Financial Development and Economic Growth in Developing Countries: Evidence from Saudi Arabia

FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN DEVELOPING COUNTRIES: EVIDENCE FROM SAUDI ARABIA

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Abstract

This study investigates the long-term and short-term relationships between capital market development and economic growth in the Kingdom of Saudi Arabia (KSA) for the period from January 1993 to December 2009. It employs a wide range of vector autoregression (VAR) models to evaluate the importance and impact of capital market development on economic growth.

We used real GDP growth rates and None Oil GDP as proxies for economic growth and the stock market index (SMI), the bank credits to the private sector (BCP) and the broad money supply (M2) as proxies for the capital market development.

The VAR models indicate a positive and significant long-term causal relationship between capital market development and economic growth. Granger causality tests show that economic growth Granger-cause capital market development and vice versa when using the real GDP growth rate variables.

The study implications are as follows. Firstly, investment in real economic activities leads to economic growth. Secondly, the stock market might hinder economic growth due to its volatile and international risk sharing nature, low free-floating share ratio, number of listed companies and the domination of Saudi Individual Stock Trades (SIST) characteristics. Thirdly, policymakers should seek to minimise stock market volatility and fluctuations, increase both the free-floating share ratio and number of listed companies and shift investment domination toward corporate investors by considering its effect on economic growth when formulating economic policies. Fourthly, the banking sector might hinder economic growth due to its lack of small and medium enterprises lending and shareholder concentration issues. Finally, policymakers should seek to encourage banks toward more involvement in small and medium enterprises SMEs' lending, which will strengthen the private sector role.

Keywords: Saudi Arabia, Capital Market Development, Economic Growth, VAR Model, Cointrgration, Granger Causality

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1 Introduction

Economic development and growth issues continue to capture the interests of academics and policy makers around the globe. In recent times, the shift in emphasis has been from the classical concepts of maximising production outputs and wealth distribution towards economic sustainability, as a reaction to globalisation. This has resulted in major economic reforms, especially among developing countries as they expand their markets. Economic sustainability is heavily tied to investment, which in turn relies on the capital market. Hence, development of a stable domestic capital market underpins sustainability. Within the capital market, development of the equity and debt markets is an important part of any economic reform. Securities trading is the dominant financial market function that mobilises saving, allocates capital, exerts corporate control and eases financial risks (Levine & Zervos 1996, 1998).

As a developing economy and a member of the Group of Twenty (G-20), Saudi Arabia is not an exception in this international trend. In the last three Five-Year Saudi National Development Plans (2000–2014), major legal, economic and financial reforms were implemented to promote sustainable economic growth. Such reforms were made to diversify the oil-based economy towards greater sustainability in line with international economic practices (Ramady 2010).

Although industrialisation is relatively recent in Saudi Arabia, it has witnessed a steady development with distinguished accomplishments that are attributed to the industrial sector and the support it receives from the government owing to its important role in achieving strategic and economic goals of the country. The government's support has covered several spheres, including implementation of required infrastructure, construction of Jubail and

Yanbu industrial cities, construction of industrial cities in various regions of KSA, establishment of the Saudi Industrial Development Fund (SIDF), and continued provision of other industrial support and incentives. The private sector's response to and cooperation with the governmental plans and efforts have had an effect on the actualisation of industrial development.

In addition to the Saudi intention to move the country's income from non-renewable resources, the conservative Islamic investment environment in Saudi prohibit usury-interest on loans, which means a bigger emphasis on raising capital through capital markets, such as initial public offerings (IPOs) and *sukuk*s (Islamic bonds) than bank loans (Al-Bqami 2000).

To date, these reforms have not been replicated in securities exchange practices; further, there are no adequate capital market development and economic growth relationship studies to provide guidance for decision makers in the anticipated transformation. This research attempts to fill this empirical gap.

The aim of the research is to determine the relationship between capital market development and economic growth in Saudi Arabia. Such study on the capital market developments become because Saudi Arabia is moving aggressively toward strengthening the private sector role in the economy via privatisation, establishment of the Capital Market Authority (CMA) in 2003, and the creation of the new seven economic cities.

The academic benefits of this research are; first, this research will fill the significant gap in the literature on the Saudi capital market and its relationship to economic growth; second, this research will offer updated findings on the relationship between Saudi capital market development and economic growth, as the extant empirical data predates the radical changes in the capital market in 2003.

In addition, the practical benefits of this research is to provide contemporary information on the Saudi economy as a whole and the capital market, particularly for Saudi decision makers, academics and the industry.

2. Financial Market Developments and Economic Growth

2.1 Capital market

The capital markets can be defined as a market that specialises in offering long run loans to the economy (Gurusamy 2009); It is also part of the financial system that is responsible for channelling funds from surplus to deficit areas of the economy (Levine & Zervos 1998); Capital markets are the act of financial intermediary institutions that facilitate capital formation, mobilisation and channelling of capital funds on long term basis to investors across the economy (Obiakor & Okwu 2011). In addition, capital markets combine markets and institutions that specialise in the issuance as well as the trading of financial instruments in the long run. Thus, for this study we follow the views of Obiakor and Okwu (2011) and Gurusamy (2009) on the capital market as an institutional arrangement involving efficiently mobilising and channelling long run financial resources through a set of financial services that could affect economic growth. Moreover, capital market development can be defined as the capital market capability at low cost to acquire information, enforce contracts, facilitate transactions and create incentives for the emergence of particular types of financial contracts, markets and intermediaries (Levine & Zervos 1998, Obiakor & Okwu 2011). Furthermore, Randall Dodd offered an extended definition of capital markets:

A more complete view of capital markets is, by analogy, a four-legged table made up of securities markets (issuing and trading bonds and equity shares), banking industry (issuing loans and providing payment and settlement services), insurance and pension funds (providing future income and collateral for lending), and derivatives markets (risk management and price discovery). All four legs serve to support the table, and it is no more stable than its weakest leg. (Ocampo & Stiglitz 2008:290)

Note, the terms "capital market development", "financial development", "financial intermediation" are used interchangeably in this study. Capital market development, however, should be thought of as a broader concept that also includes financial innovations that occur outside the banking system. Because of the lack of data regarding non-bank financial innovation in developing countries like Saudi Arabia, the level of financial intermediation effectively measures the degree of capital market development by the banking system. For a comprehensive survey of recent evidence see Levine (1997).

2.2 Economic Growth

Economic growth can be quantitatively defined as an increase in real gross domestic product (GDP). Many factors could affect economic growth, for example these include investment ratio (Pagano 1993, Greenwood & Jovanovic 1990), human capital (Romer 1986), research and development (Solow 1956, Darrat & Al-Sowaidi 2010). Economic development and growth issues continue to capture the interests of academics and policy makers around the globe. In recent times, the shift in emphasis has been from the classical concepts of maximising production outputs and wealth distribution towards economic sustainability, as a reaction to globalisation. This has resulted in major economic reforms, especially among developing countries as they expand their markets. Economic sustainability is heavily tied to investment, which in turn relies on the capital

market. Hence, development of a stable domestic capital market underpins sustainability (Levine & Zervos 1998).

2.3 Capital Market Development & Economic Growth Main Hypotheses (Views)

According to modern growth theory, the financial sector may affect long-run growth through its impact on capital accumulation and the rate of technological progress. Financial sector development has a crucial impact on economic growth and poverty reduction, especially in developing countries; without it, economic development may be constrained, even if other necessary conditions are met (DFID 2004).

The theoretical relationships between capital market development and economic growth have been analysed extensively in the literature and may be summarised under four hypotheses or views:

First, the conventional view of the supply leading hypothesis postulates that the direction of causality flows from capital market development to steady-state economic growth. In a world without frictions caused by transaction, information, and monitoring costs, no financial intermediaries are needed. If those costs are sufficiently high, no exchanges among economic agents will take place. The need to reduce those costs for exchanges to take place has led to the emergence of financial institutions and markets constituting the financial sector. A well-developed financial sector provides critical services to reduce those costs and thus to increase the efficiency of intermediation. It mobilises savings, identifies and funds good business projects, monitors the performance of managers, facilitates trading, diversification of risks, and fosters exchange of goods and services. These services result in a more efficient allocation of resources, a more rapid accumulation of physical and human capital, and faster technological innovation, thus inducing faster long-term economic growth.

This view can be traced back to Schumpeter (1912), Goldsmith (1969), McKinnon (1973), Shaw (1973) King and Levine (1993) and Pagano (1993) all of whom investigated the effect of capital market development on economic growth (Demirhan, Aydemir & Inkaya 2011; Levine & Zervos 1998). Schumpeter's (1912) important early study proposed a causal link whereby capital markets promote economic growth by funding entrepreneurs and channelling capital to them with higher return investments (Ake & Ognaligui 2010; Demirhan, Aydemir & Inkaya 2011; Dritsaki & Dritsaki-Bargiota 2005; Levine & Zervos 1998). Schumpeter's (1912) view was that economic change could not simply be predicated on previous economic conditions alone, although prevailing economic conditions were a result of this. Similarly, Goldsmith (1969) emphasised the effect of the financial structure and development on economic growth.

