Long Term Economic Growth in Oil-Rich Saudi Arabia: What is the role for non-oil sectors?

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ABSTRACT

As a depletable resource, oil is a useful source of economic growth, but may not be relied upon for long-term sustainable development. Diversification from oil is needed to achieve this. This paper examines the most important non-oil determinants of growth in the Saudi economy between 1970 and 2011, using the Johansen approach and error correction modelling, to study the relationship between all variables, both long and short-run. It focuses on the role of non-oil sectors, given the government's determination to reduce dependence on oil income. The study uses exports, government spending, private and public investment, religious tourism, labour and capital as independent variables, while economic growth is addressed as the dependent variable. Empirical results show that all variables are important in the growth of the Saudi economy except non-oil exports, which do not have a significant effect on economic growth. Religious tourism's role was not found to be significant in the process of economic growth, when the economy as a whole was taken into consideration. Nonetheless, when isolating the non-oil sectors, the effect of religious tourism had a greater influence on economic growth. Concrete evidence also exists as to the importance of the role of an additional variable - government spending — in enhancing economic growth.

1. INTRODUCTION

THE WORLD TODAY IS WITNESS to significant interest in the vicissitudes of economic growth. It is one of the major macroeconomic indicators, wherein macroeconomic instability leads to many problems, notably higher inflation and national unemployment (Montiel 2011). Economic theory and empirical studies have made strong progress in enhancing our understanding of the expansion of a given economy. Some have focused on external factors affecting economic growth, while others have concerned themselves with internal factors. The majority of oil-rich countries on the other hand, have focused on a single

product (oil and its derivatives) for the most part, without trying to diversify their sources of income, nor taking into account the perils of falling prices - such as the implications of prices reaching their current (early 2015) lows of less than 50 per cent of 2014 values with the potential for further decreases (BBC 2015).

In the case of the Kingdom of Saudi Arabia (KSA), instability of world oil prices and the Saudi economy's reliance on a single product, calls for the enhancement of other revenue-generating sectors in the country's achievement of a greater level of growth and sustainable development. Saudi Arabia has to unleash the potential of non-oil sectors if it is to reduce its dependence on oil. In several studies, private investment, non-oil exports and religious tourism have been identified as sectors with huge potential to enhance economic growth (Khan and Reinhart 1990; Al-Yousif 1997; Schubert *et al* 2011). Religious Tourism, for example, has experienced tremendous growth in terms of the number of tourists visiting Saudi Arabia. It reached its highest ratio in the Middle East region in 2011, according to The World Tourism Organization (2012), along with an unparalleled growth in non-oil exports. The role of private investment increased steeply; the contribution of the private sector in Gross Domestic Product (GDP) in Saudi Arabia, at constant prices, reached slightly more than 58 per cent, based on the Ministry of Planning for the year 2012. Nonetheless, in oil-rich countries (most prominently Saudi Arabia) there is very limited empirical evidence concerning the relationship between oil and non-oil factors and economic growth. Saudi Arabia is economically a very important country due to the fact that its significant oil stocks allow it to plug into world oil markets and monitor the stability of oil prices; hence, the importance of economic stability in Saudi Arabia concerns not only Saudi Arabia but the whole world.

Indeed there have been numerous studies on economic growth but this study is significantly different in four key areas. First, while most studies investigating the determinants of economic growth have focused on few variables only (Prochniak 2011), each depending on its focus (for example, Piazolo 1995; Anaman 2004; Asseery and Al-Sheikh 2004; Kogid *et al* 2010), the present paper adopts a novel comprehensive approach, including 12 variables proven to be the most important determinants of economic growth in oil-rich countries, with a focus on important and neglected variables in the non-oil sectors. Second, this paper is the first study that tests analytically the effect of religious tourism on economic growth. We choose Saudi Arabia as its tourism is largely based on religious aspects. We illustrate the key contribution of this new variable in economic growth, which may inform potential studies in other countries with tourism characterised by religious aspects, such as Italy and Iran. Third, to the authors' knowledge this is the first study that examines both oil and non-oil sectors simultaneously, using the Johansen approach, for the period 1970-2011. Finally, our study opens the door to future studies on oil-producing countries using three models to test other important variables.

The rest of the paper is organised as follows: the literature review, followed by a section on the method of study, the empirical results and discussion and, finally, the conclusion.

2. LITERATURE REVIEW

Historically, two key economic theories, the Solow-Swan model, and the New Growth Theory of Romer and Lucas, have formed the basis for most studies on economic growth. The Solow model is one of the most important contributors to modern economic theory; its goal is to identify and evaluate basic factors influencing economic growth. The Solow model began with a normal production function, which depends on labour, capital and technical advances (Solow 1962) and was later expanded to a) incorporate other variables such as: savings, population growth, investment and technical progress and b) examine how this in turn impacted on living standards and economic growth. On the other hand, Romer (1986) and Lucas (1988) developed a theory of endogenous growth, which concentrated on the stock of human capital, technological advances, trade and government policies. The essential characteristic of this model is that it links technical progress directly to productivity and economic growth, rather than to labour and capital. However, most studies in both developed and developing countries rely on the expanded Solow model (Anaman 2004). Rao and Cooray (2012) in their study on the most suitable form for developing countries, confirm that the expanded Solow model is the best model in the case of less developed countries.

