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THE ROLE OF THE ENTERTAINMENT INDUSTRY IN
ACHIEVING SUSTAINABLE ECONOMIC GROWTH: THE CASE
OF SAUDI ARABIA

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Abstract

This study attempts to explore the main causes of economic instability in Saudi Arabia. In addition, we investigate the significance of nonoil exports, industrialization, technological development, tourism and the entertainment sector in attaining sustainable economic development. The findings confirm the significant and positive coefficient for nonoil exports, industrialization and entertainment sector, while oil exports have reported a negative impact on the long-run economic growth of Saudi Arabia. In brief, it is recommended that Saudi Arabia transform its economic policies to attain sustainable economic development by shifting its dependence from oil exports to other economic sectors.

JEL CLASSIFICATION: L82; O1

KEYWORDS: SAUDI ARABIA; NONOIL EXPORT; TOURISM; ENTERTAINMENT; SUSTAINABLE ECONOMIC GROWTH

1. Introduction

The 2014 collapse in oil prices is one of the largest oil-price shocks in modern history. The decline in oil prices was caused by rapid efficiency gains in U.S. shale oil production, a shrinkage effect of geopolitical risks, the inability of the Organization of Petroleum Exporting Countries (OPEC) to regulate global oil supply, and reduction demand prospects. Among oil-exporting countries, those with more diversified economies and larger fiscal

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buffers fared better than others. However, limited prospects of a substantial recovery in oil prices from current levels could have lasting implications for potential growth in oil exporting countries.

Saudi Arabia is one of the five founding members of the OPEC whose economy was affected by the sharp decline in oil prices between mid-2014 and early 2016; therefore, many serious economic problems appeared in the Kingdom. Examples included unemployment, reduction of the stock market, and low per capita income. As an oil exporting country, Saudi Arabia's unemployment levels have increased due to its heavy dependence on oil revenues and lesser dependence on other industries. Major changes in the price of oil are likely to be followed by real effects over the longer term of the stock market. In addition, experts confirm that oil price reductions substantially affect the Kingdom's GDP per capita income and have a huge impact on the standard of living of individuals in Saudi Arabia.

Figure 1. Oil exports of Saudi Arabia (billion USD)

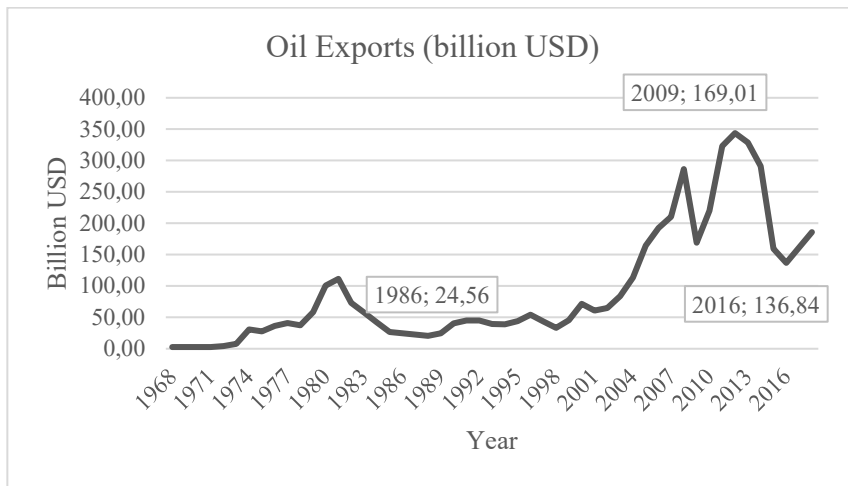
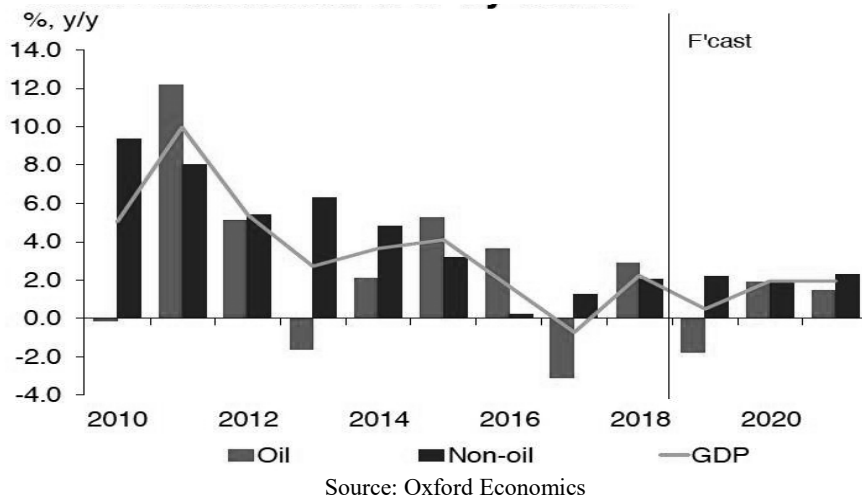


Figure 2. Saudi Arabia's real GDP different rates by sector between 2010 and 2020. In addition, the chart illustrates the Kingdom's heavy reliance, especially on the oil sector compared to nonoil sectors.