Second, the demand following hypothesis proposes that economic growth leads to capital market development (Jung 1986). This view suggests that as the economy grows, more financial institutions, financial products and services emerge in markets in response to a higher demand for financial services (Zang & Chul Kim 2007, Athanasios & Antonios 2010, Odhiambo 2010, Obiakor & Okwu 2011). If this hypothesis is correct, reform efforts should sequentially emphasise the development of the real sector, such as privatisation, labour market reforms to increase employment, tax reforms to provide a level playing field for investment, or legal and regulatory reforms to encourage private sector development.

The third view is the 'Feedback' causality that exists when there are a bi-directional causality between capital market development and economic growth (Hondroyiannis, Lolos and Papapetrou 2005, Majid 2007, Demirhan, Aydemir & Inkaya 2011, Al-Malkawi, Marashdeh & Abdullah 2012). A country with a well-developed capital market could promote high economic expansion through technological changes, products and services innovation, which in turn creates a high demand for the financial institutions. As the financial institutions effectively respond to this demand, these changes will stimulate higher economic achievement. Both capital market and economic developments are therefore positively interdependent (Majid 2007).

The fourth view is the 'Independent' causality that capital market and economic growth is not causally related (Stiglitz 1985, Mayer 1988, Boyd & Smith 1998, Mosesov & Sahawneh 2005, Abu-Bader & Abu-Qarn 2006). Large and well-developed capital markets are insignificant sources of corporate finance (Mayer 1988). Capital market liquidity will not enhance incentives for acquiring information about firms or exerting corporate governance (Stiglitz 1985, 1993). Risk sharing through internationally integrated capital markets can actually reduce saving rates and slow economic growth (Devereux & Smith 1994). Capital market development can harm economic growth by easing counter-productive corporate takeovers (Morck, Shleifer & Vishny 1990a, 1990b; Shleifer & Summers 1988).

2.4 Capital Market Development & Economic Growth Empirics

The literature review shows that the debate continues in both theoretical and empirical studies regarding the importance and causality directions of the relationship between capital market development and economic growth. For example, there are similar inconsistencies in empirical data on Saudi Arabia: on one hand Darrat (1999) investigated empirically the relationship between financial deepening and economic growth for three developing Middle-Eastern countries (Saudi

Arabia, Turkey and the UAE). His empirical results suggested that the economic stimulus of more sophisticated and efficient financial markets in Saudi Arabia become noticeable only gradually as the economies grow and mature in the long-run, and financial deepening may influence only some, but not all, sectors of the economy. On the other hand Naceur and Ghazouani's (2007) analysis of data from 1991 to 2003 found that developing the capital market is not important to the economies in 11 Middle Eastern and North African (MENA) countries, including Saudi Arabia. This resulted to their underdeveloped financial systems and unstable growth rates.

The objective of this chapter is to provide policy makers, academics and both profit and non-profit organisations, who desire to undertake research in the field or learn more about it, with an idea of the theoretical and empirical relationship between capital market development and economic growth as proposed by key economists in the field. Therefore it is important to determine how the capital market and the economy are correlated. Other objective is to offer a review of the relevant empirical research regarding capital market development and economic growth. It is essential to review the empirical literature, because this will assist academics and the research community to choose most appropriate data and methodologies when investigating the significance of and relationship between capital market development and economic growth. It could also help policy makers to decide which policy is best for the economy or, in other words, to determine what advantages they might acquire in terms of economic growth if they direct their policy toward developing the capital market. An empirical literature review also provides insights on the inconsistent results regarding capital market development and economic growth in the case of Saudi Arabia.

There is evidence of a direct relationship between capital market development and economic growth. Large capital markets can lower the cost of mobilising saving and thereby facilitate investment in productive technologies (Greenwood & Smith 1997). Bencivenga, Smith and Starr (1996) and Levine (1991) find that capital market liquidity is important for growth. Efficient capital markets may increase investment through enhancing the flow of information on firms, which also improves corporate governance (Holmstrom & Tirole 1993; Kyle 1984). International risk sharing through internationally integrated stock markets improves resource allocation and increases the economic growth rate (Obstfeld 1994).

There is also country-specific evidence of a strong relationship between capital market development and economic growth (Ghali 1999). Hondroyiannis, Lolos and Papapetrou (2005) used monthly data sets over the 1986–1999 period to empirically assess how the development of the banking system and the stock market relates to economic performance in Greece. They used vector autoregression (VAR) models and showed that there was bidirectional causality between capital market development and economic growth in the long run. Error-correction models show that capital market promote economic growth in the long run: for example, Ghali's (1999) study on Tunisia, Khan Qayyum and Sheikh's (2005) study on Pakistan and Agrawalla and Tuteja's (2007) study on India.

However, large and well-developed capital markets are insignificant sources of corporate finance (Mayer 1988). Capital market liquidity will not enhance incentives for acquiring information about firms or exerting corporate governance (Stiglitz 1985, 1993). Risk sharing through internationally integrated capital markets can actually reduce saving rates and slow economic growth (Devereux & Smith 1994). Capital market development can harm economic growth by easing counter-productive corporate takeovers (Morck, Shleifer & Vishny 1990a, 1990b; Shleifer & Summers 1988).

Demirhan, Aydemir and Inkaya (2011) resolved previous inconsistencies in empirical data on Turkey by providing evidence of bidirectional causality between capital market development and economic growth. There are similar inconsistencies in empirical data on Saudi Arabia: on one hand Darrat (1999) investigated empirically the relationship between financial deepening and economic growth for three developing Middle-Eastern countries (Saudi Arabia, Turkey and the UAE). His empirical results suggested that the economic stimulus of more sophisticated and efficient financial markets in Saudi Arabia become noticeable only gradually as the economies grow and mature in the long-run, and financial deepening may influence only some, but not all, sectors of the economy. On the other hand Naceur and Ghazouani's (2007) analysis of data from 1991 to 2003 found that developing financial structures is not as important to the economies in 11 Middle Eastern and North African (MENA) countries, including Saudi Arabia, due to their underdeveloped financial systems and unstable growth rates. Thus, there appears to be no existing research on the proposed topic of this study.

The empirical literature in the case of Saudi Arabia with the exception of Masih et. al. (2009) is limited to MENA and GCC regions. These cross-country specific studies led to diverse results (Darrat 1999, Xu 2000, Al-Tamimi et al., 2002, Al-Yousif 2002, Omran and Bolbol 2003, Boulila & Trabelsi, 2004, Chuah & Thai 2004, Al-Awad & Harb, 2005, Naceur & Ghazouani 2007, Masih et. al. 2009, Goaied et. al. 2011, Kar et. al. 2011). These studies shared the lack of a capital market variables that fully reflect the banking sector and the stock market. Also these empirics used annual data that both old and short with low frequencies as low as 20 observations. These noticeable remarks motivated this study on Saudi Arabia to be country-specific, using long time period, and more frequent and updated data.

Some empirics indicated a significant long run

relationship in the capital market-economic growth nexus. Al-Tamimi et. al. (2002) examined the relationship between financial development and economic growth by using VAR method for Arab countries including Saudi Arabia over the period 1964-1998. The results indicate that capital market development and real GDP growth are strongly linked in the long-run. However, Granger causality tests and the impulse response functions indicate that the linkage is weak in the short-run. In addition, Xu (2000) used a multivariate vector-autoregressive (VAR) method to examine the effects of capital market development on domestic investment and output in 41 countries over the period 1960-1993. The findings support the supply leading view. However, a negative long term relationship between financial development and economic growth is found in the case of Saudi Arabia using data from 1962-1992.

In addition, couple of empirics supports the independent view: Boulila and Trabelsi (2004) used a sample of sixteen MENA countries for the period 1960–2002. They applied the bivariate vector autoregressive (bVAR) model on these variables: Real GDP per capita. Ratio of M3 to GDP, ratio of credit allocated to the private sector, ratio of financial savings to GDP. Ratio of M3 to GDP, ratio of credit allocated to the private sector, ratio of financial savings to GDP. They found no link between capital market development and economic growth in the case of Saudi Arabia over the period 1960-1999. Similar results of no significant relationship between capital market development and growth is found in the study of Naceur and Ghazouani (2007) that applied a dynamic panel model with GMM estimators on the data of 11 MENA countries, hence data on Saudi Arabia for the period 1991-2003.

Moreover, empirics that support the supply leading view do exist. Omran and Bolbol (2003) construct a growth equation that captures the interaction between FDI and various indicators of capital market development in the context of Arab countries. They used averaged five years cross-sectional data for the period 1975–1999. The estimation model is based on the growth accounting framework of the Cobb-Douglas production function where y is the growth rate of GDP per capita in the Arab world, and x represents capital market development indicators of the banking sector and the stock market. z is a vector of control variables that are usually used in the estimation (initial per capita income, human capital, investment/GDP, inflation rate, government consumption/GDP, openness of trade/GDP, and exchange rate), and is the error term. They found that FDI has a positive impact on economic growth, which depends on local conditions and absorptive capacities, where capital market development is one of the important capacities.

Likewise, empirics within the MENA region of Al-Awad and Harb (2005) who used a sample of ten MENA countries for the period 1969–2000 and by using panel cointegration approach concluded that the long-run capital market development and economic growth may be related to some level. In addition, the evidence of unidirectional causality that runs from capital market development to economic growth can be seen in Saudi Arabia in the short-run. However, Kar et. al. (2011) researched a sample of fifteen MENA countries over the period 1980–2007. They used GMM method and found a unidirectional relationship runs from economic growth to capital market development when using the ratio of private sector credit to income as a proxy for capital market development. Different results were found using a similar GMM method, Goaied et. al. (2011) investigated 16 MENA countries using annual data over the period 1962-2006. They found a negative and signification relationship in the long run when using bank based variables.