According to these theoretical discussions, empirical studies have attempted to identify the important factors for economic growth. Nonetheless, this analysis has two main problems: 1) there are a large number of different variables which impact on economic growth and 2) each country has its own specific conditions (Piazolo 1995). Whilst following these empirical studies, and taking into consideration these problems, the factors which impact economic growth in Saudi Arabia were selected by focusing mainly on the key determinants of economic growth in non-oil sectors. These factors are: exports, tourism and private investment.

Exports, has been found to be one of the primary determinants of growth in both oil and non-oil sectors, by many empirical studies (see for instance, Tyler 1981; Chow 1987; Asseery and Al-Sheikh 2004; Harvie and Pahlavani 2006; Kogid *et al* 2010; Tiwari 2011) and by several theories (including the Mercantilist, Classical and Keynesian growth models), all of which argued that trade plays a vital role in economic growth.

Several analysts argue that the relationship between exports and economic growth depends mainly on the export-led growth (ELG) hypothesis (for example, Al-Yousif 1997; Awokuse 2007), and they utilise this hypothesis to assess the effect of exports on economic growth. The empirical studies also argue that exports contribute positively to growth on several fronts, including through the provision of foreign exchange, technology transfer and diffusion of

knowledge, as well as enhanced efficiency by means of improvements in the skills of workers. The current analysis tests the validity of this hypothesis for the Saudi economy, which is based mostly on oil and its derivatives.

In this framework, studies addressing the determinants of economic growth in oil-producing countries have tended to focus on the exports variable (see, for example, Anaman 2004; Asseery and Al-Sheikh 2004; Konya 2004). Tuwaijri (2001) examined the causal relationship between economic growth and exports in the Kingdom of Saudi Arabia for the period 1969 to 1996. Government spending was incorporated in the analysis; evidence showed that the Kingdom's oil exports led to increased government spending, which positively and significantly impact on economic growth. The study found the presence of bilateral causality between economic growth and exports, although the impact of exports on growth was stronger than the impact of growth on exports. Furthermore, the inclusion of the government spending variable increased considerably the strength of the causal relationship between growth and exports. Thus, this study supports other studies conducted in oil-producing countries, in terms of the importance of exports in the process of economic growth. It also provides concrete evidence of the importance of the role of government spending on economic growth. Therefore, the following hypothesis is proposed:

H1 — exports have a positive effect on economic growth.

More recently, researchers have shown a great interest in the relationship between tourism and economic growth. Several studies (see Belisle and Hoy 1980; Davis and Consenza 1988; Sequeira and Maçãs Nunes 2008; Tiwari 2011) show that tourism has a positive effect on long-term economic growth. Tourism is argued to be a good source of foreign exchange for both developing and developed economies; and also leads to employment creation, which contributes further to income generation, in addition to tax revenue.

Most studies that address this tourism-led growth hypothesis (TLG) are underpinned by the export-led growth hypothesis (ELG) (see Balaguer and Cantavella-Jordà 2001; Cortes-Jimenez and Pulina 2010; Jayathilake 2013). This hypothesis is based on the premise of the movement of consumers rather than goods and thus considers international tourism to be a genuine strategy for economic growth. Currently, many low-income countries and developed countries adopt economic policies encouraging international tourism, which is asserted to be a potential source of economic expansion.

Several empirical studies have examined the role of tourism: Heng and Low (1990) for Singapore, Katircioglu (2009) for Turkey; Chen and Chiou-Wei (2009) for Taiwan and Korea; Schubert *et al* (2011) for small island economies and Chatziantoniou *et al* (2013) for France, Italy, Spain and Greece. However, not all of these studies have found evidence of the long-term positive effects from this sector. As far as oil-rich countries are concerned, Brau *et al* (2007) consider tourism to be very important. Following the results of an empirical

analysis of data from 143 countries between 1980 and 2003, they concluded that countries that depend on tourism tend to grow faster than oil-producing countries. However, most studies carried out in oil-rich countries have ignored the importance of this variable. In Saudi Arabia, for example, Asseery and Al-Sheikh (2004) examined the determinants of economic growth between 1964 and 2001. They used military spending, financial sector development, exports, government spending, labour and investment as their independent variables and found that all variables except investment were important determinants of economic growth in the country. The study further noted that oil exports seemed to have the strongest correlation to this growth — greater than all of the other factors combined.