The Solow Growth (Labour and Capital) Model is the starting point for all analyses in modern economic growth theories. It focuses on long-run economic growth and attempts to explain it by examining capital accumulation, labour or population growth, noting that increases in economic prosperity are linked with labour and capital. Later, a number of researchers mentioned more factors that are important for economic growth, such as inflation, interest rate, tourism, money supply, innovation, entrepreneurship, and political stability (Alodadi and Benhin 2015, Johnson 2010, Alhawaish 2016; Sarwar et al., 2017; Shahbaz et al., 2017; Wahed et al., 2020). (Alodadi and Benhin 2015, Johnson 2010, Alhawaish 2016) have concluded that tourism and refining tourism plans have a critical role in supporting the kingdom to maintain stable economic growth in the long run and diverse nonoil sources of the economy; thus, its dependence on oil revenues gradually decreased (Khan 2013, Sabri and Hamdan 2019, Hamdan Khamis, Al Hawaj and Barone 2019) found that entrepreneurial activity development has positive effects on economic growth in Saudi Arabia. In addition, the government's role has an extreme impact in supporting the relationship between entrepreneurship and economic growth in GCC countries. In the case of the

UAE, the studies confirmed that public governance support has a significant effect on entrepreneurship programs and enhances the progress of economic development.

1.1 Contribution of study

In the case of Saudi Arabia, the country is facing multiple challenges at the same time, such as oil price decline and increase in military expenditure to fight against terrorism in Yemen. Similarly, the significant decline in tourism due to terrorism and fewer facilities in the tourism sector are also catastrophes. All these factors present an alarming situation because the annual growth rate has decreased in the past few years. Instead, Saudi Arabia has had to decrease its dependence on oil exports over time, increase non-oil exports, promote the tourism sector, and introduce industrial and entrepreneurial reforms to achieve more sustainable growth in the future. Most importantly, given the contribution of the current study, it is recommended that Saudi Arabia promote entertainment activities that have a positive impact on economic indicators, which directly and indirectly boost local tourism, develop tourism-related businesses, increase local consumption, and provide employment opportunities. Thus, this study investigates the importance of the entertainment sector for the Saudi economy to attain sustainable economic growth.

2. Literature

Alodadi and Benhin (2015) reported in their study the critical role that tourism, especially religious tourism, play in maintaining stable economic growth in the long run, as the Kingdom must diversify non-oil sources of the economy, and thus its dependence on oil revenues gradually decreases. This study used a time-series approach between 1970 and 2011 to investigate the effects of tourism on the prosperity of the economy in Saudi Arabia. The findings have indicated two positions: first, when considering the economy with all its oil and non-oil sources, tourism did not significantly affect economic growth. Second, if only non-oil resources are considered, the study confirmed the important impact of the tourism industry on the Kingdom's economic returns.

Johnson (2010) documented the critical economic risks faced by Saudi Arabia, and to counteract these risks, specific tourism training and education skills can be provided to support effective tourism to increase the country's

economy. The study reported refining and developing tourism plans to create sustainable internal tourism that interacts with different sectors of Saudi society as individuals as well as companies, depending on firm tourism plans that reinforce the Kingdom's economy.

In the case of the Gulf Cooperation Council (GCC) countries, Alhawaish (2016) reported a positive relationship between high tourism rates and economic situation improvement in GCC countries. The study used panel data for the period 1995-2012 and evaluated the impact of tourism on economic growth in GCC countries individually and collectively using a panel Granger causality analysis approach. The results showed no relationship between tourism and economic development; in the case of Kuwait, Saudi Arabia, Qatar and the United Arab Emirates, it is the economy that supports tourism in these countries, as hypothesized. For Bahrain, the hypothesis is inverted, meaning that tourism growth led to economic growth in this country.

Khan (2013) investigated the existing entrepreneurship development in Saudi Arabia. In addition, it determined that the ability to intervene stimulates the growth of entrepreneurship, which has a positive effect on the economic growth of the Kingdom. To understand the existing entrepreneurial activities and explore entrepreneurship ecosystem development, a set of various types of recourses have been used in the cross-sectional basic study. The results have confirmed that ecosystem factors assisting entrepreneurship in the Kingdom are not complete or in their early stages, especially those related to effective strategies and companies' levels that support and motivate entrepreneurship. On the other hand, opportunities are widely available, and government modifications have become common.

