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Stock Market Capitalization, Capital Formation and Growth Evidence from Saudi Arabia

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Abstract

This study investigates the relationship between stock market capitalization and economic growth in Saudi Arabia. The study encompasses capital formation in a trivariate system for the period covering 1985 to 2012.The study employed the unit root tests and applied Johansen co-integration to investigate cointegration among the variables under study.Granger causality test is employed to identify the direction of causality among the variables. Vector Autoregressive Model reveals the existence of relationship between economic growth and stock market capitalization. The results of Granger causality tests manifest that stock market capitalization and capital formation causes economic growth in the Kingdom of Saudi Arabia. Further the stock market capitalization also causes the capital formation in the economy. Based on these outcomes, it can be cogently deduced that further development of Saudi stock market shall go a long way to substantiate the pace of the growth of the economy.

Key Words: *Saudi Arabia, Stock market development, economic growth, Causality, VAR.*

Introduction

Attaining accelerated economic growth is one of the central aims for the policy makers. Enhanced economic growth has favorable effect on the multifarious spheres of the economy. Umpteen researches have sifted through to illustrate the quintessence of economic growth. It is cogently revealed that the central direction of the purported studies in the sphere of economic growth is to unearth the cardinal ingredients that stimulate the pace of growth of the economy. Through the literature on the purported theme, it is unfolded that the levels of infrastructure, political stability, physical & human capital, development of technology, capital formation and financial intermediations are the prime ingredients for enhancing the pace of economic growth in the economy**.**

Eminent economists have unfolded that the pace of growth of capital and technical advancement has led to accelerated economic growth (Kuznets1971,1973; Solow,1957). (Jorgenson, Gollop and Fraumeni,1987) disclosed that from 1948 to 1979,capital formation represented for 46 percent of the economic growth of

United States.Capital formation assists in ascertaining the level of production, which per se, influence the growth of the economy. Studies like Romer (1986) and Lucas (1988) manifest the importance of capital formation in the enhancement of growth. Capital formation encompasses two facets, namely, the Gross Capital Formation (GCF) and Net Capital Formation (NCF).Like wise, the studies have manifested the potent of stock markets in enhancing the economic growth of the economies.Empirical studies covering cross country data reveals that there is positive influence of stock market in escalating the growth of the economy(Levine and Sara, 1996; Levine and Zervos ,1998; Henry,2000; Bekaert et al ,2005).In this very vein, the current endevour is undertaken to investigate the relationship between stock market capitalization and economic growth in Saudi Arabia. The study encompasses capital formation in a trivariate system.

The rest of this paper is ordered as follows: Section 2 provides an overview of Stock Market Capitalization, Capital Formation and Growth in the Saudi economy. Section 3 presents the literature review on the stipulated topic. Section 4 encompasses the methodology employed and the discussion of the results. Section 5 covers the conclusion of the study.

An overview of Stock Market Capitalization, Capital Formation and Growth in the Saudi Economy

Saudi Arabia is the only Arab country to be ranked among the high income economies (G-20 economies).Since the starting of the twenty first century, Saudi economy has witnessed a period of unwavering oil boom. The economy yields more than 90 percent of the fiscal revenues and 80 percent of the export revenues from the trade in oil. Saudi economy exhibited the high growth on account of substantial hike in the oil prices. Thus the economy hinges on the dynamics of international oil markets. Increased oil prices resulted in acceleration of private arena, enhancement in the government outlays and in revamping the domestic settings. Further the rise in oil prices led to substantial fiscal revenues and waned the national debt level. Economic policies at the higher rung have been commercial -centric and have evinced interest in the promotion of private investment and job creation.Further, the government machinery has undeviatingly carried out multiple steps to diversify the economy and to enhance the pace of non-oil arena.