Nonetheless, their exploration into growth in Saudi Arabia suffered from some fundamental shortcomings. For instance, they ignored important variables in non-oil sectors such as non-oil exports, private investment and religious tourism. The last of these, religious tourism, is a non-depleting resource that the governments of such countries could invest enormous amounts of oil-revenues into. Statistics from the United Nations World Tourism Organisation (UNWTO) suggest that the KSA had the highest number of tourists in the Middle East, amounting to over 17 million in 2011 (World Tourism Organization 2012). As a result, it can be established that KSA, along with being an oil exporter, has a promising tourism market, in particular because of the two holy mosques of Makkah and Medina. Thus, the next hypothesis is proposed as:

H2 — Religious tourism has a positive effect on economic growth.

Similarly, there have been considerable debates between researchers on the relationship between private investment and growth. A significant number of researchers have concluded that private investment has had a positive influence on economic growth (see for example, Serven and Solitnano 1992; Khan and Kumar 1997; Al-Jundi and Hijazi 2013; Alshahrani and Alsadiq 2014). These empirical studies indicate that there is a positive relationship between private investment and economic growth working through several channels, the most important of which is to provide employment for citizens and stimulate productivity.

A study by Khan and Kumar (1997) explored the impact of private and public sector investment on growth in developing countries using a cointegration approach. The results reflected the fact that private investment has a much larger impact than public investment. A recent study by Alshahrani and Alsadiq (2014) also examined the effect of several factors on economic growth, including private and public investment. The authors discovered that there was a positive impact from both private and public investment on the Saudi economy. Consequently, empirical studies support the concept that private investment has a positive effect on economic growth. From this perspective, this analysis tests the validity of this hypothesis for the Saudi economy.

Hence, the last hypothesis proposed is:

H3 — private investment has a positive effect on economic growth.

It is important to note that religious tourism, private investment and non-oil exports are not necessarily the only factors affecting economic growth in the KSA and similar countries, but are the most important following previous empirical studies discussed above. Additional variables considered to be important determinants of economic growth in oil-rich countries include: government spending (for example, Anaman 2004; Asseery and Al-Sheikh 2004; Safdari *et al* 2011), labour and capital (following the neoclassical production function). Consequently, this paper aims to examine a specific subset of these variables in the KSA, with a particular focus on the main non-oil sectors.

3. METHOD OF STUDY AND MODEL SPECIFICATION

3.1. Method of study

Time series data are from several sources, namely: the International Monetary Fund database (IMF), the Saudi Arabian Monetary Agency 'Central Bank' (SAMA), the Saudi Commission for Tourism and Antiquities (SCTA) and The United Nations World Tourism Organization (UNWTO). All data were transformed into natural logarithms and variables have been calculated in real terms (US dollars), using the GDP-deflator (1999 = 100). The data consist of 41 (annual) observations over the period 1970 to 2011.

The methods of analysis employed are based on those used by Piazolo (1995), Awokuse (2007) and Katircioglu (2009), beginning with the stationary tests for Augmented Dickey-Fuller (ADF) (Dickey and Fuller 1981) and the Phillips-Perron (PP) (Phillips and Perron 1988) test for unit roots. The Johansen method for cointegration (Johansen and Juselius 1990) was applied to test the relationship between independent variables and economic growth (GDP) in the long-run as well as the Error Correction Model (Engle and Granger 1987), to test the relationship between all variables in the short-run.

A unit root test is imperative in identifying whether time-series data are stationary or not. The procedure is important in order to avoid the problem of spurious regression (Gujarati 2011), and is necessary to the conversion of the data into a form that satisfies the stationary condition before starting the analysis. There are a number of methods used to test the stationarity of time series, as represented in: Dickey Fuller (DF), Augmented Dickey-Fuller (ADF), Philips-Perron (PP), Kwiatkowski-Phillips-Schmidt-Shin (KPSS) and Ng-Perron (NP) (Kogid *et al* 2010).

The ADF and PP unit root tests will be presented. These have been extensively used in numerous studies (see for example, Piazolo 1995; Kogid et al 2010). Piazolo (1995) confirmed that there are three important tests of integration to apply, ADF and PP being the most important. After the unit root tests for ADF and PP, it is necessary to ensure that time-series variables are integrated of order one. The cointegration test of the Johansen approach will,

therefore, be conducted between GDP and the independent variables to verify the existence of a long-term relationship between GDP and its most important determinants. Two criteria in the Johansen approach are λ-trace and λ-max. The Johansen test relies on the estimation of the Vector Autoregressive Model (VAR) that assumes the existence (p) of economic variables in the vector of regression of K-class, using the following equation:

$$\Delta X_t = \mu + \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + -...\Gamma_{k+1} \Delta X_{t-p+1} + \pi X_{t-1} + \varepsilon_t$$

where X_t = (k x1) stochastic variable vector, μ_t = (k x1) constant vector, π and $\Gamma_{1,} \Gamma_{2,}...\Gamma_{k+1}$ = (k x k) parameter matrices and ε_t = (k x1) random vector.