A recent country-specific study on Saudi Arabia concluded a supply leading view done by Masih et. al. (2009). They examined the relationship between capital market development and economic growth by applying VAR method and using annual data from 1985-2004 (20 observations). Note, they only used banking based measurement as proxies for the capital market development variable.

Furthermore, bidirectional relationship was found in the early study of Darrat (1999) who investigated the relationship between financial deepening and economic growth for three developing Middle-Eastern countries (Saudi Arabia, Turkey and the UAE). He applied Granger-Causality tests and VAR method over the period of 1964-1993 for Saudi Arabia. The study found long run bidirectional relationship between financial deepening and economic growth in the case of Saudi Arabia. Likewise, Al-Yousif (2002) examined the nature and direction of the relationship between financial development and economic growth employing a Granger-causality test within a VECM method. He used both time-series and panel data from 30 developing countries including Saudi Arabia for the period 1970-1999. The study found bidirectional causality between capital market development and economic growth. Similar results found by Chuah and Thai (2004), they used real non-hydrocarbon GDP in order to capture the real impact of bank based development variables on economic growth for six GCC countries including Saudi Arabia. Chuah and Thai (2004) used annual data over the period 1962-1999 for Saudi Arabia. They applied a bivariate time series model and concluded that capital market development provides critical services to increase the efficiency of intermediation, leading to a more efficient allocation of resources, a more rapid accumulation of physical and human capital, and faster technological innovation.

Table 2.1. Empirics Included Saudi Arabia

Author(s)	Empirical study	Sample	Period	Method	Results
Darrat (1999)	Are financial deepening and economic growth causality related? Another look at the evidence	Saudi Arabia, Turkey & UAE,	1964-93	Granger-Causality tests within VAR model	Feedback view
Xu (2000)	Financial development, investment, and economic growth	41 Countries	1960-93	VAR	Supply-leading view, a negative long term relationship
Al-Tamimi et. al. (2002)	Finance and Growth: Evidence from Some Arab Countries	8 Arab countries	1964-98	VAR	Positive and signification relationship in the long run when using bank based variables
Omran & Bolbol (2003)	Foreign direct investment, financial development, and economic growth: evidence from the Arab countries	17Arab countries	1975-99	OLS & Causality tests	Supply-leading view
Al-Awad & Harb (2005)	Financial development and economic growth in the Middle East	10 MENA countries	1969-2000	J-J & Granger panel cointegration tests	Supply-leading view in short term
Chuah & Thai (2004)	Financial Development and Economic Growth: Evidence from Causality Tests for the GCC countries	6 GCC countries	1962-1999	bVAR	Supply-leading view
Goaied et. al. (2011)	Financial Development, Islamic Banking and Economic Growth Evidence from MENA Region	16 MENA countries	1962-2006	GMM	Negative and signification relationship in the long run when using bank based variables
Kar et. al. (2011)	Financial development and economic growth nexus in the MENA countries: Bootstrap panel granger causality analysis	15 MENA countries	1980-2007	GMM	Demand-following view
Al-Yousif (2002)	Financial development and economic growth: another look at the evidence from developing countries	30 Developing countries	1970-99	VECM	Feedback view
Boulila & Trabelsi (2004)	The Causality Issue in the Finance and Growth Nexus: Empirical Evidence from Middle East and North African Countries	16 MENA countries	1960–2002	bVAR	Independent view
Naceur and Ghazouani (2007)	Stock markets, banks, and economic growth: empirical evidence from the MENA region	11 MENA countries	1991-2003	GMM	Independent view
Masih et. al. (2009)	Causality between financial development and economic growth: an application of vector error correction and variance decomposition methods to Saudi Arabia	Saudi Arabia	1985-2004	VAR	Supply-leading view

3 Data, Scope and Variables

This study investigates the relationship between capital market development and economic growth of the Saudi economy over the period January 1993 to December 2009. The secondary monthly data (204 observations) of the variables selected for the VAR models are collected from the IMF, SAMA and the Saudi stock exchange Tadawul.

We used real GDP growth rate (GDP) and real non-oil GDP growth rate (NOGDP) as proxies for economic growth; Stock market development (SMI)

proxied by the Tadawul All share index (TASI), the broad money supply (M2) and bank credit (BCP) of local commercial banks for the private sector as proxies for capital market development. Controlled by (1) a short term interest rate (IR), the Saudi Arabia Interbank Offered Rate (Isa3); (2) inflation (INF) in the Saudi economy measured by the consumer price index (CPI);

(3) world oil price (OP) proxied by the UK-Brent crude price oil.

3.1 Economic Growth Variables

Economic growth in Saudi Arabia has been based, to a large extent, on the development of hydrocarbon (oil and gas) resources. The production of hydrocarbon sector, while having met world demand, has also been conditioned by the need to finance domestic development. To a more limited extent, economic growth has also reflected the development of non-hydrocarbon sector in response to the economic diversification policy initiated in the late1970s aiming at minimising the negative effects of international oil price fluctuations. The development of the non-hydrocarbon sector is based mostly on the development of industries using the abundant hydrocarbon resources as inputs, such as petrochemicals, fertilisers, electricity generation for aluminium production. It has also been derived from growth in industries that are not based on hydrocarbon and that are important in specific countries. To measure economic growth in Saudi Arabia, we use two proxies.

3.1.1 Real GDP Growth Rates (GDP)

Economic growth is defined as the increase in a nation's ability to produce goods and services over time as is shown by increased production levels in the economy. This thesis employs real GDP growth rates as a proxy for economic growth as it focuses on actual domestic production per person, which has a bearing on the general welfare of a country's citizens. Following the empirical study of King and Levine (1993), the variable of economic growth (GDP) is measured by the rate of change of real GDP. Due to the unavailability of monthly data for GDP in Saudi Arabia, monthly figures are obtained from annual data through geometric interpolation, following Darrat and Al-Sowaidi's (2010) empirical study.

3.1.2 Real Non-Oil GDP Growth Rate (NOGDP)

The proxy for economic growth refers to real non-oil GDP growth rate. A distinguishing feature of the oil exporting countries such as Saudi Arabia is the substantial contribution of the oil sectors to the overall economy. This sector averages 60 per cent of the Saudi total economy. While financial intermediation affects all sectors of the economy, it may be argued that the performance of the oil sector reflects more global economic conditions than domestic capital market development. Therefore, total GDP may not accurately capture the impact of capital market development on economic performance. To address this concern, the oil sector of the economy is removed from GDP to form the non-oil GDP growth rate proxy (Chuah & Thai 2004).

The testing of this relationship with non-oil GDP growth rate is an attempt to see, in a broad perspective, whether capital market development may be seen as a way to meet the policy challenge facing Saudi Arabia to diversify its economy into non-oil sectors so as to reduce their vulnerabilities to international oil price fluctuations. Due to the unavailability of monthly data for GDP in Saudi Arabia, monthly figures are obtained from annual data through geometric interpolation, following Darrat and Al-Sowaidi's (2010) empirical study.

3.2 Capital Market Development (CMD) Variables

The nonfinancial sector is less developed than the banking sector. Therefore, this study is not using the following stock market related variables used in the literature review.

3.2.1 Stock Market Index (SMI)

The All-Share Index and the number of listed companies have a positive significant effect on economic growth (Asiegbu & Akujuobi 2010, Athanasios & Antonios 2010). This is supported by Olweny and Kimani's (2011) findings that imply that the causality between economic growth and the stock market runs unilaterally from the NSE 20-share index to the GDP. From their results, it was inferred that the movement of stock prices in the Nairobi stock exchange reflect the macroeconomic condition of the country and can therefore be used to predict the future path of economic growth. Similarly, the study by Kirankabes and Başarir (2012) found that there is a long-term relationship between economic growth and the ISE 100 Index, and a one-way causality relationship with the ISE 100 towards economic growth.

Tadawul All Share Index (TASI) is the only general price index for the Saudi stock market. It is computed based on the calculation that takes into account traded securities or free-floating shares. According to Saudi capital law, shares owned by the following parties are excluded from TASI calculations: the Saudi government and its institutions; a foreign partner, if he or she is not permitted to sell without the prior approval of the supervision authority; a founding partner during the restriction period; and owners who hold 10% or more of a company's shares listed on the Saudi stock

market (Tadawul website 2013). At the end of 2010, free-floating shares on the TASI index accounted for 41% of total issued shares. TASI reflects the performance of all the 146 listed companies within fifteen sectors in the Saudi stock market taking into account the free-floating shares. Thus, it is expected to provide better insight into the overall performance of the Saudi stock market in response to fundamental changes within the Saudi economy.

The stock markets are very small, shallow, and illiquid. The secondary market for government papers is limited, the private capital markets nascent and insurance and pension funds not fully developed. Foreign investment in the nonbank financial sector, similar to the banking sector, is restrictive. The stock market data are on only available from 1985. The bond and ETF markets are established in 13 June 2009 and 28th March 2010 respectively.