Through the World Bank report, it is revealed that during the time period of 1970 to 2012, the capital formation of the economy mounted to US$182.4 billion. The average annual growth of the capital formation in the economy was US $4.3 billion (359%). It is manifested through the report that the average annual growth of capital formation per capita in Saudi Arabia was US$148.5 or 71.6 per cent.

Saudi stock market is acknowledged as leading equity market in the Middle East region. Saudi market has been principal market in issuance of Initial Public Offering (IPOs) in the region. Over the period of time, it is revealed that the Saudi Capital Market got remodeled from being mere regulatory and legal machinery to an enhanced transparency system. In line to the need of the time during the 1990s, the kingdom unfolded a set of economic reforms so as to attract the investment in the stock market. From 1984 to 2003, the supervision of the stock market was under the ambit of Saudi Arabia Monetary Agency (SAMA).From 2003 onwards, Saudi stock market is supervised under the tutelage of the Capital Market Authority (CMA). In 2001, Tadawul, the new securities trading, clearing and settlements got kicked off. In this line, the stock market got transformed from a mutually-owned organization to a Joint Stock Company in 2007.Currently, Tadawul All Share Index (TASI) comprises of 169 listed companies that are branched into fifteen sectors. Of late, the Saudi stock market has exhibited a swift growth in terms of both the listed companies and the scope of the different sectors. During the time span (2004-2014), the listing of companies doubled from 70 to 169 and the sectors escalated from 8 to 15.This progress speaks volume of efforts undertaken by the CMA to diversify and expand the fabric of the economy. Currently, Tadawul is the most liquid and largest in the MENA region, with a market capitalization exceeding US$530.0bn and trading nearly US$2.5 billion worth of shares a day. On June 15, 2015, the kingdom unfolded the landscape of its stock market to the foreigners' investors as part of the endeavor to diversify the economy.

From the World Bank report, it is manifested that the average annual GPD growth rate of Saudi Arabia has witnessed spectacular rise from 2.1 percent during 1990-2000 to 5.9 percent during the period of 2000-2009. IMF's computation reveals that the GDP for Saudi Arabia during 1990-2010, has been primarily on account of enhanced labour and capital ingredients. Explicitly, out of the average 3.2 percent GDP growth achieved by Saudi economy during the stipulated period, a 1.5 percentage point is on account of physical capital. Likewise, the growth rate progressed to 6.6 percent during the period of 2009-2013.In sum, during the period (2000-2014), the Saudi economy witnessed meteoric rise in the economic growth. The major economic and financial sector reforms at the domestic level have goaded the growth rate.The GDP growth is estimated to contract to 2.8 in the current year and likewise decrease to 2.4 in the ensuing year due to substantial drop in oil price. Though the current economic settings of the country can wane the economic growth in the short run, but it is sanguinely expected that the economic growth shall enhance in the long run.The extant literature pertains to the stock market and the growth in the economy.

Literature Review

Obstfeld (1994) reveals that the mechanism of internationally linked stock markets leads to sharing of international risk, which advances the resource allocation and stimulate the pace of growth.In line, Bencivenga, *et. al*. (1996) and Levine (1991) have shed light on the prowess of stock market in acceleration of economic growth.Beck & Levine (2004) examine the influence of stock markets and banks on economic growth employing a panel data set for the time span 1976–1998.The study revealed that the stock markets and banks have favorable weight on the domain of economic growth. Bekaert, Harvey & Lundblad (2005) examined data of multiple countries and revealed that the liberalization of the stock market contribute to an approximate one percent enhancement in the annual real economic growth over a time span of five years. Levine&Zervos (1996) investigate the association between the stock market development and economic growth. The study covered data pertaining to 41 countries from the 1976 to 1993.The study encompass the range of the development of stock market gauged by the volume, liquidity and diversification, while the economic growth was covered by real per capita growth rate. The study revealed robust linkage between the purported variables.Naik & Padhi (2015) investigate the impact of stock market development on economic growth employing a panel data of 27 emerging economies from 1995 to 2012.The study encompasses the stock market-based indicators such as market capitalization, value of share traded and turnover ratio. The study reports that the stock market development substantially adds to economic growth. Van Nieuwerburgh, Buelens & Cuyvers (2006) examines the long- period linkage between financial market development and economic development in Belgium. The study reveals substantial indications that stock market development caused economic growth in Belgium. Rousseau & Wachtel (2000) imparted a time dimension and investigate the relationship between equity markets and growth for 47 countries in a panel ambience with annual frequency data for 1980 -1995.The study underscore the significance of the stock markets deepening for economic growth.

