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An Empirical Investigation of Stock Market Evolution and Economic Growth in Egypt

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Abstract
This paper investigates stock market- economic growth nexus in the Egyptian economy using a Vector Error Correction Model. Various measures of stock market development such as market capitalization-GDP ratio, stock traded-GDP ratio, and turnover ratio were employed to test the long run relationship between stock market development and economic growth-with rate of change of real GDP as proxy for economic growth. Industry value added-GDP ratio was also included to achieve the objective of the study. The empirical results indicate that none of the stock market development indicators have a significant influence on economic growth. Although, market capitalization-GDP ratio and stock traded-GDP ratio have a positive relationship with economic growth, their relationship is insignificant in the long run. Moreover Industry Value Added-GDP ratio does not contribute to economic growth. However the speed of adjustment toward long run equilibrium value of 176% implies that it is adjusting speedily from short run divergence to long run equilibrium in GDP annual growth rate. Thus, policies that will encourage new listing; strengthen the trading system; boost stock market size, and lower transaction cost among others was recommended.
Keywords: stock market development; economic growth; VECM; Egypt.

1. Preface

It has been observed that in emerging economies indirect finance through the financial intermediaries is more important than direct finance through the financial markets. Several experimental studies have shown that financial variables play a very crucial role on the economic growth of any country. However most of the evidence uses bank-based measures of financial development such as ratio of liquid liability of financial intermediaries to GDP and domestic credit to the private sector divided by GDP thereby de-emphasizing the importance of stock market variables in the overall economic growth of the country. Not until recently has the emphasis increasingly shifted to stock market indicators, due to increasing role of financial markets in economies. A well-developed stock market has been identified as one of the major drivers of economic growth due to its crucial role of mobilizing financial resources for long term investment (Okey 2012). It helps to channel capital or long-term resources to firms with relatively high and increasing productivity thus enhancing economic expansion and growth (Alile 1997). The rising importance of stock markets has drawn the interest of researchers to study the impact of stock market development on economic growth. Although there are many of these researches, only few focus on developing economies such as Egypt. Not until recently has a study been conducted by Osama (2015) on the role of the stock market on the Egyptian economy, but the use of only one predictor variable by his study poses a serious limitation on the robustness of his findings for decision making. This study thus tries to resolve this gap by introducing other predictor variables such as total value of stock traded as a percentage of GDP and stock traded turnover ratio which may not only reveal a stronger model fit, but may add to variables that are significant for the purpose of predicting the long term relationship between stock market development and economic growth in Egypt.

2. Empirical and Theoretical Literature Appraisal

The role of stock market in the economic growth of economies cannot be over-stressed. Empirical investigations on this topic has shown that there are many possible effects of stock market on economic growth but the effects are of highly uncertain magnitude and conflicting direction. The debate for stock market and economic growth were supported by various empirical studies such as Levine and Zervous (1993), Javanonic (1993), Rousseau and Wachtel (2000), and Beck and Levine (2003). Stock market contributes to the mobilization of domestic savings by enhancing the set of financial instruments available to savers to diversify their portfolios, providing an important source of investment capital at relatively low cost. A well-functioning and liquid stock market, that allows investors to diversify away unsystematic risk, will increase the marginal productivity of capital (Pagno 1993). Development of stock market has impact on the operation of banking institutions and hence, on economic growth. This means that stock market is becoming more crucial, especially in a number of emerging markets and their role should not be ignored (Kahn and Sendahji 2000).

Several literatures in this area have drawn attention to the increasing role of stock markets in economic growth. In a study conducted by Atje and Jovanovic (1993), they test the hypotheses that stock markets have a positive impact on growth performance. They find significant correlations between economic growth and the

value of stock market trading divided by GDP for 40 countries over the period 1980-88. Similarly Levine and Zervos (1996) and Singh (1997) show that stock market development is positively and robustly associated with long run economic growth. In addition, using cross-country data for 47 countries from 1976-1993, Levine and Zervos (1998) find that stock market liquidity is positively and significantly correlated with current and future rates of economic growth, even after controlling for economic and political factors. They also find that measures of both stock market liquidity and banking development significantly, predicts future rates of growth. They followed the line of "Demiurgic-Kunt and Levine (1996b) by adopting measures such as stock market liquidity, size and integration with world market, into index of stock market development. The therefore, conclude that stock market provided important but different financial services from banks. More so, using cross-country data for 15 European Union Member-States, Adamopoulos (2010) find that stock and credit market development have positive direct effect on economic growth for nine of the countries studies. The data used covered from 1965-2007. In another study conducted by Tokundo (2000), the result of the study established positive links between the stock market and economic growth and, therefore, suggest the pursuit of policies geared towards rapid development of stock market in Nigeria. Abu N. (2009), using the error correction technique examined whether stock market development raises economic growth in Nigeria. The findings indicate that stock market development (market capitalization- GDP ratio) propels economic growth. He however recommends that such measures which obstruct stock market development should be jettisoned. These measures include tax, legal and regulatory barriers; creating an enabling environment where business can strive by developing the nation's infrastructures; putting in place employment policies that will increase the productivity and efficiency of firms as well as encouraging the Nigerian Securities and Exchange Commission to facilitate the growth of the market; restore the confidence of stock market participants and safeguard the interest of shareholders by checking sharp practices of market operators among others. Demiurgic-Kunt and Vlaksi-movic (1998) further stressed the corresponding role of the stock market and banks that they were not rival or alternative institutions using 30 countries from 1980 to 1991.