3.2.2 Bank Credit to Private Sector (BCP)

The banking sector, which constitutes the core of the Saudi Arabian financial sector possess a number of common features. It is very concentrated and government dominated. However, as part of the policy to promote the private sector, divestiture of some state-owned banks has taken place in recent years. Banks are closely regulated and supervised, and are compliant or largely compliant with most Basel Core Principles as well as with international standards on anti-money laundering and the combating of terrorism financing. Banks face little changes in competition due in part to the restrictive policy for new bank entries during the past decades. In 2001, GCC banks were allowed to establish in other GCC countries; but as of end-2003, only a few banks have been licensed. Entry of non-GCC banks is still under consideration.

Banks are profitable and efficient. They offer a wide range of financial instruments for deposits and loans. In recent years, they have introduced new products (mortgage in Saudi Arabia), broadened or intensified their activities (private and investment banking, project financing, and Islamic banking), adopted new technologies (ATM, internet banking), and updated their financial skills.

Banks also benefit from well functioning payment systems which have been updated to international standards to ensure prompt registration, clearing, and settlement of transactions. Credit bureaus have been introduced in some countries, and are underway in others. Deposit insurance schemes exist in some countries and they have been considered for some time in others; although in the latter, bank deposits are implicitly guaranteed by the governments.

The bank credit to the private sector as a ratio of nominal GDP (BCP) represents more accurately the role of intermediaries to channel funds to private sector and it is more closely associated with investment and hence economic growth. Levine, Loyaza and Beck (2000) emphasised that BCP is (1) a good representation of the role of capital intermediaries in channelling funds to private market participants. (2) BCP can be an indicator of the functioning of the capital market because it is a measure of the quantity and quality of investment. (3) BCP excludes credit to the public sector which better reflects the extent of efficient resources allocation.

Commercial banks, in the modern economy, create most of the money supply by issuing loans. Therefore, when banks create an excess supply of money, the prices of assets, goods, and services tend to rise. Conversely, when not enough money is created, the prices of assets, goods, and services decrease. Thus, it is reasonable to hypothesise that a strong positive relationship exists between asset prices and bank lending.

Thus, this study will use BCP as a measurement for capital market development by following the steps of Omran and Bolbol (2003), Boulila and Trabelsi (2004), Chuah and Thai (2004), Al-Awad and Harb (2005), Naceur and Ghazouani (2007), Masih et. al. (2009), Goaied et. al. (2011) and Kar et. al. (2011).

The link between commercial banks in the Saudi economy is unique, in the sense that banks have a significant position in both the debt and equity markets since the intermediation function of the Saudi stock market was restricted by the law to commercial banks (SAMA 1997). Banks are the second largest supplier of credit in the Saudi economy after the government's mutual funds (Ramady 2010, SAMA 2011).

Bank credit to the private sector is used, for example, in King and Levine (1993), Gregorio and Guidotti (1995), Demetriades and Hussein (1996) and Khan and Senhadji (2000). However, bank credit to the private sector may be negatively correlated with growth as a result of negative correlation between bank credit and nonbank financial intermediation. The latter situation stems from the possibility that financial innovation may induce a substitution away from credit to stock market and other forms of direct financing. This possibility is unlikely to occur in the GCC countries because the stock markets have not been fully developed and direct financing of firms by bonds is still nascent and sufficiently long time series for these proxies are not available. As a result, this paper does not include measures of stock and bond markets as part of financial development.

In this study, it is vital to include BCP to help determine the effect of credit banks' lending behaviour on the Saudi economy. Examining the historical relationship between bank lending behaviour and the economy may also provide the Saudi authority with reliable knowledge about the role of bank loans in transmitting financial shocks to the real sector. In other words, understanding this channel may help authorities to stimulate bank loans as a way to boost real activity in the local economy.

3.2.3 Broad Money Supply (M2)

Darrat (1999), Al-Yousif (2002) and Kar et. al. (2011) used the degree of financial deepening is the inverse of the broad-money velocity, that is, the ratio of broad money stock (M2) to nominal GDP. This measure, suggested by McKinnon (1973) and Shaw (1973), and recently used by King and Levine (1993) is often called the monetisation variable (Z), which could measure the size of the financial market or 'financial depth'. An increase in this variable indicates further expansion in the financial intermediary sector relative to the rest of the economy since it implies faster accumulation of a wide range of financial assets (primarily saving accounts). As is typical with any empirical measurement of economic phenomenon, these proposed proxies are not perfect measures of the degree of financial deepening. In particular, changes in K and Z may not solely reflect financial deepening. For example, currency substitution could ignite similar changes in K. Nevertheless, in the absence of better alternatives, researchers continue using K and Z to approximately monitor financial development in various countries.

M2 is a broad measure of the money supply in the Saudi economy, and consists of the narrow money supply (M1) components, time deposits and savings deposits. Examining this measure is expected to give a comprehensive view of the role that the money supply plays in explaining movements in the Saudi economy.

3.3 The Control Variables (CV)

3.3.1 Interest Rate (IR)

In line with the literature review most empirics used real interest rate to measure financial repression. For example, Khan Qayyum and Sheikh (2005) found that changes in real interest rate exerted positive (negative) impact on economic growth. However, the response of real interest rate is very small in the short run.

Investigating the relationship between the interest rate and the Saudi economy is of particular interest to researchers for at least two reasons. First, the Saudi Monetary Authority works in a unique institutional environment in which charging interest is prohibited by Islamic law. That is, Islamic law does not consider money as an asset, and thus, money is viewed only as a measurement of value. For that reason, SAMA, the central bank in Saudi Arabia, has no direct control over the interest rate (Ramady 2010). Second, the Saudi currency has been pegged to the US dollar at a fixed exchange rate since 1986. This restriction makes local monetary policy conditional on the monetary policy of the US. In such an environment, interest rate based assets are not the primary alternative for the majority of investors in the Saudi economy. Money and capital markets in the Saudi economy are not substitutes but rather are independent.

Most empirical studies related to the Saudi economy use a short or a long term interest rate of the US market as a proxy for the Saudi market due to the Saudi exchange rate policy. However, this study do not use this variable for the reasons mentioned earlier.

3.3.2 Inflation (INF)

In line with, Bekaert and Harvey (1997), Darrat (1999), Al-Tamimi et. al. (2002), Omran and Bolbol (2003), Naceur and Ghazouani (2007) and Goaied et. al. (2011) they used inflation rate as an important variable on the economy. Fisher (1930) believes that the real and monetary sectors of the economy are independent, and claims that the nominal interest rate fully reflects the available information concerning the possible futures values of the rate of inflation. Thus, he hypothesises that the real return on interest rates is determined by real factors such as the productivity of capital and time preference of savers, hence, the real return on interest rates and the expected inflation rate are independent.

Thus, investors may benefit from this study to learn how to allocate their recourses more efficiently to protect the purchasing power of their investments, especially during inflationary periods. However, there are no enough available data on this variable that pre-date 1980.

3.3.3 Oil Price (OP)

Oil price was used in empirics associated with oil producing countries such as Mosesov and Sahawneh (2005) on the UAE and Naceur and Ghazouani (2007) on the MENA region.

The Saudi economy is a small oil-based economy that possesses nearly 20 per cent of the world's known petroleum reserves and is ranked as the largest exporter of petroleum (OPEC 2013). The oil sector in the Saudi economy contributes more than 85 per cent of the country's exports and government revenues (SAMA 2013). As a result, oil revenue plays a vital role in all major economic activities in Saudi Arabia. Hence, the Saudi economy also imports almost all manufactured and raw goods except for oil from developed and emerging countries.

Even though high oil prices impose a positive impact on the economy this may indirectly harm the economy through its influence on the prices of imported products. In other words, a high oil price may be fed back to the local economy as imported inflation, which increases future interest rates.

This study uses the Brent oil price rather than other oil benchmarks - and Dubai-Oman oil prices - mainly because it is used to price two-thirds of the crude oil internationally traded.

4. Methodology

In this study the method of vector autoregressive model (VAR) is adopted to estimate the effects of stock and credit market development on economic growth. In order to test the causal relationships, the following multivariate model is to be estimated.

$$Y = f(CMD, CV) \quad (4.1)$$

Where:

Y = Economic Growth variables.
CMD = Capital Market Development variables.
CV = Control variables.

4.1 Analytical Framework

The analytical framework of this study can be modelled in VAR form for the proposed empirical investigation:

$$Y_t = \alpha + \Phi Y_{t-1} + \varepsilon_t \quad (4.2) \quad \varepsilon_t \text{ IID } (0, \Omega)$$

Where: Φ = a matrix of AR (1) coefficients
Ω = a covariance matrix of the error terms
Y_t = a vector, which contains Y, CMD and CV

Many researchers use Vector Autoregression (VAR) modelling (Agrawalla & Tuteja 2007; Ake & Ognaligui 2010; Demirhan, Aydemir & Inkaya 2011; Khan, Qayyum & Sheikh 2005). The VAR model, according to Juselius (2006), is a flexible model for the analysis of multivariate time series. It is a natural extension of the univariate autoregressive model for dynamic multivariate time series. The VAR model is especially useful for describing the dynamic behaviour of economic and financial time series. Due to these advantages, VAR and vector error correction models (VECM) were generally used in previous studies. However, VAR models may require a large lag length to adequately describe a series; thus, there is a loss of precision due to the extent of the parameters estimated.