With regards to the short-term relationship, if the variables are cointegrated, following the Johansen test, the study will employ Vector Error Correction Models (VECM) derived from the VAR to examine the short-term relationship between the economic growth (GDP) and the selected variables in all three models.

3.2. Model specification

In studying the effect of selected variables on growth, the analysis utilises the widely used expanded neoclassical production function (see for example, Barro 1991; Mankiw *et al* 1992), which includes several variables, such as human capital and government spending. Thus, the neoclassical production function can be written as follows (Odedokun 1997):

$$Y=Af\ (K,\ L;\ Z)$$

Where:
(1)

Y = economic growth (GDP);
A = technological;
K = capital;
L = labour force;
Z = a vector of other relevant variables.

Saudi Arabia and other economies that are oil-export based rely on external influences in determining prices. They then inject these earnings into the economy via government spending. Hence, in order to access the determinants of economic growth in the context of an economy based on the extraction of a natural resource such as oil, the econometric models will derive from the extended neoclassical production function as indicated in equation (2):[2]

$$Y=F\ [(K,\ L);\ X,\ G,\ T]$$
(2)

where additional variables, X, G and T are total exports, government spending and religious tourism respectively.

Overall, the existence of the oil sector in oil-rich economies, with its domination of the economy (which is greatly different in nature to the non-oil

sector), makes it necessary to divide the economy into two major sectors: oil and non-oil. In order to achieve the objectives of the study, some of the variables in equation (2) are revised as follows:

  • Three main types of exports (X): total exports (X_T), oil exports (X_O) and non-oil exports (X_N).
  • Following Khan and Reinhart (1990) as well as Odedokun (1997), capital is divided into public (P_{GN}) and private (P_{IN}) in the non-oil sector.

To address its aim, this paper estimates three different models: 1) the main model, which reflects the whole economy, 2) the oil sector and 3) the non-oil sector. Thus, the empirical formulations of the extended production function (2) are as follows:

Main model

$$\ln Y_1 = \alpha + \beta_1 \ln L_T + \beta_2 \ln K + \beta_3 \ln X_T + \beta_4 \ln G + \beta_5 \ln T + \varepsilon \qquad (3)$$

Oil sector model

$$\ln Y_2 = \alpha + \beta_1 \ln L_O + \beta_2 \ln K_O + \beta_3 \ln X_O + \beta_4 \ln G + \varepsilon \qquad (4)$$

Non-oil sector model

$$\ln Y_3 = \alpha + \beta_1 \ln L_N + \beta_2 \ln PG_N + \beta_3 \ln PI_N + \beta_4 \ln X_N + \beta_5 \ln T + \varepsilon \qquad (5)$$

where Y_1 is real GDP, Y_2 is real GDP in the oil sector, Y_3 is real GDP in the non-oil sector; X_T, X_N and X_O are exports variables (total, oil-exports and non-oil exports, measured by real values); T is religious tourism (measured by the total number of tourist arrivals, including Hajj and Omrah); G is government spending (measured by real government consumption expenditures, except soft government loans granted to the private sector); PI_N and PG_N are private and public investments in non-oil sectors, measured by gross private fixed capital formation in the non-oil sector (in real terms) and gross public fixed capital formation in the non-oil sector (in real terms); K and K_O are capital and oil-investment, measured by total gross fixed capital formation (in real terms) as a proxy of capital and gross public fixed capital formation in the oil sector (in real terms); whereas L_T, L_O and L_N are labour force variables (measured as total, employees in the oil sector and the non-oil sector, respectively). All time-series data are converted to natural logarithms.

4. DESCRIPTION OF VARIABLES

• *Gross domestic product* (GDP) (Y)
Saudi GDP is our dependent variable, denoted by (Y).

• *Labour* (L)
This variable plays a vital role in economic growth according to many theories,

as discussed previously. However, the labour force in oil-rich countries (such as KSA) is concentrated in non-oil sectors, according to the KSA Ministry of Planning and Central Bank. As per the neoclassical growth theorists, the labour variable must be included in this model. It is expected that labour will have a positive relationship with economic growth.

Labour can be measured in different ways, depending on data availability: the size of the labour force, number of hours worked, schooling years and the population size. In this study the size of the labour force is used for our analysis, given that this information is readily available, and following previous studies (see, for example, Anaman 2004; Teixeira and Fortuna 2003; Awokuse 2007).

• *Exports* (*X*)
Petroleum exports play a major role in determining economic growth in oil-rich countries, particularly in Saudi Arabia, but the fluctuation of oil income together with the lack of diversity of income sources may have a negative long-term impact on the rate of economic growth. In Saudi Arabia, for example, the contribution of exports to total GDP has increased, as the greatest percentage of the country's exports are oil-related, constituting about 90 per cent of the total export earnings; non-oil exports account for the remaining percentage. Such a situation makes GDP and Saudi economic performance more sensitive to any changes in international economies. Based on the hypothesis that exports play a leading role in growth, it is expected that exports, both oil and non-oil, will have a positive impact in all three economic growth models.