Existing models suggest that stock market development is a multifaceted concept, involving issues of markets size, liquidity volatility, concentration, integration with world capital markets and institutional development. Using data on 44 developed and emerging markets from 1986-1993, Demirguc-Kunt and Levine (1996a) find that large stock markets are more liquid, less volatile and more internationally integrated than smaller markets. More so, institutionally developed market with strong information disclosure laws, international accounting standards, and unrestricted capital flows are larger and more liquid markets.

Theory also points out a rich array of channel through which the stock markets –markets size, liquidity, integration with world capital markets and volatility –may be linked to economic growth. For example, Pagano (1993) shows that increased risk-sharing benefits from larger stock market size through market externalities, while Levine (1991) and Bencivenga, Smith and Starr (1996) show that stock markets may affect economic activity through the creation of liquidity. Similarly Devereux and Smith (1994) and Obstfeld (1994) show that risk diversification through internationally integrated stock markets is another vehicle through which the stock market can affect economic growth.

Besides stock market size, liquidity, and integration with world capital markets, theorists have examined stock return volatility. For examples, De Long et al (1989) argue that excess volatility in the stock market can hinder investment, and therefore growth.

3. Model Specification and Methodology.

The model specifies that economic growth represented by annual growth rate of GDP is considerably influenced by the capital market, and real sector indicators i.e. market capitalization-GDP ratio, stock traded-GDP ratio, turnover ratio, and industry value added-GDP ratio.

GDP = F (MC, ST, TR, IND)……eq1

Where the *a priori* expectation is:

a1 > o, a2 > o, a3 > o, a4 > o.

According to the empirical studies of King and Levine(1993a); Vazakidis and Adamopoulos [(2009b) and (2009d)], the variable of economic growth (GDP) is measured by the rate of change of real GDP. Therefore, from eq1 above:

GDP = Gross Domestic Product Annual Growth Rate (Dependents Variable); MC = Market Capitalization-GDP ratio (Independent variable);

ST = Stock Traded-GDP ratio (Independent variable); TR = turnover ratio (Independent variable), and IND= Industry Value added-GDP ratio (Independent Variable); μ =Disturbance term, and a1 - a4 = Coefficient of independent variables.

The secondary data set comprises of annual time series spanning from 1988-2014 extracted from the World Bank databank.

4. Empirical Results and Discussion.

Augmented Dickey Fuller (ADF) unit root test was conducted on all the variables and were found stationary at first difference. Consequently, Johansen co- integration test was conducted to know if there is a long run equilibrium relationship among the variables. Since they are co-integrated - meaning they have a long run equilibrium relationship - we run the Vector Error Correction Model. The tables 1, 2 & 3 below show the *Eviews8* outcome of the ADF unit root test, Johansen co-integration test and VECM test respectively.

Table.1 Outline of the Dickey Fuller Unit Root Test.

		ADF	Critical Values 1%	5%	10%	Prob.
GDP	**Level**	**-3.85383**	**-3.78803**	**-3.01236**	**-2.64613**	**0.009**
	1st d/f	**-7.31469**	**-3.72407**	**-2.98623**	**-2.63260**	**0**
MKT	**Level**	**-1.48383**	**-3.71146**	**-2.98104**	**-2.62991**	**0.526**
	1st d/f	**-3.84436**	**-3.72407**	**-2.98623**	**-2.63260**	**0.008**
ST	**Level**	**-2.37631**	**-3.72407**	**-2.98623**	**-2.63260**	**0.158**
	1st d/f	**-2.91063**	**-3.72407**	**-2.98623**	-2.63260	**0.058**
	2nd d/f	**-4.47330**	**-3.80855**	**-3.02069**	**-2.65041**	**0.002**
TR	**Level**	**-1.95892**	**-3.71146**	**-2.98104**	**-2.62991**	**0.302**
	1st d/f	**-3.77932**	-3.78803	**-3.01236**	**-2.64612**	**0.010**
IND	**Level**	**-1.61000**	**-3.73785**	**-2.99188**	**-2.63554**	**0.462**
	1st d/f	**-3.71388**	-3.83151	**-3.02997**	**-2.65519**	**0.013**

Table.2 Outline of Johansen Co-integration Test.