4.2 VAR Models

4.2.1 VAR(1)

$$GDP = f(SMI, IR, INF, OP) \quad (4.3)$$

4.2.2 VAR(2)

$$GDP = f(BCP, IR, INF, OP) \quad (4.4)$$

4.2.3 VAR(3)

$$GDP = f(M2, IR, INF, OP) \quad (4.5)$$

4.2.4 VAR(4)

$$NOGDP = f(SMI, IR, INF, OP) \quad (4.6)$$

4.2.5 VAR(5)

$$NOGDP = f(BCP, IR, INF, OP) \quad (4.7)$$

4.2.6 VAR(6)

$$NOGDP = f(M2, IR, INF, OP) \quad (4.8)$$

Where: GDP = Real GDP Growth Rates.
NOGDP = Real Non-Oil GDP Growth Rate.
SMI = Stock Market Index.
BCP = Bank Credit to Private Sector.
M2 = Broad Money Supply.
IR = Interest Rate.
INF = Inflation Rate.
OP = Oil Price.

All variables are in logarithm except GDP because of some negative values.

5. Results

5.1Descriptive Analysis

Table 5.1 summarises the basic statistical features of the data under consideration, including the mean, the minimum and maximum values, standard deviation, kurtosis, skewness and the Jarque-Bera test for the data in their levels. This descriptive statistics provide a historical background for the behaviour of the data in this study. For instance, the standard deviations indicate that GDP, SMI, BCP, IR and OP are more volatile than M2 and INF (see Table 5.1). This is perhaps because the nature of the oil-based economy dependents on the fluctuations of the oil prices (SAMA 2013). Furthermore, the standard deviation indicates that the inflation rate (INF) is the least volatile compared to other macroeconomic variables during the same time.

P-values associated with the Jarque-Bera statistics, a test for departures from normality, show that the sample skewness and kurtosis are significantly different from zero and three respectively (Table 5.1). Given that the kurtosis of GDP, SMI, BCP, M2, INF and OP variables are all less than three, the distributions of these variables exhibit non-normality (Stock & Watson 2006). The positive values of the skewness tests for GDP, SMI, BCP and FDI suggest that these variables have long right tails, while negative values of the skewness tests for NOGDP and IR suggest that these two variables have long left tails (Stock & Watson 2006).

Although there is no indication of causation, the results reported in Table 5.2 reveal information on the strength of the relationships connecting the macroeconomic variables. In particular, Table 5.2 shows a positive relationship between both of the economic growth variables (GDP and NOGDP) and the rest of the macroeconomic variables in the time-series (SMI, BCP, M2, INF and OP). On the other hand, a negative relationship exists between all the variables in the series with the interest rate (IR).

Table 5.1. Statistical features of the Macroeconomic variables

	GDP	NOGDP	SMI	BCP	M2	IR	INF	OP
Mean	2.619588	1.199035	8.063292	5.394410	12.63631	1.273278	4.627449	3.385611
Median	2.645867	1.309770	7.768527	5.187218	12.48041	1.577301	4.610257	3.244349
Maximum	7.946421	1.656937	9.878306	6.618427	13.65092	1.955241	4.834002	4.897093
Minimum	-1.102634	-0.227042	7.041587	4.491553	12.03999	-1.599868	4.548790	2.282382
Std. Dev.	2.177265	0.471524	0.788889	0.642629	0.487986	0.683222	0.064257	0.620824
Skewness	0.356721	-1.503642	0.599593	0.621988	0.677363	-1.713942	1.853055	0.517218
Kurtosis	2.490407	4.426502	2.002002	2.027919	2.212334	6.241557	5.613883	2.220229
Jarque-Bera	6.533817	94.16865	20.68942	21.18555	20.87348	189.1936	174.8249	14.26385
Probability	0.038124	0.000000	0.000032	0.000025	0.000029	0.000000	0.000000	0.000799
Sum	534.3960	244.6031	1644.912	1100.460	2577.807	259.7486	943.9996	690.6647
Sum Sq. Dev.	962.3182	45.13402	126.3362	83.83340	48.34039	94.75871	0.838184	78.24084
Observations	204	204	204	204	204	204	204	204

Table 5.2. Covariance Analysis

Correlation								
Probability	GDP	NOGDP	SMI	BCP	M2	IR	INF	OP
GDP	1.000000							

NOGDP	0.538188	1.000000						
	0.0000	-----						
SMI	0.551938	0.641640	1.000000					
	0.0000	0.0000	-----					
BCP	0.369023	0.539090	0.872268	1.000000				
	0.0000	0.0000	0.0000	-----				
M2	0.366674	0.561516	0.851604	0.994213	1.000000			
	0.0000	0.0000	0.0000	0.0000	-----			
IR	-0.184546	-0.232547	-0.380673	-0.511778	-0.561539	1.000000		
	0.0082	0.0008	0.0000	0.0000	0.0000	-----		
INF	0.077054	0.226045	0.412037	0.760032	0.780904	-0.499872	1.000000	
	0.2733	0.0012	0.0000	0.0000	0.0000	0.0000	-----	
OP	0.377939	0.557204	0.899214	0.918510	0.912904	-0.413084	0.618628	1.000000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-----

5.2 Long-Run Analysis

5.2.1 Unit Root Test

The results from the augmented Dickey-Fuller (1979) (ADF) unit root test, and Phillips-Perron (1988) (PP) tests provide additional support for treating all the individual series as non-stationary in their levels but stationary in their first differences.

5.2.2 Optimal Lag Tests

We precede our analysis using 3 lags suggested by Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ).

5.2.3 Cointegration Test

Following the rough guide in the EViews 7 User's Guide II (2012), and since we believe that all of the data series have stochastic trends, the analysis proceeds to examine the long run and short run relationships between the economic growth variables and the rest of the macroeconomic variables in the system assuming a linear trend in the VAR and the cointegrating relationship only has an intercept. Hence, in the presence of more than cointegration vector Johansen and Juselius (1990) suggested that the first eigenvector is the most useful to use in examining the long run relationship between variables in the system (Mukherjee and Atsuyuki, 1995).

The major implications derived from these two tests are:

(1) The macroeconomic variables in the system share a long run relationship. Hence each variable in the system tends to adjust proportionally to remove short run deviations from the long run equilibrium.

(2) There is at least one direction of causality among the variables in the system as expected by the

Granger representation theorem.

Finding a long run relationship between the economic growth variable (NOGDP) and the capital market development variables in the Saudi economy is consistent with a large body of empirical studies including Levine (1991); King and Levine (1993); Atje and Jovanovic (1993) Levine and Zervos (1996,1998); Demirguc-Kunt and Levine (1996); Arestis et al (2001); Al-Yousif (2002); Thangavelu and James (2004); Mosesov and Sahawneh (2005); Abu-Sharia (2005); Abu-Bader and Abu-Oarn (2006); Athanasios and Antonios (2010); Mishal (2011); Demirhan, Aydemir and Inkaya (2011); and Al-Malkawi et al. (2012).

However, there is only a negative and significant relationship between the economic growth variable (GDP) and the capital market development variable (SMI).

Given that there is at least one cointegration vector among the variables in the system, the analysis normalises the cointegrating vector on (GDP, NOGDP). Equations (5.1-5.6) presents these findings, which indicate, in general, that all capital market development variables included in the VAR models are statistically significantly contributing to the long run relationships with the economic growth when using NOGDP variable.

VAR (1): (5.1)

D(GDP) = A(1,1)*(B(1,1)*GDP(-1) + B(1,2)*LSMI(-1) + B(1,3)*LIR(-1) + B(1,4)*LINF(-1) + B(1,5)*LOP(-1) + B(1,6)) + C(1,1)*D(GDP(-1)) + C(1,2)*D(GDP(-2)) + C(1,3)*D(GDP(-3)) + C(1,4)*D(LSMI(-1)) + C(1,5)*D(LSMI(-2)) + C(1,6)*D(LSMI(-3)) + C(1,7)*D(LIR(-1)) + C(1,8)*D(LIR(-2)) + C(1,9)*D(LIR(-3)) + C(1,10)*D(LINF(-1)) + C(1,11)*D(LINF(-2)) + C(1,12)*D(LINF(-3)) + C(1,13)*D(LOP(-1)) + C(1,14)*D(LOP(-2)) + C(1,15)*D(LOP(-3)) + C(1,16)

D(RGDPR) = - 0.00179720602569*(GDP(-1) - 1.76668529906*LSMI(-1) - 0.353315200157*LIR(-1) - 7.40096025985*LINF(-1) - 0.296731969874*LOP(-1) + 47.3433452632) + 1.48090630713*D(GDP(-1)) - 0.159900957692*D(GDP(-2)) - 0.370311818447*D(GDP(-3)) + 0.00327814943376*D(LSMI(-1)) + 0.0437628631718*D(LSMI(-2)) + 0.0437245379792*D(LSMI(-3)) - 0.0128262318107*D(LIR(-1)) + 0.00108704944885*D(LIR(-2)) + 0.00552818338651*D(LIR(-3)) - 0.17652891817*D(LINF(-1)) - 0.148810619315*D(LINF(-2)) - 0.00620030889853*D(LINF(-3)) + 0.0147960720268*D(LOP(-1)) - 0.00478542745239*D(LOP(-2)) - 0.00536411925617*D(LOP(-3)) - 0.0009139834765

VAR (2): (5.2)