• *Government spending* (*G*)
Government spending is strongly influenced by monetary policy in oil-rich countries. If it is competently managed it is capable of strengthening economic growth and its sustainability, improving social welfare and raising standards of living. Government spending in Saudi Arabia includes the procurement of goods and different services such as security and defence, health, education, public sector staff salaries and others. It does not include transfers and various subsidies provided by the State to the private sector. Government spending is expected to have a positive impact on economic growth (Dash and Sharma 2008; Kogid et al 2010; Nurudeen and Usman 2010).

• *Private investment* (*PI*)
Private investment is an important pillar of Saudi Arabia's economic growth. It is an important component of total demand and GDP. The government of Saudi Arabia has taken a number of actions to enhance the role of private investment, through low-yielding loans and direct and indirect subsidies. It is expected that the impact of private investment on the Kingdom's economic growth will be positive, especially in the non-oil sector (Serven and Solitnano 1992; Khan and Kumar 1997; Alshahrani and Alsadiq 2014).

• *Public investment* (*PG*)

Public investment in the Saudi economy is very important. It can improve levels of development, promote business growth and increase productivity. Like private investment, it can lead to an increase in the accumulation of physical capital and thus stimulate economic growth. That said, the overall effect of public investment on economic growth in Saudi Arabia could be positive or negative (Khan and Kumar 1997; Tanzi and Davoodi 1998), as investment in the public sector of Saudi is not necessarily motivated by profit.

• *Religious tourism* (*T*)

Tourism is the most controversial factor in recent studies on economic growth. Saudi Arabia is attempting to diversify its sources of income and resolve its almost complete dependence on oil, through direct investment in the tourism industry, be it international tourism or religious tourism.[3] Religious tourism is expected to carry a positive impact on economic growth in Saudi Arabia. There are numerous of indicators to measure this, including tourist arrivals, tourist receipts and the number of nights spent by tourists in the country. This study uses tourist arrivals, as these have already been successfully and extensively utilised in previous works (Jayathilake 2013). Tables 1 and 2 contain summaries of the hypothesis and the descriptive statistics of the variables.

Table 1: Hypotheses			
Explanatory variables	*Symbols*	*Hypothesis*	*Expected sign*
Capital	K, K_O	Gross fixed capital formation and investment in the oil sector positively affect economic growth.	+
Labour force	L_T, L_O, L_N	The labour force in three models positively affects economic growth.	+
Exports	X_T, X_O, X_N	Exports in the three models positively affect economic growth.	+
Private investment	PI_N	Private investment in the non-oil sector positively affects economic growth.	+
Public investment	PG_N	Public investment in the non-oil sector has a mixed effect (positive and negative) on economic growth.	+/-
Government spending	G	Government spending positively affects economic growth.	+
Religious tourism	T	Religious tourism positively affects economic growth.	+

Table 2: Descriptive statistics of the variables							
	GDP	*GDP_O*	*GDP_N*	*G*	*K_O*	*K*	*PG_N*	*PI_N*
Std. Dev.	0.408276	0.300556	0.596595	0.584971	0.506216	0.485156	0.839079	0.812113
Skewness	-1.609558	-1.057865	-1.865849	-1.919784	-1.195018	-1.473710	-0.569442	-1.439257
Kurtosis	6.236814	3.050656	6.657689	5.688582	4.482432	5.561474	2.692085	5.447174
Sum	484.8687	444.1415	464.1138	425.7885	321.5911	421.3028	376.2585	391.1865
Sum² Dev	6.667557	3.613365	14.23704	13.68762	10.25017	9.415048	28.16213	26.38111
Obs.	41	41	41	41	41	41	41	41

	L_T	L_N	L_O	X_N	X_O	X_T	T
Std. Dev.	0.485179	0.530403	0.525970	0.796311	0.335842	0.532246	0.822892
Skewness	-0.662180	-0.356197	-0.467947	-0.146655	-0.975430	-0.163593	0.459599
Kurtosis	2.126065	2.013406	1.832262	2.979104	3.182963	2.518557	1.869469
Sum	343.0865	344.0903	158.6822	363.6918	440.2532	451.4858	332.6735
Sum² Dev	9.415964	11.25310	11.06576	25.36445	4.511606	11.33143	27.08608
Obs.	41	41	41	41	41	41	41

5. EMPIRICAL RESULTS AND FINDINGS

5.1. Unit root tests

The Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) unit root tests are presented in Table 3. The ADF tests suggest that all selected variables are