Included Observation: 25 after adjustment. Trend assumption: Linear deterministic trend Series: GDP IND MKT ST TR. Lags interval (in first differences): 1 to 1				
Unrestricted Co-integration Rank Test (Trace)				
Hypothesized No. of C.E	**Eigenvalue**	**Trace Statistic**	**Critical Value(0.05)**	**Prob.**
None *	0.748047	72.81233	69.81889	0.0283
At most 1	0.516112	38.3495	47.85613	0.287
At most 2	0.400502	20.20198	29.79707	0.4092
At most 3	0.197429	7.41039	15.49471	0.5304
At most 4	0.073629	1.912021	3.841466	0.1667
Unrestricted Co-integration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**Critical Value(0.05)**	**Prob.****
None *	0.748047	34.46283	33.87687	0.0425
At most 1	0.516112	18.14752	27.58434	0.4829
At most 2	0.400502	12.79159	21.13162	0.4716
At most 3	0.197429	5.498369	14.2646	0.678
At most 4	0.073629	1.912021	3.841466	0.1667

Trace test indicates 1 co-integrating eqn(s) at the 0.05 level.
Max-eigenvalue test indicates 1 co-integrating eqn(s) at the 0.05 level.
*** denotes rejection of the hypothesis at the 0.05 level.**
****MacKinnon-Haug-Michelis (1999) p-values.**

From table 2 above, the trace and max-eigenvalue test show that there is one error correction term or co-integrating equation. The existence of co-integration among the variables indicates that there is a long run equilibrium relationship among the variables in the model.

Table 3. Outline of the Vector Error Correction Model Estimates.

Dependent Variable: D(GDP); Method: Least Squares; Included observations: 25 after adjustments; Sample (adjusted): 1990 2014.				
Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ECM(-1)	-1.761311	0.764246	-2.304638	0.0333
D[GDP(-1)]	0.163851	0.424554	0.385936	0.7041
D[IND(-1)]	-0.123288	0.255096	-0.483301	0.6347
D[MKT(-1)]	0.000368	0.027433	0.01341	0.9894
D[ST(-1)]	0.057961	0.100568	0.576337	0.5715
D[TR(-1)]	-0.022841	0.040256	-0.567377	0.5775
C	-0.030562	0.292856	-0.104359	0.918
R^2	0.54775		**Mean dep. Var.**	-0.109744
Adjusted R^2	0.397		**S.D. depend. Var**	1.75153
S.E.of regression	1.360117		**Akaike info. crit.**	3.684514
Sum squared res	33.29851		**Schwaz criterion**	4.025799
Log likelihood	-39.05642		**Hannan-Q. criter**	3.779172
F-statistic	3.633501		**Durbin-Watson**	2.090795
Prob(F-statistic)	0.015378			

From the estimated VECM output above, the VECM equation is given below:

$$\Delta GDP_t = -0.03 + 0.16.GDP_{t-1} - 0.12.IND_{t-1} + 0.0004.MKT_{t-1} + 0.06.ST_{t-1} - 0.02.TR_{t-1} - 1.76.ECM_{t-1} \ldots\ldots\ldots\ldots eq2$$

The VECM equation (eq2) above was tested for serial correlation, heteroskedasticity and normality. The results of the tests, as presented in Tables 4, 5 and 6 below, show that our model specification is plausible and viable for econometric analysis.

Table 4. Outline of Breusch-Godfrey Serial Correlation LM Test:

F-statistic	**0.262196**	**Prob. F(2,16)**	**0.7726**
Obs*R-squared	**0.793359**	**Prob. Chi-Square(2)**	**0.6725**

H_0=There is no serial correlation.

From table 4 above, the observed R^2 value of 0.79 suggests the acceptance of the null hypothesis which indicates that there is no serial correlation in our model and this is plausible.

Table 5. Heteroskedasticity Test: Breusch-Pagan-Godfrey.