Vazakidis and Adamopoulos (2009) examined the causal linkage between stock market development and economic growth for France for the period 1965-2007 employing a Vector Error Correction Model (VECM).The study unfolded that the economic growth has a positive effect on stock market development.Enisan & Olufisayo (2009) investigate the long run and causal linkage between stock market development and economic growth for seven countries in sub-Saharan Africa. The study reveals that the development of stock market is cointegrated with economic growth in Egypt and South Africa. Arestis, Demetriades and Luintel (2001) employing the time series data on selected five countries reveals that stock markets stimulate the growth pace in the economies.

Naceur, Ghazouani & Omran (2008) employs annual frequency data from 11 MENA countries for 1979 to 2005.The study reports that the opening of the stock market has made no impact on the growth of the economic and investment settings. Nurudeen, A. (2009) examines whether stock market development enhance economic growth in Nigeria, by using the error correction approach. The results presents that stock market development stimulates the economic growth of the economy.Wild & Lebdaoui (2014) investigates

the linkage between stock market development and economic growth in Morocco from 2000 to 2013. The study reports long run linkage between stock market development & economic growth and exhibit unidirectional Granger-causalities directing from MASI, traded volume and stock market index to the real GDP. Mohtadi & Agarwal (2001) investigates the linkage between stock market and economic growth through the employment of a dynamic panel approach for 21 emerging markets over the time span of 21 years. The study manifests a positive linkage between the selected indicators of the stock market performance and economic growth.Olweny & Kimani (2011) examined the causal linkage between stock market and economic growth in Kenya for the time period 2001-2010.The study revealed that the causality runs in one direction from the NSE 20-share index to the GDP.Cooray, A. (2010) reveals that the stock market play a central ingredient in achieving the long growth of selected countries investigated. The study put forward a set of strategies in order to enhance the economic growth. Shahbaz, Ahmed & Ali (2008) examine the linkage between stock market development and economic growth in Pakistani economy from 1971 to 2006.Through the usage of J-J Co-integration and ARDL bounds testing approach, the study shows substantial linkage between stock market development and economic growth.

In line, selected studies focusing on the linkage between stock maket and capital formation are incorporated.Sarkar (2007) reveals that from 1950 to 2004, private fixed capital formation has no linkage with the share price movements in Indian economy. In line, Sarkar (2006) with a sample of 31 less developed countries manifest that cross-country variations in stock market capitalization do not clarify the cross-country variations in the growth rates of gross fixed capital formation. The time series analysis of 15 countries demonstrates that in the display of 10 cases, there is no favorable long-run linkage between the stock market turnover ratio and the growth of capital accumulation.

Back and Levine (2003) unfolds that favorable relationship appears between stock market development and capital formation. The stock markets support the business houses to garner long term finance for investments purpose. The study reiterates the potent of the capital market in generating substantial financial resources required to augment fixed capital in the country.Sarkar (2007) examined the data of 37 countries covering the developed and less developed countries during the time period 1976 to 2002. The study reveals that for the developed markets (encompassing US & UK), there is no favorable linkage between stock market and gross fixed capital formation. But the study reveals that stock markets having the French or German-origin civil law exhibit favorable linkage. Berndt & Morrison (1995) exhibits that industries with more percentage of high-tech capital leads to higher economic performance.Selected studies on the causal linkage between capital formation and economic growth are reviewed.