Table 3: Tests for unit root (ADF and PP tests)								
	ADF tests at first difference				*ADF tests at first difference*			
	Intercept	*Lags*	*Intercept and trend*	*Lags*	*Intercept*	*Lags*	*Intercept and trend*	*Lags*
ln GDP	-4.391**	8	- 4.518**	8	- 2.512	4	-2.431	3
ln GDP_O	-3.561**	8	-3.649**	8	-4.946**	0	-4.857**	1
ln GDP_N	-3.385**	2	-7.037**	4	-2.074	8	-2.400	5
ln L_T	-8.962**	0	-9.023**	0	-9.013**	1	-9.023**	0
ln L_O	-5.752**	0	-4.490**	3	-5.754**	2	-5.790**	4
ln L_N	-3.960**	0	- 4.139**	0	- 3.955**	2	-4.112**	1
ln K	-6.959**	0	-4.875**	1	-6.944**	6	-6.847**	6
ln K_O	-7.547**	1	-7.437**	1	-8.298**	13	-7.624**	12
ln PI_N	-3.879**	1	- 4.055**	1	- 3.857**	6	-4.116**	5
ln PG_N	-3.804**	0	- 3.766**	0	- 3.868**	3	-3.851**	3
ln X_T	-4.137**	0	-3.696**	1	-4.052**	2	-3.935**	2
ln X_N	-6.111**	0	-4.306**	4	-6.726**	8	-11.079**	15
ln X_O	-5.321**	0	-5.370**	0	-5.232**	1	-5.376**	1
ln G	-7.381**	0	-8.122**	0	-7.289**	4	-8.141**	2
ln T	-5.291**	0	-4.827**	1	-5.206**	5	-5.154**	8

*Significance at 10% and ** significance at 5%. The lag length is based on the Akaike Info Criterion (AIC) for ADF and Newey-West Bandwidth for PP.

integrated of order I(1). The PP test indicates that two dependent variables are integrated I(0). This study utilises the results of the ADF test as the basis for a cointegration test, as the PP-test performs better with large samples than the smaller sample of this study (Davidson and MacKinnon 2004). In the Augmented Dickey Fuller (ADF) test, the gap was determined by the Akaike Information Criterion (AIC), while the Newey-West standard was utilised in the Phillips-Perron (PP) tests.

5.2 Co-integration test
The results of Johansen's cointegration test are presented in Table 4. They show that there are, respectively, one, two and three cointegrating vectors between GDP growth and other variables in all three models, using the lag length determined by the AIC. The Johansen approach is sensitive to lag length; hence, optimal lag-length must be selected. Consequently, the existence of a long-term relationship between economic variables becomes apparent.

		Model (I)	Model (II)	Model (III)
H_0	H_1	Trace statistics: λ–trace		
r=0	r >0	117.0971*	80.52109*	195.5705*
r $\leq$ 1	r >1	65.47119	42.21529*	100.1677*
r $\leq$ 2	r >2	40.57395	16.25504	59.79529*
r $\leq$ 3	r >3	23.84954	6.239517	25.59655
r $\leq$ 4	r >4	11.50454	0.000019	4.594693
r $\leq$ 5	r >5	0.001841	0.000000	0.220659
		Eigen statistics: λ–max		
r=0	r =1	51.62596*	38.30579*	95.40278*
r $\leq$ 1	r =2	24.89724	25.96025*	40.37239*
r $\leq$ 2	r =3	16.72441	10.01552	34.19874*
r $\leq$ 3	r =4	12.34500	6.239498	21.00186
r $\leq$ 4	r =5	11.50270	0.000019	4.374033
r $\leq$ 5	r =6	0.001841	0.000000	0.220659

Table 4: Johansen Cointegration Test Results

Estimated Long-Term Coefficients Johansen Aproach

Variable	Coefficient	Variable	Coefficient	Variable	Coefficient
LL_T	0.209583(4.96)	LL_0	-0. 004755(-0.06)	LL_N	0.165653(3.36)
LK	0.274168(7.71)	LK_0	0.225699(4.00)	LPI_N	0.179269(3.91)
LG	0.116647(3.14)	LG	0.197766(2.71)	LPG_N	0.080012(5.09)
LX_T	0.218725(7.72)	LX_0	0.642599(8.81)	LX_N	0.050321(1.38)
L_T	0.004250(0.21)	--	--	LT	0.145523(2.96)

* Rejection of the null hypothesis of no co-integration at 0.05 level.
Notes: * denote significant at the 5% level. t-Statistics in parenthesis.

The equation for cointegration between economic growth and the independent variables in all three models can be seen in the lower panel of Table 4, which reveals the dominance of total exports on economic growth. It also shows the failure of the religious tourism variable to enhance economic growth in the main model. In the oil-sector growth model, as expected, oil exports was the most important variable, followed by investment in the oil sector and government spending, while private investment was the primary factor affecting economic growth in the non-oil sectors in terms of the magnitude of the estimated coefficients. Religious tourism and investment in the public sector were second and third respectively in the latter model, while exports did not have a significant effect.

5.3 Error correction model

The above results find long-run relationships between economic growth and its determinants. Consequently, the next step is to examine the relationship between these variables in the short-run. The results are shown in Table 5.