D(RGDPR) = A(1,1)*(B(1,1)*GDP(-1) + B(1,2)*LBCP(-1) + B(1,3)*LIR(-1) + B(1,4)*LINF(-1) + B(1,5)*LOP(-1) + B(1,6)) + C(1,1)*D(GDP(-1)) + C(1,2)*D(GDP(-2)) + C(1,3)*D(GDP(-3)) + C(1,4)*D(LBCP(-1)) + C(1,5)*D(LBCP(-2)) + C(1,6)*D(LBCP(-3)) + C(1,7)*D(LIR(-1)) + C(1,8)*D(LIR(-2)) + C(1,9)*D(LIR(-3)) + C(1,10)*D(LINF(-1)) + C(1,11)*D(LINF(-2)) + C(1,12)*D(LINF(-3)) + C(1,13)*D(LOP(-1)) + C(1,14)*D(LOP(-2)) + C(1,15)*D(LOP(-3)) + C(1,16)

D(RGDPR) = - 0.00104868081916*(GDP(-1) + 0.292659428027*LBCP(-1) - 0.166643334979*LIR(-1) - 9.26056180223*LINF(-1) - 2.5893231905*LOP(-1) + 47.6427682274) + 1.51473447189*D(GDP(-1)) - 0.208510644915*D(GDP(-2)) - 0.354571261551*D(GDP(-3)) + 0.00885338309744*D(LBCP(-1)) - 0.100133163851*D(LBCP(-2)) + 0.0985660628442*D(LBCP(-3)) - 0.0128577409165*D(LIR(-1)) - 0.000321993972595*D(LIR(-2)) + 0.00440330334655*D(LIR(-3)) - 0.128329711138*D(LINF(-1)) - 0.103576536977*D(LINF(-2)) - 0.196954741946*D(LINF(-3)) + 0.0207210040137*D(LOP(-1)) + 0.0108269907915*D(LOP(-2)) + 0.00503480475442*D(LOP(-3)) - 0.000606057158487

VAR (3): (5.3)

D(RGDPR) = A(1,1)*(B(1,1)*GDP(-1) + B(1,2)*LM2(-1) + B(1,3)*LIR(-1) + B(1,4)*LINF(-1) + B(1,5)*LOP(-1) + B(1,6)) + C(1,1)*D(GDP(-1)) + C(1,2)*D(GDP(-2)) + C(1,3)*D(GDP(-3)) + C(1,4)*D(LM2(-1)) +C(1,5)*D(LM2(-2)) + C(1,6)*D(LM2(-3)) + C(1,7)*D(LIR(-1)) + C(1,8)*D(LIR(-2)) + C(1,9)*D(LIR(-3)) + C(1,10)*D(LINF(-1)) + C(1,11)*D(LINF(-2)) + C(1,12)*D(LINF(-3)) + C(1,13)*D(LOP(-1)) + C(1,14)*D(LOP(-2)) + C(1,15)*D(LOP(-3)) + C(1,16)

D(RGDPR) = 0.000138886897223*(GDP(-1) + 0.968158512723*LM2(-1) - 0.263857820774*LIR(-1) - 10.0320975533*LINF(-1)-5.75497472121*LOP(-1) + 51.4078481577) + 1.50899406532*D(GDP(-1)) - 0.173964679883*D(GDP(-2)) - 0.385726321604*D(GDP(-3)) + 0.0455698971217*D(LM2(-1)) + 0.253032025605*D(LM2(-2)) - 0.0252147952512*D(LM2(-3)) -0.00934317195848*D(LIR(-1)) - 0.000820650405583*D(LIR(-2))- 0.00172555822101*D(LIR(-3)) - 0.110032505443*D(LINF(-1)) - 0.0347867690477*D(LINF(-2)) - 0.0853591131399*D(LINF(-3))+0.0286838973307*D(LOP(-1)) + 0.00972534403679*D(LOP(-2)) + 0.00429022203878*D(LOP(-3)) - 0.00300481437013

VAR (4): (5.4)

D(RNOIL) = A(1,1)*(B(1,1)*LNOGDP(-1) + B(1,2)*LSMI(-1) + B(1,3)*LIR(-1) + B(1,4)*LINF(-1) + B(1,5)*LOP(-1) + B(1,6)) + C(1,1)*D(LNOGDP(-1)) + C(1,2)*D(LNOGDP(-2)) + C(1,3)*D(LNOGDP(-3)) + C(1,4)*D(LSMI(-1)) + C(1,5)*D(LSMI(-2)) + C(1,6)*D(LSMI(-3)) + C(1,7)*D(LIR(-1)) + C(1,8)*D(LIR(-2)) + C(1,9)*D(LIR(-3)) + C(1,10)*D(LINF(-1)) + C(1,11)*D(LINF(-2)) + C(1,12)*D(LINF(-3)) + C(1,13)*D(LOP(-1)) + C(1,14)*D(LOP(-2)) + C(1,15)*D(LOP(-3)) + C(1,16)

D(RNOIL) = - 0.000985545647958*(LNOGDP(-1) + 0.759102743443*LSMI(-1) - 0.198248676173*LIR(-1) - 4.07994215652*LINF(-1) - 2.19036998715*LOP(-1) + 19.2397473113) + 1.64819382976*D(LNOGDP(-1)) - 0.489950771976*D(LNOGDP(-2)) - 0.201257983605*D(LNOGDP(-3)) + 0.00564669471079*D(LSMI(-1)) + 0.00438411657755*D(LSMI(-2)) + 0.00431212309293*D(LSMI(-3)) + 0.00306493386399*D(LIR(-1)) - 0.000235896365299*D(LIR(-2)) - 0.00222836651304*D(LIR(-3)) - 0.123107433756*D(LINF(-1)) - 0.0636532196547*D(LINF(-2)) - 0.0439096303692*D(LINF(-3)) - 0.00666281573893*D(LOP(-1)) - 0.00350771290205*D(LOP(-2)) - 0.00214987390671*D(LOP(-3)) + 0.000401437621344

VAR (5): (5.5)

D(RNOIL) = A(1,1)*(B(1,1)*LNOGDP(-1) + B(1,2)*LBCP(-1) + B(1,3)*LIR(-1) + B(1,4)*LINF(-1) + B(1,5)*LOP(-1) + B(1,6)) + C(1,1)*D(LNOGDP(-1)) + C(1,2)*D(LNOGDP(-2)) + C(1,3)*D(LNOGDP(-3)) + C(1,4)*D(LBCP(-1)) + C(1,5)*D(LBCP(-2)) + C(1,6)*D(LBCP(-3)) + C(1,7)*D(LIR(-1)) + C(1,8)*D(LIR(-2)) + C(1,9)*D(LIR(-3)) + C(1,10)*D(LINF(-1)) + C(1,11)*D(LINF(-2)) + C(1,12)*D(LINF(-3)) + C(1,13)*D(LOP(-1)) + C(1,14)*D(LOP(-2)) + C(1,15)*D(LOP(-3)) + C(1,16)

D(RNOIL) = - 0.000965408577069*(LNOGDP(-1) + 1.09855630459*LBCP(-1) - 0.132186020658*LIR(-1) - 8.11174983846*LINF(-1) - 1.9595517293*LOP(-1) + 37.2204824303) + 1.67058640794*D(LNOGDP(-1)) - 0.537868607607*D(LNOGDP(-2)) -0.173617810544*D(LNOGDP(-3)) - 0.00991715324502*D(LBCP(-1)) + 0.0115741281591*D(LBCP(-2)) - 0.0166563009356*D(LBCP(-3)) + 0.00276505885787*D(LIR(-1)) - 9.23488218473e-05*D(LIR(-2)) - 0.00235175947012*D(LIR(-3)) - 0.116535496131*D(LINF(-1)) - 0.0698183801019*D(LINF(-2)) - 0.0423674684253*D(LINF(-3)) - 0.0044037105407*D(LOP(-1)) - 0.00202884873897*D(LOP(-2)) - 0.000327631913615*D(LOP(-3)) + 0.00060631065353

VAR (6): (5.6)

D(RNOIL) = A(1,1)*(B(1,1)*LNOGDP(-1) + B(1,2)*LM2(-1) + B(1,3)*LIR(-1) + B(1,4)*LINF(-1) + B(1,5)*LOP(-1) + B(1,6)) + C(1,1)*D(LNOGDP(-1)) + C(1,2)*D(LNOGDP(-2)) + C(1,3)*D(LNOGDP(-3)) + C(1,4)*D(LM2(-1)) + C(1,5)*D(LM2(-2)) + C(1,6)*D(LM2(-3)) + C(1,7)*D(LIR(-1)) + C(1,8)*D(LIR(-2)) + C(1,9)*D(LIR(-3)) + C(1,10)*D(LINF(-1)) + C(1,11)*D(LINF(-2)) + C(1,12)*D(LINF(-3)) + C(1,13)*D(LOP(-1)) + C(1,14)*D(LOP(-2)) + C(1,15)*D(LOP(-3)) + C(1,16)

D(RNOIL) = - 0.000687200999305*(LNOGDP(-1) + 3.08295034883*LM2(-1) + 0.00987930170814*LIR(-1) - 11.9892166942*LINF(-1) - 3.106999132*LOP(-1) + 25.834680305) + 1.673609996*D(LNOGDP(-1)) - 0.5369869769*D(LNOGDP(-2)) - 0.177344037017*D(LNOGDP(-3)) + 0.0273581857273*D(LM2(-1)) - 0.00880678375625*D(LM2(-2)) -0.0176647320278*D(LM2(-3)) + 0.00213330131843*D(LIR(-1)) - 0.000982716625643*D(LIR(-2)) - 0.003017304147 14*D(LIR(-3)) - 0.122548182321*D(LINF(-1)) - 0.0607138579366*D(LINF(-2)) - 0.0597315575112*D(LINF(-3)) - 0.00479899427036*D(LOP(-1)) - 0.00266084682408*D(LOP(-2)) - 0.000114161865417*D(LOP(-3)) + 0.00043601065477

The normalised cointegrating vectors given in Equations (5.1-5.6) suggest the following results.