Uneze (2013) investigate the causal linkage between capital formation and economic growth in Sub-Saharan African countries employing recent panel cointegration and causality testing techniques. The study reveals that causality is both ways, signifing that higher economic growth contributes to higher capital formation and which further leads to higher economic growth. Levine and Renelt (1992) present positive substantial linkage between growth and the share of investment in GDP. Bond, Leblebicioglu, and Schiantarelli (2010) employing annual data for 75 countries for the time period 1960–2000, demonstrate favorable linkage between investment as a share of gross domestic product (GDP) and the long-run growth rate of GDP per worker.

Blomstrom, Lipsey, and Zejan (1996) investigate the shares of fixed capital formation in GDP and rates of economic growth for more than 100 countries over successive 5-year periods between the time frame of 1965 and 1985 to ascertain the direction of causality between the stipulated variables.The study revealed that the high rates of fixed capital formation go along with the fast growth in per capita income. Mehrara & Musai (2013) explore the linkage between gross domestic investment (INV) and GDP for Middle East and North Africa (MENA) region countries by employing the panel unit root tests and panel cointegration analysis for the time period 1970-2010.The study unfolds that robust causality runs from the economic growth to investment in the MENA region countries.

Data and Methodology

The study examines the relationship among stock market capitalization, capital formation and economic growth in the Saudi Arabia. Data is taken from World Bank and Saudi Arabian Monetary Agency (SAMA). Data cover the time period from 1985 to 2012. Capital Formation (CF) is measured by gross fixed capital formation in physical assets at purchase value at current price. Stock Market Capitalization (SMC) is measured by the market value of the shares and Economic Growth (GDP) is measured by Gross Dopmestic Product per capita.

Unit Root Tests

The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are used to verify the stationary trend in data. This study has applied unit root tests for data to observe the integrated order of variables.
The basic ADF equation for unit root is:

$$\Delta Y_t = \lambda_0 + \lambda_{1t} + \lambda_2 y_{t-1} + \sum_{i=1}^{n-1} \lambda i \Delta Y_{t-1} + e_t$$

The Equation represents variables in the form of ΔY_t in a time period t, while λ_0 is a constant term and $\Delta Y_t = Y_t - Y_{t-1}$ where t represent the trend and e_t is noise error term used in the model.

Null hypothesis and Alternative hypothesis for the above mentioned equation are:

H_0: $\lambda_2 = 0$ (data is Non Stationary)
H_1: $\lambda_2 < 0$ (data is Stationary)

The H_0 states that the data have a unit root and alternative hypothesis H_1 states that data do not have a unit root.

Phillips-Perron (PP) Test is another test to establish the integrated order of the data. This test also considers the issues of serial correlation and heteroscedasticity in the data. The equation for this test is as under:

$$\Delta Z_t = \theta Z_{t-1} + \alpha + e_t$$

Δ denotes the first difference operator in the equation.The hypothesis for PP test is same as for ADF. Tables 1 and 2 show the results of unit root tests affirming that null hypothesis of no unit root cannot be rejected at levels as the absolute values of t statistic is less than the critical values in both tests. Unlikely at first difference where the t values are more than the critical values means H_0 is rejected at the first difference. Therefore it can be established that all the variables under study are non-stationary at level and stationary at first difference.

Table 1 Adf Unit Root Test

Variables	At level				At first difference			
	With constant		With constant linear trend		ConstanT		With Costant Linear Trend	
	t-stat	C- value	t-stat	C- value	t-stat	C- Value	t-stat	C- Value
GDP	1.1714	-3.6998	-1.9686	-4.339	-5.0623	-3.7114	-4.5957	-4.3743
SMC	-.8929	-3.6998	-2.3926	-4.339	-6.157	-3.7114	-6.0393	-4.3743
CF	0.0809	-3.6998	-1.7919	-4.339	-4.285	-3.7114	-4.41	-4.3743