Table 5: Error Correction Model for Saudi Arabia

Variables	Model (I)		Variables	Model (II)		Variables	Model (III)	
	Co.	t-St.		Co.	t-St.		Co.	t-St.
EC_{t-1}	-0.49	-3.74	$*EC_{t-1}$	-0.39	-2.15	$**EC_{t-1}$	-0.53	-3.86
D ($LGDP$(-1))	0.39	1.84	D ($LGDP_O$(-1))	0.49	1.53	D ($LGDP_N$(-1))	-0.05	-0.26
D (LL_T(-1))	0.01	0.18	D (LL_O(-1))	-0.53	-1.81	D (LL_N(-1))	-0.14	-0.78
D (LK(-1))	-0.08	-2.32	D (LK_O(-1))	0.08	1.30	D (LPG_N(-1))	0.01	1.01
D (LG(-1))	0.06	1.29	D (LX_O(-1))	-0.41	-1.45	D (LPI_N(-1))	0.09	1.64
D (LX_T(-1))	0.12	2.00	D (LG(-1))	0.05	0.35	D (LX_N(-1))	-0.01	-0.38
D (LT(-1))	-0.02	-0.49	C	0.35	1.31	D (LT(-1))	-0.10	-2.15
C	0.01	1.83	-	-	-	C	0.11	4.67
R-squared	0. 69		R-squared	0.27		R-squared	0.96	
F-statistic	9.35		F-statistic	1.71		F-statistic	24.17	

where: D refers to the first differences; EC_{t-1} is the error correction term; *Co.* is coefficient and *t-St.* is the t-statistic. $*EC_{t-2}$ = (*t-St.* is 2.08) ** EC_{t-2} and EC_{t-3} = (*t-St.* are 4.06 and 2.01 respectively).

The results in Table 5 indicate that total exports (X_T) is the main determinant of economic growth in the first model, both in the short and the long-term, whereas other variables are found to differ in their short and long-term impacts. Although government spending (G), total labour force (L_T), investment in oil sector (K_O), private investment (PI_N) and public investment (PG_N) are positive and statistically significant in the long-term estimated equations (Table 4), they were not significant in the short term. Labour force in the oil sector (L_O) also has a negative, but insignificant, influence in the short and long term.

With regards to the estimated coefficient for the error correction term (EC_{t-1}), in all three models the short-term relationship between the dependent and the independent variables is negative and statistically significant, consistent with the method of error correction (see Table 5).

6. DISCUSSION OF THE RESULTS

The study illustrates the importance of exports to economic growth, as suggested by both theory and existing empirical evidence. In Saudi Arabia the impact of the oil-sector is highly prominent. This is evident when the economy is divided into two parts (oil and non-oil) with estimated results showing that oil exports are in fact responsible for this growth, whereas the impact of non-oil exports on economic growth is not significant. Religious tourism performs below expectations in the main model. Nonetheless, our findings confirm its importance in the non-oil economy. It is found that private investment in the non-oil economy has the greatest positive impact on economic growth, followed by religious tourism and public investment respectively.

The results thus substantiate prevailing economic theories and support the majority of applied studies, as they show that exports (total and oil-exports), government spending, and public and private investments have a positive impact on economic growth (see for example, Tuwaijri 2001; Anaman 2004; Asseery and Al-Sheikh 2004; Dash and Sharma 2008; Kogid *et al* 2010; Nurudeen and Usman 2010; Safdari *et al* 2011; Trpkova and Tashevska 2011).

With regard to non-oil exports, some studies have found that their impact on economic growth and performance is weak and less than expected (see, for example, Mahdavi 2007; Adenugba and Dipo 2013). The results of the present study support this. Aljarrah's (2008) research into Saudi Arabia and Olayiwola and Okodua's (2013) work on Nigeria both identify a positive relationship between non-oil exports and economic growth. However, other studies have shown a negative relationship with economic growth, for example in Iran, another oil-rich country (Tabari and Nasrollahi 2010). These differences, all for oil-rich countries, may be due to the different methodologies used, or maybe they support the assertion that non-oil exports have an unpredictable impact on economic growth in oil-rich countries.

With regard to religious tourism, these findings give strong support for an unprecedented positive impact of religious tourism on the Saudi economy. They support most of the empirical studies (such as Brau *et al* 2007; Schubert *et al* 2011; Tiwari 2011), which posit that tourism in general has a positive impact on economic growth. However, these studies did not consider religious tourism specifically, perhaps because of an absence of tourism of this type in the countries investigated. Hence, our study is among the first, if not the first, to examine the impact of religious tourism on economic growth, thereby extending our understanding of the relationship between tourism and economic growth, especially in oil-rich countries.

7. CONCLUSIONS

The aim of this paper has been to identify and examine the main factors of economic growth in Saudi Arabia, focusing mainly on key variables in the non-oil sectors of the economy. The Augmented Dickey Fuller (ADF) unit root tests showed that the data used for each variable are integrated of order one I(1), which gave the possibility of conducting cointegration analysis in seeking to answer the primary research questions of the paper.

