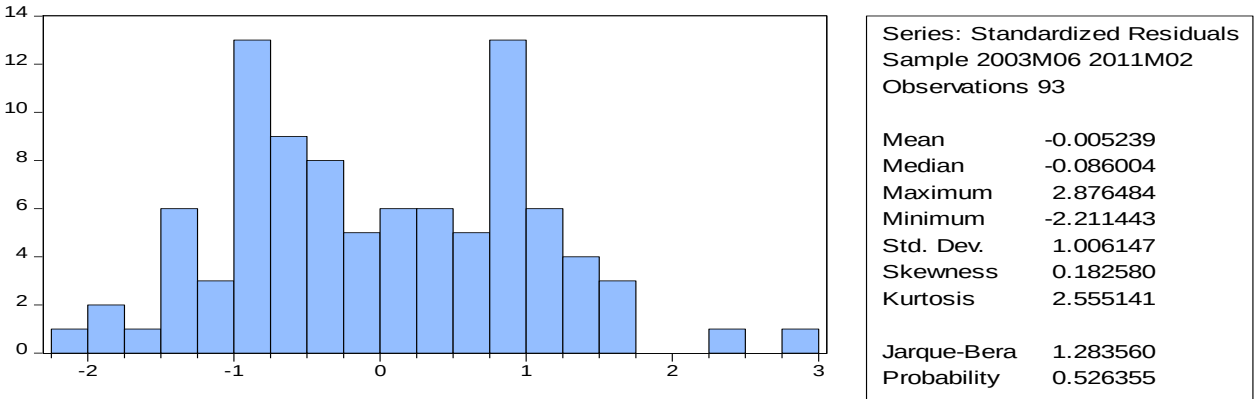
Diagnostic Tests

Gujarati (2004) argues that diagnostic tests should be performed so that the model finally chosen is a good model in the sense that all the estimated coefficients have the right signs, they are statistically significant on the basis of the t and F tests. In this regard, this study employs the Histogram and Normality test, Correlogram of Squared Residual Test, and the Heteroscedasticity test as its diagnostic tests.

Normality test

Normality test was conducted to test the residuals' normality. Economic theory expects the residuals to be normally distributed. Figure 2 presents the Normality test.

Figure 2: Normality test



Results from the Normality test show that the normal GARCH model best reduced the problems of fat tails and volatility clustering. The kurtosis and skewness are smaller under the normal GARCH model (2.55 and 0.–18 respectively). In this regard, it can be concluded that the residuals are normally distributed because Jarque – Bera Probability more than 0.05.

Heteroscedasticity test

The ARCH test was conducted to check the presence of heteroscedasticity in the residuals. Table 6 shows the ARCH test after using the GARCH model.

Table 6: Heteroscedasticity test; ARCH

Heteroskedasticity Test: ARCH			
F-statistic	1.414	Prob. F(1,90)	0.237
Obs*R-squared	1.423	Prob. Chi-Square(1)	0.232

Table 6 presents results for the ARCH test. Engle's LM test indicates that there are no more ARCH effects. The p value of the Obs*R-squared is not significant; it is greater than 0.05 and this indicates that there is no ARCH present. The p value is 0.232 and this shows that there is no heteroscedasticity in the residual.

Testing for autocorrelation: Q-statistic Test

From table 7 it can be observed that all p-values are above 0.05 and as a result of this the null hypothesis of no serial correlation is not rejected. This shows that there is no correlation in the residuals. This shows that the mean equation was correctly specified. Uh (2005) held that if the

mean equation (conditional variance equation) is correctly specified, all Q-statistics of standardised residuals should be insignificant with no observable autocorrelation.

Table 7: Correlogram of squared residual test

	AC	PAC	Q-Stat	Prob
1	0.124	0.124	1.474	0.225
2	-0.022	-0.038	1.522	0.467
3	-0.102	-0.096	2.536	0469
4	-0.024	-0.000	2.595	0.628
5	-0.110	-0.115	3.821	0.575
6	-0.009	0.008	3.8301	0.700
7	0.053	0.047	4.120	0.766
8	0.071	0.038	4.644	0.795
9	0.090	0.082	5.498	0.789
10	0.022	0.002	5.548	0.852
11	-0.126	-0.121	7.268	0.777
12	-0.102	-0049	8.4121	0.752
13	-0.071	-0.050	8.974	0.775
14	-0.141	-0.148	11.201	0.670
15	-0.135	-0.130	13.260	0.582
16	0.002	-0.028	13.261	0.654
17	0.072	0.015	13.863	0.677
18	0.031	-0.010	13.975	0.731
19	0.038	0.030	14.151	0.775
20	-0.134	-0.141	16.337	0.696