Table 2 PP Unit Root Test

Variables	At level				At first difference			
	With Constant		With Constant and Linear Trend		With Constant		With Constant and Linear Trend	
	t-stat	C- Value	t-stat	C- Value	t-stat	C- Value	t-stat	C- Value
GDP	2.1037	-3.6998	-2.009	-4.339	-5.2216	-3.7114	-6.551	-4.3743
SMC	-0.854	-3.6998	-2.528	-4.339	-6.134	-3.7114	-6.018	-4.3743
CF	.8804	-3.6998	-2.375	-4.339	-4.316	-3.7114	-4.45	-4.3743

Johansen Test for Co-integration

After resolving the issue of unit root, the co-integration test can be useful in order to judge the long run relationship among the variables. The co-integration theory states that although the variables in a model are non-stationary at levels but the linear relationship among them may still be stationary at difference. This study has applied multivariate co-integration approach which was developed by Johansen and Juselius (1990) to establish the long –run relationship among the variables under consideration. Table 3 below shows the results of Johansen co-integration test. It is evident from the results, that there is no co-integrated equation which implies the absence of any long run relationship among the variables. Trace test and Max-Eigen values are less than the critical values and respective p- values are also insignificant which asserts that Vector Error Correction Model (VECM) is not applicable in this specific case and suggest the use VAR model for further analysis.

Table 3 Johansen co-integration test

Unrestricted Cointegration Rank Test (Trace)					Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized					Hypothesized				
No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**	No. of CE(s)	Eigenvalue	Max-eigen Statistic	.005 Critical Value	Prob.**
None	0.507184	27.60082	29.79707	0.0878	None	0.507184	18.39809	21.13162	0.1157
At most 1	0.280288	9.202724	15.49471	0.3470	At most 1	0.280288	8.551524	14.26460	0.3254
At most 2	0.024735	0.651201	3.841466	0.4197	At most 2	0.024735	0.651201	3.841466	0.4197

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 Vector Auto-regression (VAR) Model

Vector auto regression (VAR) is used to recognize the linear relationships for variables with multiple time series. The VAR model treats all variables as endogenous variables that mean a separate equation is generated for each variable. Each equation contains lagged values of all the variables as independent variables with the dependent variable itself. The basic equations used for VAR are given below:

$$GDP_{t,1} = \alpha_1 + \varphi_{11}GDP_{t-1,1} + \varphi_{12}SMC_{t-1,2} + \varphi_{13}CF_{t-1,3} + w_{t,1}$$
$$SMC_{t,2} = \alpha_2 + \varphi_{21}GDP_{t-1,1} + \varphi_{22}SMC_{t-1,2} + \varphi_{23}CF_{t-1,3} + w_{t,2}$$
$$CF_{t,3} = \alpha_3 + \varphi_{31}GDP_{-1,1} + \varphi_{32}SMC_{t-1,2} + \varphi_{33}CF_{t-1,3} + w_{t,3}$$

Table 4 represents the results of VAR in which it can be examined that there are some significant values of coefficients which suggest that there may exist relationship among the variables. The value of coefficients of GDP with lag does not significantly affect GDP and economic growth, and the value of intercept in the equation is not significant as well. While stock market capitalization represented by SMC has a significant

effect on economic growth and capital formation represented by CF has no significance as well .If stock market capitalization is taken as a dependent variable the lagged GDP, Capital formation and stock market capitalization does not have significant coefficient values. When capital formation is considered as dependent variable, the coefficients of GDP and CF are not significant and SMC have significant effect on the it.