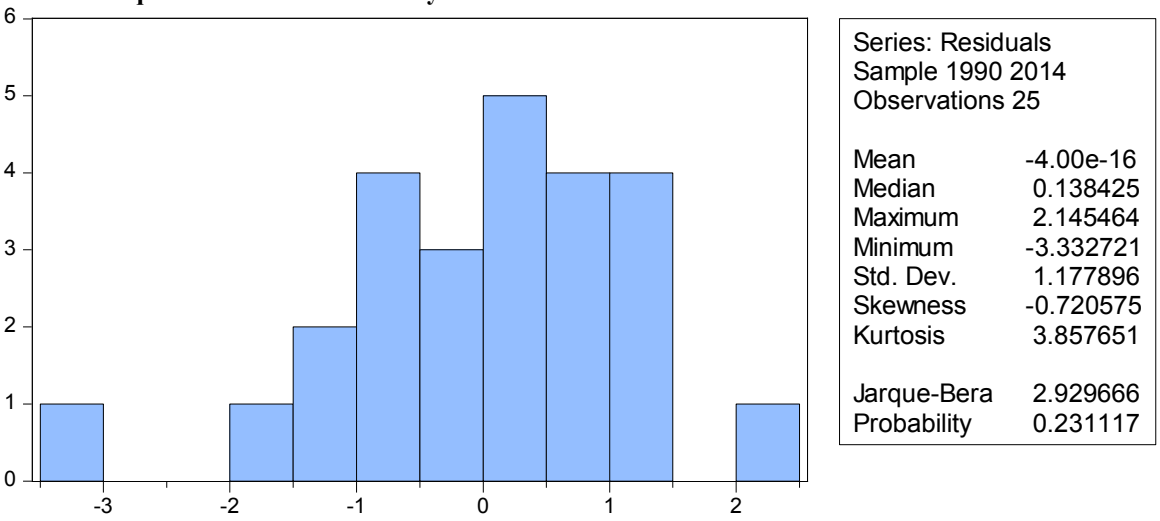
F-statistic	**0.697357**	**Prob. F(10,14)**	**0.7131**
Obs*R-squared	**8.312332**	**Prob. Chi-Square(10)**	**0.5984**
Scaled explained SS	**6.156971**	**Prob Chi-Square(10)**	**0.8019**

H_0=There is no heteroskedasticity OR Model is homoscedastic.

From table 5 above, the observed R^2 value of 8.31 suggests the acceptance of the null hypothesis which indicates that our model is homoscedastic and this is plausible.

Also, from table 6 below, the probability value of 0.23 suggests the acceptance of the null hypothesis which indicates that our residual is normally distributed and this is plausible.

Table 6. Jaque Bera Test of Normality.



H_0= Residual is normally distributed.

From the VECM model estimates in table 3, one can observe that the speed of adjustment toward long run equilibrium otherwise known as the error correction term is -1.76. By implication, the speed of adjustment is 176% meaning that it is adjusting very fast from short run divergence to long run equilibrium in GDP annual growth rate. This implies that 176% of the divergence is corrected every year. Furthermore, by the virtue of this term being negative and significant implies that the stock market indicators and real sector growth indicator have influence on GDP in the long run.

From equation 2 above, market capitalization- GDP ratio and stock traded-GDP ratio are positively related to GDP in the long run. This conforms to the *a priori* expectation, although their relationship is not significant at 5% level of significance. By implication, a 1% increase in market capitalization- GDP ratio and stock traded-GDP ratio will lead to 0.0004% and 0.06% increase in GDP growth respectively. Both turnover ratio which measures the stock market liquidity and IND have a negative and insignificant relationship with GDP and this does not conform to the *a-priori* expectation.

Many profitable investments require a long-term capital investment, but investors are frequently unwilling to surrender their savings for long periods. Measures to boost the Egyptian equity market liquidity will make investment less risky and more appealing because they afford savers the opportunity to purchase an asset – equity - and to sell it hurriedly and cheaply if they need access to their savings or want to alter their portfolios. More so, it will reduce transaction cost and allow for the diversification of risk. Thus, the stock market may affect economic activity through the creation of liquidity.

5. Summary, Conclusion and Recommendation.

So far, this study investigates the connection between stock market evolution and economic growth in Egypt. Measures of stock market development such as market capitalization-GDP ratio, stock traded-GDP ratio and turnover ratio were used to investigate the relationship between stock market evolution and economic growth, with GDP annual growth rate as proxy for economic growth. Industry value added-GDP ratio was also included in the model to achieve the objective of the study. The empirical results indicate that none of the stock market development indicators have a significant influence on economic growth. Although, market capitalization-GDP ratio and stock traded-GDP ratio have a positive relationship with economic growth, their relationship is insignificant in the long run. Moreover Industry Value Added-GDP ratio does not contribute to economic growth.

Thus measures that will boost the stock market liquidity - such as encouraging new listing and strengthening the trading system - are recommended here. Furthermore, a high turnover ratio is often used as an indicator of low transaction costs, and stock market liquidity. Reduction in transaction cost will go a long way to improve the stock market liquidity and stock market liquidity ultimately promotes economic growth.

Additionally, it is suggestive that reviving the industrial sector of the Egyptian economy will spring the demand for the services of the stock market.

Effort should be geared towards increasing the stock market size by way of increasing the number of listed shares of companies. It is assumed that overall market size is positively correlated with the ability of the market to mobilize capital for long term growth, and diversify risk on an economy-wide basis.

In conclusion, it is recommended that a study which compares the connection between stock market evolution and economic growth in Egypt with that of other North African countries such as Morocco, Algeria, Libya, Sudan and Tunisia be carried out to determine how the result varies among countries with similar economic structures.

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