5.2.3.1 VAR (1)

A significant and negative long-run relationship between GDP and SMI is found in this study. This result is in alignment with the empirical studies by Athanasios and Antonios (2010) and Olweny and Kimani's (2011) findings imply that the causality between economic growth and stock market runs unilaterally from the NSE 20-share index to the GDP. From the results, it was inferred that the movement of stock prices in the Nairobi stock exchange reflect the macroeconomic condition of the country and can therefore be used to predict the future path of economic growth; Kirankabes and Başarir (2012) found that there is a long-term relationship between economic growth and the ISE 100 Index, and a one-way causality relationship with the ISE 100 towards economic growth. Asiegbu and Akujuobi (2010) found that the All-Share Index and number of listed companies have a positive significant effect on economic growth.

The negative relationship results do make sense because:

1. At the end of 2009, free-floating shares on the TASI index accounted for 37.9 per cent of total issued shares.
2. The number of listed companies is very little compare to the size of the market as the Arab, Middle East and North Africa biggest capital market. Kolapo and Adaramola (2012)
3. Recommended that the regulatory authority should initiate policies that would encourage more companies to access the market and also be more proactive in their surveillance role in order to check sharp practices which undermine market integrity and erode investors' confidence.
4. The stock market is still characterised by a high degree of sectoral concentration and the dominance of banking, electricity and telecommunications, with six companies accounting for nearly 70 per cent of the total market capitalisation.
5. 90 per cent of investors are Saudi individuals who are characterised by irrational exuberance and herd mentality (Al-Twaijry 2007; Ramady 2010).

As a young and rapidly developing stock market, a positive relationship with the economic growth might exist once it has matured as observed in the literature. The establishment of the CMA has helped to overcome some of the previous obstacles in expanding the capital market, namely an increase in the number of listed companies, increase in the number of shareholders, expansion of brokerage and investment advisory services and licensing of non-bank financial institutions. The benefits of the CMA could be felt in several areas: potential to draw back Saudi resources invested abroad, growth of non-oil financial services sector, improvement in risk management practices and response to the infrastructure services demand. The Saudi stock market has made some progress in opening up to foreign investors through swap facilities and there are some developments in expanding the use of ETFs and index funds.

5.2.3.2 VAR (2)

A positive long-run relationship (although statistically insignificant) between GDP and BCP is found in this study. These results are in alignment with the 'independent' view that argues that capital market and economic growth is not causally related (e.g. Stiglitz

1985, Mayer 1988, Boyd and Smith 1998, Boulila & Trabelsi 2004, Mosesov & Sahawneh 2005, Abu-Bader & Abu-Qarn 2006, Naceur & Ghazouani 2007). These empirics were mostly conducted in the developing Middle East and North Africa (MENA) countries. In addition, this is supported by Mohamed (2008) who related this result to the inefficient allocation of resources by banks, the absence of proper investment climate, and to the poor quality of credit disposal of the banking sector. Furthermore, this lack of relationship between BCP and GDP can be related to the banking environment in Saudi Arabia that is characterised of;

1. The issue of shareholder concentration is one of the major concerns for the Saudi banking sector, as it is for most other publicly listed Saudi joint stock companies. The trend towards far fewer shareholders is unmistakable and there are several implications. First, holding a higher concentration of shares in fewer hands might enable some business groups to influence day-to-day operations and bank management through board representation. Second, the concentration of shares in a few hands with block votes 'de-democratises' the role of annual general meetings in joint stock companies. Concentration eliminates transparency and leads to joint stock companies operating like partnerships.

2. The issue of competition, the same three banks, NCB, SAMBA and Al Rajhi, dominated, although Riyad Bank came a close fourth. Despite new entrants into the Saudi banking sector, the top three continued to dominate, the only erosion being seen in their loan and asset share. Studies conducted in the area of bank concentration and economic efficiency indicates that a high concentration ratio may induce banks to charge borrowers with higher interest rates than when there is a low banking concentration. According to Saudi studies, the non-interventionist policy of SAMA in this area of bank regulation could hamper the growth of companies, particularly SMEs, due to more restrictive credit conditions by the banks within a system of imperfect competition (Essayyad, Ramady & Al Hejji 2003).

3. Saudi banks have traditionally a low loans-to-deposit ratio and thus more liquidity compared to other Western institutions. The majority of bank lending was of less than a year's duration, which is not conducive to long-term industrial investment and planning. Filling a need for long-term investment capital was the prime reason for the Saudi government's establishment of its own lending agencies.

4. Saudi banks suffer from widening asset-liability maturity mismatch, raising major concerns about banks' liquidity risk as well as credit risk.

5. Consumer loans represented around 38 per cent of all private sector loans. According to SAMA (2011), the majority were for financing motor vehicles and 'other' unspecified personal loans; real estate and credit-card financing remained steady.

Commercial banks are the second largest supplier of credit in the Saudi economy after the government's mutual funds and special purposes banks. In the modern economy, they create most of the money supply by issuing loans. Therefore, when banks create an excess supply of money, the prices of assets, goods, and services tend to rise. Conversely, when not enough money is created, the prices of assets, goods, and services decrease (Ramady 2010).

5.2.3.3 VAR (3)

A positive long-run relationship (although statistically insignificant) between GDP and M2 is found in this study. These results are contrasted with, King and Levine (1993), Levine and Zervos (1998), Al-Yousif (2002), Ake and Ognaligui (2010), Demirhan, Aydemir and Inkaya (2011), Dritsaki and Dritsaki-Bargiota (2005), the cointegration tests revealed is a significant and positive relationship for M2. Still, the existing theoretical and empirical studies show no consensus regarding the relationship between the money supply (M2) and GDP (Jung 1986, Demirhan, Aydemir & Inkaya 2011).

5.1.3.4 VAR (4)

A significant positive long-run relationship between RNOIL and SMI is found in this VAR model. This is contrasted to the VAR (1) model result and in line with empirical studies by Athanasios and Antonios (2010) and Olweny and Kimani's (2011) findings imply that the causality between economic growth and stock market runs unilaterally from the NSE 20-share index to the GDP. From the results, it was inferred that the movement of stock prices in the Nairobi stock exchange reflect the macroeconomic condition of the country and can therefore be used to predict the future path of economic growth; Kirankabes and Başarir (2012) found that there is a long-term relationship between economic growth and the ISE 100 Index, and a one-way causality relationship with the ISE 100 towards economic growth. Asiegbu and Akujuobi (2010) found that the All-Share Index and number of listed companies have a positive significant effect on economic growth.

5.2.3.5 VAR (5)

A significant positive long-run relationship between RNOIL and BCP is found in this VAR model. Similar to the VAR (2) model result however significant this result is in line with Chuah and Thai (2004), they used real non-hydrocarbon GDP in order to capture the real impact of bank based development variables on economic growth for six GCC countries including Saudi Arabia. Chuah and Thai (2004) used annual data over the period 1962-1999 for Saudi Arabia. They applied a bivariate time series model and concluded that capital market development provides

critical services to increase the efficiency of intermediation, leading to a more efficient allocation of resources, a more rapid accumulation of physical and human capital, and faster technological innovation.

5.2.3.6 VAR (6)

A significant positive long-run relationship between RNOIL and M2 is found in this VAR model. This result is in line with, King and Levine (1993), Levine and Zervos (1998), Al-Yousif (2002), Ake and Ognaligui (2010), Demirhan, Aydemir and Inkaya (2011), Dritsaki and Dritsaki-Bargiota (2005), the cointegration tests revealed is a significant and positive relationship for M2. Still, the existing theoretical and empirical studies show no consensus regarding the relationship between the money supply (M2) and GDP (Jung 1986, Demirhan, Aydemir & Inkaya 2011).

This result is contrasted to the VAR (3) and with Darrat (1999) who investigated the relationship between financial deepening and economic growth for three developing Middle-Eastern countries (Saudi Arabia, Turkey and the UAE). He applied Granger-Causality tests and VAR method over the period of 1964-1993 for Saudi Arabia. The study found no long run relationship between financial deepening variable (M2) and economic growth in the case of Saudi Arabia.

5.3 Short-Run Analysis

Having established that most of the macroeconomic variables in the analysis are cointegrated, the fundamental question that needs to be asked is: what is the nature of the dynamic relationship between these variables in the short run? This question can be answered using the causality tests. The following sub sections present the results for these methodologies.

5.3.1 Causality Tests

The short run analysis is performed using a vector error correction model as developed by Engle and Granger (1987). Granger (1988) states that using a VECM rather than a VAR in differences will not result in any loss in long run information, as is the case for the Granger (1969) causality test. The following two sections present the results of both the VECM and Granger causality tests.