Following are the equations with the values of the related coefficients:
GDP = 0.506874*GDP (-1) + 0.105130*SMC (-1) + 0.153915*CF (-1) +2.061083
SMC = -0.081318*GDP (-1) + 0.909793*SMC (-1) + 0.092174*CF (-1) + 1.008659
CF = 0.283486*GDP (-1) 0.198307*SMC (-1) + 0.634862*CF (-1) -1.054973

Table 4 Vector Autoregression Estimates

	GDP	SMC	CF
GDP(-1)	0.506874	-0.081318	0.283486
	(0.23570)	(0.93362)	(0.28439)
	[2.15050]	[-0.08710]	[0.99682]
SMC(-1)	0.105130	0.909793	0.198307
	(0.04229)	(0.16752)	(0.05103)
	[2.48582]	[5.43098]	[3.88623]
CF(-1)	0.153915	0.092174	0.634862
	(0.13347)	(0.52870)	(0.16105)
	[1.15314]	[0.17434]	[3.94210]
C	2.061083	1.008659	-1.054973
	(1.11163)	(4.40321)	(1.34126)
	[1.85410]	[0.22907]	[-0.78655]
R-squared	0.956977	0.895467	0.982026
Adj. R-squared	0.951366	0.881832	0.979681
F-statistic	170.5345	65.67521	418.8637

The Selection of Lag Length

The outcomes of different lag length selection criteria that are stated in the table 5 shows that the optimal lag order for this model is one which is suggested by all of the selection methods.

Table 5

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-19.08741	NA	0.001098	1.699031	1.844196	1.740833
1	45.06987	108.5738*	1.59e-05*	-2.543836*	-1.963176*	-2.376627*
2	51.04791	8.737145	2.07e-05	-2.311378	-1.295223	-2.018762

* 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

Granger Causality Test

VAR can not ascertain the direction of causality so the study has utilized granger causality to identify the causal relationship between the variables. Granger Causality test can be described as under , if variables under consideration are incorporated.

$$GDP_t = \alpha_0 + \sum_{i=1}^{m} \alpha_{1i} GDP_{t-i} + \sum_{i=1}^{n} \alpha_{2i} SMC_{t-i} + \sum_{i=1}^{n} \alpha_{3i} CF_{t-i} + \alpha_4 ECT_{t-1} + \emptyset_t$$

$$SMC_t = \beta_0 + \sum_{i=1}^{m} \beta_{1i} GDP_{t-i} + \sum_{i=1}^{n} \beta_{2i} SMC_{t-i} + \sum_{i=1}^{n} \alpha_{3i} CF_{t-i} + \beta_4 ECT_{t-1} + \theta_t$$

$$CF_t = \psi_0 + \sum_{i=1}^{m} \psi_{1i} GDP_{t-i} + \sum_{i=1}^{n} \psi_{2i} SMC_{t-i} + \sum_{i=1}^{n} \psi_{3i} CF_{t-i} + \psi_4 ECT_{t-1} + \pi_t$$

Where ECT_{t-1} is error correction term at lag order one and $\emptyset$, θ and π are white noise residual and $\alpha_0, \beta_0, \psi_0$ are the intercepts in the above model.