Granger Causality Tests

To check the causal relationship between Egyptian official exchange rate and stock market price, we have applied the Granger causality test using lag lengths of up to twelve periods. The test results are to be found in table (8) below. These results indicate clearly that the hypothesis that Stock does not Granger Cause Exchange is rejected in lags from four to twelve, Which means that there is one direction of causality runs from the stock market price to official exchange rate. This means that if the fluctuations occurred in the stock price in a month, the impact is transmitted to the exchange rate in the fourth month and remains the effect of such impact in exchange rates until the twelfth month, while the fluctuations that occur in exchange rates had no significant impact on stock prices in the following periods. Which leads us to

expect to reduce or increase the value of the currency will not affect the stock prices significantly affected, and we expect that any rise or fall in stock prices will result in a change in the exchange rate of the Egyptian pound.

Table 8: Results of Granger Causality Tests

Null Hypothesis	Observations	lags	F-statistics	Probability	Conclusion
Stock does not Granger Cause Exchange	156	1	0.345	0.557	No causality
Exchange does not Granger Cause Stock			0.660	0.417	
Stock does not Granger Cause Exchange	155	2	0.612	0.543	No causality
Exchange does not Granger Cause Stock			2.154	0.119	
Stock does not Granger Cause Exchange	154	3	0.473	0.701	No causality
Exchange does not Granger Cause Stock			1.693	0.171	
Stock does not Granger Cause Exchange	153	4	4.25***	0.002	Stock → Exchange
Exchange does not Granger Cause Stock			1.64	0.166	
Stock does not Granger Cause Exchange	152	5	3.580***	0.004	Stock → Exchange
Exchange does not Granger Cause Stock			1.022	0.406	
Stock does not Granger Cause Exchange	151	6	3.869***	0.001	Stock → Exchange
Exchange does not Granger Cause Stock			0.956	0.457	
Stock does not Granger Cause Exchange	150	7	3.60***	0.001	Stock → Exchange
Exchange does not Granger Cause Stock			1.087	0.374	
Stock does not Granger Cause Exchange	149	8	3.108***	0.003	Stock → Exchange

Table 8...

Exchange does not Granger Cause Stock			1.25	0.272	
Stock does not Granger Cause Exchange	148	9	2.670***	0.007	Stock → Exchange
Exchange does not Granger Cause Stock			1.46	0.167	
Stock does not Granger Cause Exchange	147	10	2.558***	0.007	Stock → Exchange
Exchange does not Granger Cause Stock			1.272	0.252	
Stock does not Granger Cause Exchange	146	11	2.109**	0.024	Stock → Exchange
Exchange does not Granger Cause Stock			1.203	0.291	
Stock does not Granger Cause Exchange	145	12	1.987**	0.031	Stock → Exchange
Exchange does not Granger Cause Stock			1.140*	0.334	

Note:*, **, *** indicates statistical significance at the 1%, 5% and 10 % level respectively.

CONCLUSION

This paper examines volatility transmission between stock market price and foreign exchange markets in Egypt by applying the GARCH (1,1) model in the period from January 2003 to June 2016. The results of the estimated concluded that there was a significant inverse relationship between the stock market price and exchange rate. Were one percentage point increase in stock market price volatility will lead to a fall in the exchange rate by 0.03 percentage points, this result is consistent with Portfolio Balance Approach, Which concludes that the upward (downward) movement of the stock market of the country will lead to appreciate (depreciate) the exchange rate in Egypt. The causality test results concluded that the hypothesis Stock does not Granger Cause Exchange is rejected in lags from fourth to twelfth month, Which means that there is one direction of causality runs from the stock market price to official exchange rate. This means that if the fluctuations occurred in the stock price in a month, the impact is transmitted to the exchange rate in the fourth month and remains the effect of such impact in exchange rates until the twelfth month, while the fluctuations that occur in the exchange rate had no significant impact on stock prices in the following periods.

FURTHER RESEARCH

Further study could take in more variables into the investigation. For example, to be related more to the different degree of the capital mobility, trade volume ,interest rate, inflation, Elasticities of both exports and imports, The size and quality of companies listed on stock market indexes and exchange rate regimes.

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