The main contribution of this paper is to illustrate the importance of non-oil channels such as private investment, religious tourism and non-oil exports as a future strategy for long-term sustainable growth for oil-rich countries, particularly for Saudi Arabia. Moreover, it highlights the importance of separating the economy in oil-rich countries into two parts, oil and non-oil, when examining issues relating to economic growth.

This study has uncovered the fact that oil exports have the greatest effect on economic growth, followed by investment in the oil sector and government expenditure - a logical finding, especially in oil-rich nations where oil or gas exports dominate. This study has also revealed private investment as having a strong impact on economic growth in non-oil sectors in addition to religious tourism and public investment. However, non-oil exports are less important; this means that the current growth rates of non-oil exports in the Saudi economy are not sufficiently strong economically, in the absence of a strong oil sector.

This study's results have also reiterated the positive impact of the labour force and capital on economic growth. This is consistent with economic theory, except in the case of workers in the oil sector. The religious tourism factor yields results that are below expectations when considering its impact on the whole economy, putting into context its efficiency and effectiveness in supporting the economic growth of Saudi Arabia. This does not mean it should be ignored; rather it should be supported if the desired economic results are to be achieved, especially with regards to diversification and expansion of non-oil sectors of the economy. This study also provides tangible evidence that, with the exception of the labour force in the oil sector, most of the variables had a stronger influence in the long term than the short term.

In summary, if the Saudi economy is to catch up with the economies of other more advanced nations, the country must focus on important variables in non-oil sectors such as private investment and religious tourism for multiple reasons, not the least of which is the fact that these sectors are far easier to control. Hence, there are two implications of this paper, both theoretical and practical.

As far as the theoretical side is concerned, the religious tourism sector is postulated to be a new determinant in economic growth theories. An attempt has also been made to isolate each sector separately in oil-rich countries (i.e. the oil and non-oil sectors). The present study has revealed and highlighted the potential role of the main non-oil sectors, in particular religious

tourism and private investment, as decisive future factors available to promote economic expansion for petroleum-exporting countries (for example, Iraq and Iran).

With regard to practicality, the outcomes in general inform policy-makers in countries that depend on a single product such as oil and the Saudi government in particular, of the key sectors to focus on if they wish to ensure sustained economic growth. Highlighting private investment as well as religious tourism as future engines for economic expansion permits policy-makers in Saudi Arabia to grasp the prudence of strengthening these two sectors. This may be accomplished through primary measures such as infrastructure development, speeding up the privatisation process and facilitating the process of obtaining visas. Thus, the Saudi government is encouraged to focus on the factors and variables affecting the non-oil sector in order to promote its development, rather than continuing to rely upon massive oil revenues. The oil sector cannot be considered a dependable economic pillar, as its status is determined so decisively by international markets and global conflicts; it is difficult for any country to control or predict a future based on oil. We posit that the process of economic growth in Saudi Arabia (as an emerging-market/developing country and an OPEC member) needs to focus on long-term variables.

Finally, the most valuable contribution of this study is that it modifies understanding of the nature of economic growth in oil-producing countries. Previous studies failed to separate the nature of an economy into oil and non-oil sectors and detach it from the whole economy. The three models that have been utilised can broaden our understanding of the economic factors that influence economic growth in those oil-rich countries that have similar characteristics to the Saudi economy, such as Iran and Iraq.

The literature review has been extended by incorporating new economic variables on economic growth (such as religious tourism) in order to give more profound insights into the relevance of these variables for economic growth, and the results relating to the non-oil sectors are of great importance to the drawing-up of future policies. There is a considerable overlap between these two sectors (oil and non-oil) and it may be difficult to separate them completely. Nevertheless, this study opens the door to other studies exploring oil-producing countries by means of the three models used here. Future researchers can now test other important variables in oil-producing countries and can further endorse the assertion that oil-producing countries need new, independent theories, especially in the oil sector.

ENDNOTES

1. Graduate School of Management, Plymouth University, PL4 8AA, United Kingdom. E-mail: ahmed.alodadi@plymouth.ac.uk; james.benhin@plymouth.ac.uk. The authors would like to thank the Editor as well as two anonymous referees for very helpful comments and valuable suggestions. Any remaining errors or omissions are entirely the authors.

2. Government spending is included in two equations (the Main Model and Oil Sector) because it is significantly influenced by revenues from oil exports (for example, Tuwaijri 2001; Anaman 2004; Safdari *et al* 2011). However, it is not included in the Non-Oil Sector as the study aims to isolate any effect of the Oil Sector.

3. Religious tourism is a kind of tourism wherein people travel for religious reasons to Omrah on a pilgrimage or as a missionary (Shinde 2008). The largest type and most important form of religious tourism in the world is the Hajj pilgrimage in Makkah (Aziz 2001).

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