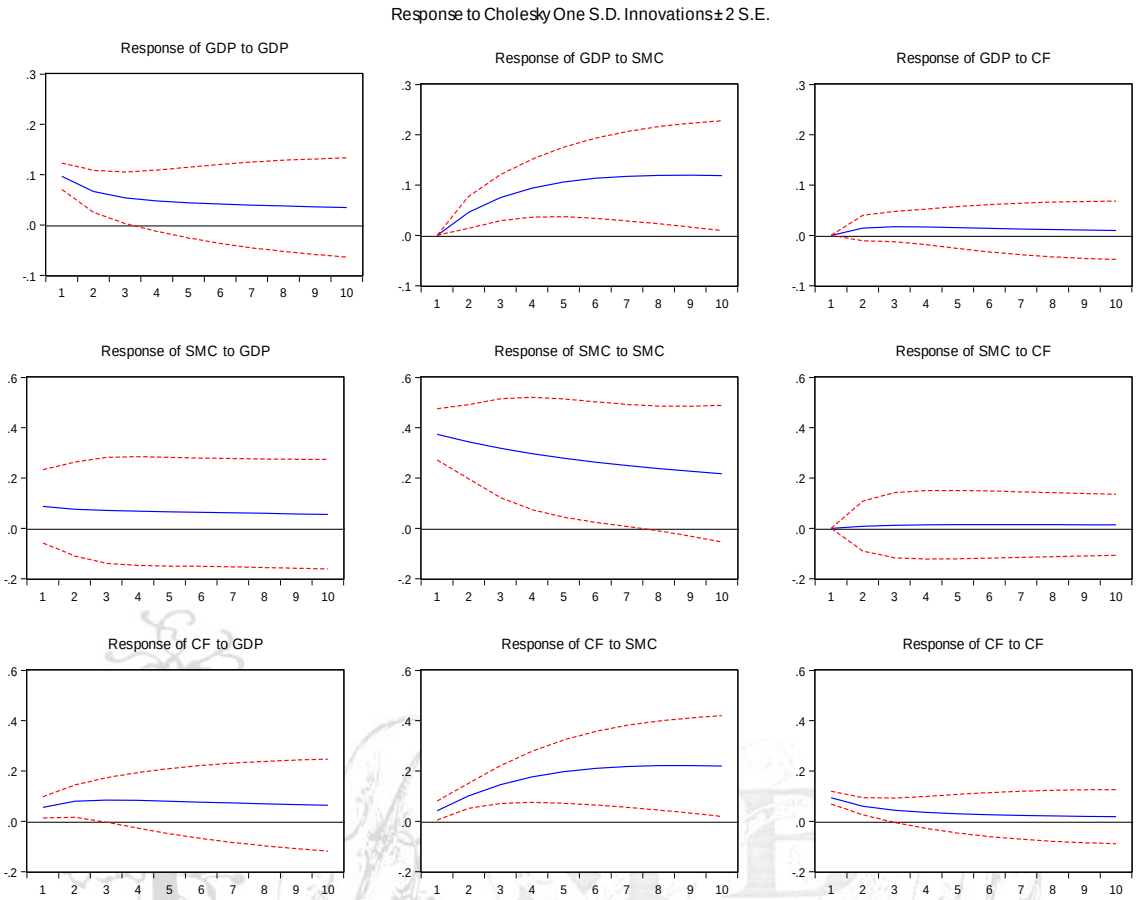
Table 6 shows Granger causality test, which reveals three causal relationships .The stock market capitalization causes economic growth where direction is from SMC to GDP at 5% level of significance. This is also suggested for capital formation and economic growth where the direction is from CF to GDP. Stock market capitalization also cause capital formation, the direction is from SMC to CF.

Table 6

Null Hypothesis:	Obs	F-Statistic	Prob.
SMC does not Granger Cause GDP	27	10.6628	0.0033
GDP does not Granger Cause SMC		0.02304	0.8806
CF does not Granger Cause GDP	27	4.90194	0.0366
GDP does not Granger Cause CF		0.59160	0.4493
CF does not Granger Cause SMC	27	0.04686	0.8305
SMC does not Granger Cause CF		15.0523	0.0007

The Impulse Response Function

Impulse response function is used to determine the impact of shocks to the variables which demonstrates the effect of these shocks to one on current and future values of all the endogenous variables. This study has used the 3x3 graphs to depict the results of impulse response on each variable.By looking at the graphs, one can ascertain the response of economic growth to shocks to the other variables under consideration. The response is positive and negative at times with consistent increasing and decreasing rate. The effect of shock for stock market capitalization to itself is diminishing while it is stable for capital formation and economic growth. For a shock to capital formation, the response to itself and GDP is relatively stable while it's increasing for stock market capitalization.



Variance Decomposition Method

Variance decomposition method is another appropriate technique in order to explain the system dynamics. This specific method decomposes the variation in a variable into the component shocks in relation to other variables under consideration. It provides the information about specific random innovations to the variables in the model.