5.3.1.1. VECM Causality Tests

In this section, a VECM is estimated to investigate the short and long run dynamic adjustment of a system of cointegrated variables. The estimation equation (5.7) is:

$$\Delta Xt = \delta + \sum + \quad + vt$$

where ΔXt is an nx1 vector of variables and δ is an (*nx1*) vector of constants. Π is the error- correction mechanism, which has two components: $\Pi=\alpha\beta'$ where α is an (*nx1*) column vector representing the speed of the short run adjustment to the long-run equilibrium, and β′ is a (*1xn*) cointegrating vector with the matrix of long run coefficients. Γ is an (*nxn*) matrix representing the coefficients of the short run dynamics. Finally, *vt* is an (*nx1*) vector of white noise error terms, and *p* is the order of the auto-regression. Interestingly, Equation 5.7 has two channels of causation. The first channel is through the lagged exogenous variables' coefficients. The second channel of causation is through the error correction term. The ECT captures adjustment of the system towards its long run equilibrium.

Since the VECM technique is a more general case of the standard VAR model, the analysis proceeds to determine the lag length, , for the dynamic terms, i.e., the lagged variables in first difference form, the number of cointegrating vectors, and the structural cointegrating vector of the VECM. The optimal lag is p = 3 based on the previous equations (4.3-4.8).

The VECM short run results shows only a unidirectional relationship run from M2 to NOGDP this results are consistent with First, the conventional view of the supply leading hypothesis postulates that the direction of causality flows from capital market development to steady-state economic growth. In a world without frictions caused by transaction, information, and monitoring costs, no financial intermediaries are needed. If those costs are sufficiently high, no exchanges among economic agents will take place. The need to reduce those costs for exchanges to take place has led to the emergence of financial institutions and markets constituting the financial sector. A well-developed financial sector provides critical services to reduce those costs and thus to increase the efficiency of intermediation. It mobilises savings, identifies and funds good business projects, monitors the performance of managers, facilitates trading, diversification of risks, and fosters exchange of goods and services. These services result in a more efficient allocation of resources, a more rapid accumulation of physical and human capital, and faster technological innovation, thus inducing faster long-term economic growth

This view can be traced back to Schumpeter (1912), Goldsmith (1969), McKinnon (1973), Shaw (1973) King and Levine (1993) and Pagano (1993) all of whom investigated the effect of capital market development on economic growth (Demirhan, Aydemir & Inkaya 2011;

Levine & Zervos 1998). Schumpeter's (1912) important early study proposed a causal link whereby capital markets promote economic growth by funding entrepreneurs and channelling capital to them with higher return investments (Ake & Ognaligui 2010; Demirhan, Aydemir & Inkaya 2011; Dritsaki &

Dritsaki-Bargiota 2005; Levine & Zervos 1998). Schumpeter's

(1912) view was that economic change could not simply be predicated on previous economic conditions alone, although prevailing economic conditions were a result of this. Similarly, Goldsmith (1969) emphasised the effect of the financial structure and development on economic growth.

5.3.1.2 Granger Causality Tests

This section presents Granger causality test results for the short-run relationship between both of the economic growth variables (RGDP & RNOIL) and the capital market development variables of (SMI, BCP & M2). Since these variables are cointegrated. As concluded earlier, the Granger causality test is appropriate to examine the short-run dynamic relationships between these five variables.

The reported results of the Granger causality test (1969) in Table 5.3 are based on a (3) lag model that was suggested by SC and HQ previously in the VAR models. The result of the (3) lags models shows a bidirectional relationship between GDP and SMI, and a unidirectional relationship from GDP to BCP. In addition, M2 found to Granger-cause both of the economic growth variables (GDP &NOGDP) at the 10 per cent significant level. This is another evidence of none existence census among scholars along with the influence of methodology, data period, frequency and variables used in the study on results.

Table 5.3. Pairwise Granger Causality Tests (Sample: 1993M01 2009M12)

Lags: 3

VAR (1)			
Null Hypothesis:	Obs	F-Statistic	Prob.
SMI does not Granger Cause GDP	201	2.82713	0.0398
GDP does not Granger Cause SMI		2.75884	0.0435
VAR (2)			
Null Hypothesis:	Obs	F-Statistic	Prob.
BCP does not Granger Cause GDP	201	1.28443	0.2810
GDP does not Granger Cause BCP		6.00138	0.0006
VAR (3)			
Null Hypothesis:	Obs	F-Statistic	Prob.
M2 does not Granger Cause GDP	201	2.54884	0.0571
GDP does not Granger Cause M2		0.49871	0.6836
VAR (4)			
Null Hypothesis:	Obs	F-Statistic	Prob.
SMI does not Granger Cause NOGDP	201	1.29748	0.2766
NOGDP does not Granger Cause SMI		0.88313	0.4508
VAR (5)			
Null Hypothesis:	Obs	F-Statistic	Prob.
BCP does not Granger Cause NOGDP	201	1.90116	0.1307
NOGDP does not Granger Cause BCP		1.49050	0.2184
VAR (6)			
Null Hypothesis:	Obs	F-Statistic	Prob.
M2 does not Granger Cause NOGDP	201	2.60196	0.0533
NOGDP does not Granger Cause M2		1.82815	0.1434

6. Conclusion

This study aimed to determine the relationship between capital market development and economic growth in Saudi Arabia. The study is particularly significant because Saudi Arabia is moving aggressively towards strengthening the private sector role in the economy via privatisation, its establishment of the CMA in 2003, and the creation of seven new economic cities.

This study provided a comprehensive theoretical consideration of how the financial system and stock market development could affect real economic growth. In finance theory, there are four basic functions and channels in which the stock market may influence economic growth:

(1) the stock market provides investors and entrepreneurs with a potential exit mechanism;

(2) capital inflows in both foreign direct investment and portfolio are potentially important sources of investment funds; (3) the provision of liquidity through an organised stock market encourages both international and domestic investors to transfer their surplus from short-run assets to the long-run capital market; and (4) the stock market provides important information that improves the efficiency of financial intermediation generally.

In contrast, the endogenous growth model in economic theory illustrates that stock market development may affect economic growth through an increase in the saving rate, the channelling of more savings to investment, and the improvement of capital

productivity with better resource allocation towards their most productive use. Thus, savings channeled through the stock market is allocated more efficiently, and the higher capital productivity leads to higher economic growth.

This study investigated the relationship between financial market development and the real GDP growth rate per capita of the Saudi economy from January 1993 to December 2009. The secondary data was collected from the IMF, SAMA and TadawuL. The VAR model was used to estimate the effects of stock and credit market development on economic growth. In order to test the causal relationships, the following multivariate model was estimated:

$$Y = f(CMD, CV) \quad (4.1)$$

Where:

Y = Economic Growth variables (GDP & NOGDP).

CMD = Capital Market Development variables (SMI, BCP & M2).

CV = Control variables (IR, INF & OP).

Controlling variables from previous studies were also used. All variables were in logarithm except GDP because of some negative values:

The VAR model is a flexible model for the analysis of multivariate time series. It is a natural extension of the univariate autoregressive model for dynamic multivariate time series. The VAR model is especially useful for describing the dynamic behaviour of economic and financial time series. In addition to data description, the VAR model is also used for structural inference and policy analysis. VAR models and VECMs were generally used in previous studies. They also offered a feasible approach to this study due to the robustness and rigour of the data.

This study investigates the relationship between capital market development and economic growth of the Saudi economy over the period January 1993 to December 2009. The secondary monthly data (204 observations) of the variables selected for the VAR models are collected from the IMF, SAMA and the Saudi stock exchange Tadawul.

We used real GDP growth rate (GDP) and real non-oil GDP growth rate (NOGDP) as proxies for economic growth; Stock market development (SMI) proxied by the Tadawul All share index (TASI), the broad money supply (M2) and bank credit (BCP) of local commercial banks for the private sector as proxies for capital market development. Controlled by (1) a short term interest rate (IR), the Saudi Arabia Interbank Offered Rate (Isa3); (2) inflation (INF) in the Saudi economy measured by the consumer price index (CPI);

(3) world oil price (OP) proxied by the UK-Brent crude price oil.

These variables were statistically analysed, starting with descriptive statistics and then undertaking long-run and short-run analyses using Johansen-Juselius cointegration tests, the VECM and the Granger causality test. The results from the ADF and PP unit root tests provided additional support for treating all the individual series as non-stationary in their levels but stationary in their first differences. The analysis was preceded by the use of 3 lags suggested by the SC and HQ tests.

The VAR models indicate a positive and significant long-term causal relationship between capital market development and economic growth. The VECM short-run results showed a unidirectional relationship run from M2 to NOGDP. This is consistent with the supply-leading view, which states that economic growth follows financial development. Granger causality tests show that economic growth Granger-cause capital market development and vice versa when using the real GDP growth rate variables. These results are consistent with previous studies of developing countries.

A well-developed capital market will lead to economic growth and vice versa. The Saudi capital market should develop through increases in the number of listed companies and the free-float shares ratio, as well as the shift towards financial and corporate invertors' market orientation. The banking sector needs to focus on more small and medium business lending, with less shareholders' concentration. These improvements will strengthen the role of the private sector to shift the Saudi economy into sustainability away from an oil-based economy.

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