Tables 7, 8 & 9 Variance decomposition of GDP, SMC and CF GDP

Period	S.E.	GDP	SMC	CF
1	0.096834	100.0000	0.000000	0.000000
2	0.127000	85.70595	12.99586	1.298184
3	0.157999	67.08494	30.85903	2.056027
4	0.190625	52.40504	45.40139	2.193574
5	0.223056	42.21160	55.71049	2.077907
6	0.254054	35.22778	62.87144	1.900785
7	0.283012	30.34169	67.92866	1.729651
8	0.309705	26.82252	71.59500	1.582476
9	0.334123	24.21424	74.32509	1.460678
10	0.356365	22.23057	76.40846	1.360977

SMC Period	S.E.	GDP	SMC	CF
1	0.383563	5.132912	94.86709	0.000000
2	0.520768	4.928655	95.04366	0.027689
3	0.614638	4.883505	95.05716	0.059332
4	0.686146	4.908279	95.00413	0.087586
5	0.743686	4.962608	94.92561	0.111780
6	0.791602	5.027395	94.84017	0.132433
7	0.832459	5.093509	94.75634	0.150150
8	0.867900	5.156687	94.67788	0.165430
9	0.899039	5.215104	94.60623	0.178670
10	0.926669	5.268161	94.54165	0.190188

CF S.E.		GDP	SMC	CF
1	0.116837	22.15684	13.09637	64.74679
2	0.183673	27.74679	35.49440	36.75880
3	0.252763	25.84343	51.75561	22.40096
4	0.321262	22.69643	62.24222	15.06135
5	0.386668	19.93823	69.07128	10.99049
6	0.447698	17.78041	73.68091	8.538674
7	0.503868	16.13071	76.91247	6.956819
8	0.555149	14.86526	79.25650	5.878236
9	0.601752	13.88306	81.00749	5.109452
10	0.644005	13.10988	82.34867	4.541445

From the result of variance decomposition tables above, it can be seen that that about 74 per cent of GDP can be explained by the effects of stock market capitalization and it is about 1.3 per cent for capital formation. While 5.2 per cent of the stock market capitalization can be explained by the variations in GDP and it is only 0.19 per cent with respect to effect of capital formation. Capital formation is determined up to 13 per cent by the effects of GDP and it is 82 per cent in the case of stock market capitalization.

Conclusion

The study examines the relationship among stock market capitalization, capital formation and economic growth in the Saudi Arabia. Data is taken from World Bank and Saudi Arabian Monetary Agency (SAMA) The outcome of Johansen co-integration depicts that the study cannot establish any long term relationship among the variables.Vector Autoregressive Model is applied to examine the further relationships. The result reveals the existence of relationship between economic growth and stock market capitalization. The stock market capitalization causes economic growth where direction is from SMC to GDP at 5% level of significance which establishes that stock market capitalization causes economic growth in the Kingdom of Saudi Arabia. This is also true for capital formation and economic growth where the capital formation causes the economic growth. Stock market capitalization also causes capital formation and its direction is from SMC to CF.The study also used the impulse response function and variance decompositions to determine the impact of shocks on the variables in the model. The results reveal about 74 per cent of GDP can be explained by the effects of stock market capitalization and it is about 1.3 per cent for capital formation.While 5.2 per cent of the stock market capitalization can be explained by the variations in GDP and it is only 0.19 per cent with respect to effect of capital formation. Capital formation is determined up to 13 per cent by the effects of GDP and it is 82 per cent in the case of stock market capitalization. The policy

implication that could be taken in consideration from the result of the purported study is the further development of the stock market.The kingdom should unfold more suitable framework for the Saudi stock market so as to enhance the pace of economic growth and capital formation.Agreements with the regional stock markets shall provide the cross–listings.Further,higher level of space in term of investment in the Saudi stock market for the foreign investors shall bring lead to more invesmtnent flows.

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