In a study on the GCC countries, Sabri and Hamdan (2019) focused on measuring the contribution of the government of the GCC countries to act as a link between entrepreneurship and economic growth. To determine the role of these governments, the study used a 10-year time series (2006-2015) for six GCC countries. Data were collected from The World Bank database, general statistics on the GCC, the Index from the Global Entrepreneurship and Development Institute (GEDI) and the Global Entrepreneurship Monitor (GEM) database. The findings have confirmed that the government's role has an extreme impact in supporting the relationship between entrepreneurship and economic growth in GCC countries. Risk capital and high growth are signs of a fast increase in entrepreneurial activities in these countries. On the other hand, technological knowledge and the ability to innovate indicators were found to be the lowest. In the case of the United Arab Emirates (UAE),

Hamdan, Khamis, Al Hawaj and Barone (2019) examined the intercession role of public governance between entrepreneurship and the country's economic growth. The study tests the impact of advances in entrepreneurship activities on economic growth rates through a 20-year time series analysis (1996-2015), public governance, and mediator model. The results have confirmed that public governance support has a significant effect on entrepreneurship programs and enhanced the progress of economic development in the UAE. In addition, the study proposed proposals to foster entrepreneurship activities because they have a major and effective impact on the growth of the UAE's economy.

After examining the previous literature, it has been observed that earlier studies have failed to investigate the role of the entertainment industry in economic growth. As such, to address this gap, this research examines the impact of the entertainment industry on the economic growth process.

3. Data and Methodology

3.1 Data Introduction

The historic oil export shocks of Saudi Arabia are given in Figure 1, mentioning that there are 3 significant declining trends of oil exports: approximately 1986 due to the oil price war between OPEC countries, 2008 due to global financial crises and the 2014 oil price war in oil-producing countries. As seen in the figure, there are 3 significant declining trends of oil exports: approximately 1986 due to the oil price war between OPEC countries, 2008 due to global financial crises and the third is the 2014 oil price war in oil-producing countries. Even with the frequent oil price shocks in history, the Saudi Arabian economy remains very dependent on oil revenues, and 80 percent of export revenues come from the sale of oil, as shown in Figure 2.

Figure 1. Oil exports of Saudi Arabia (billion USD)

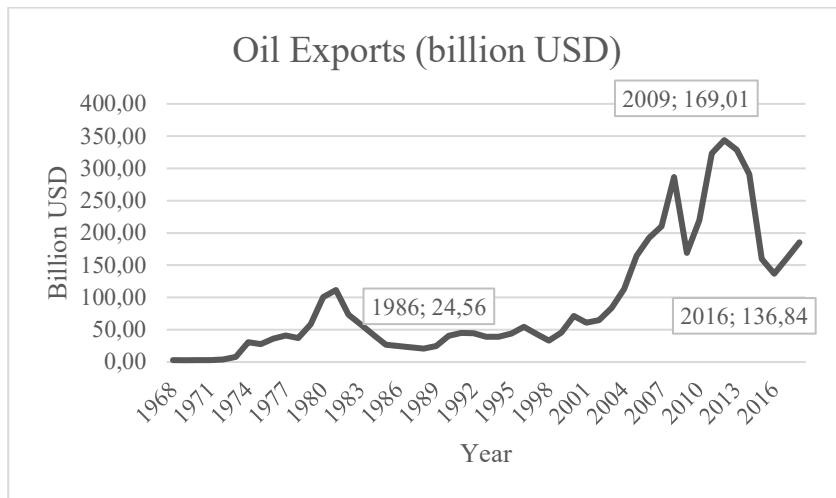
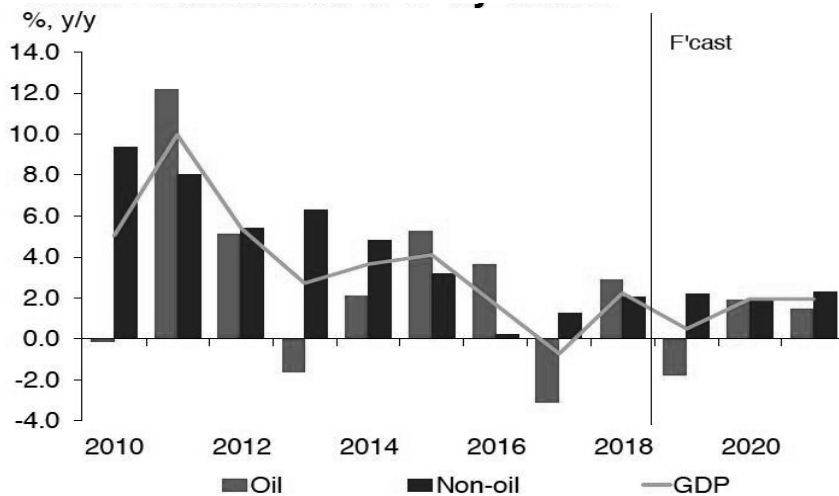


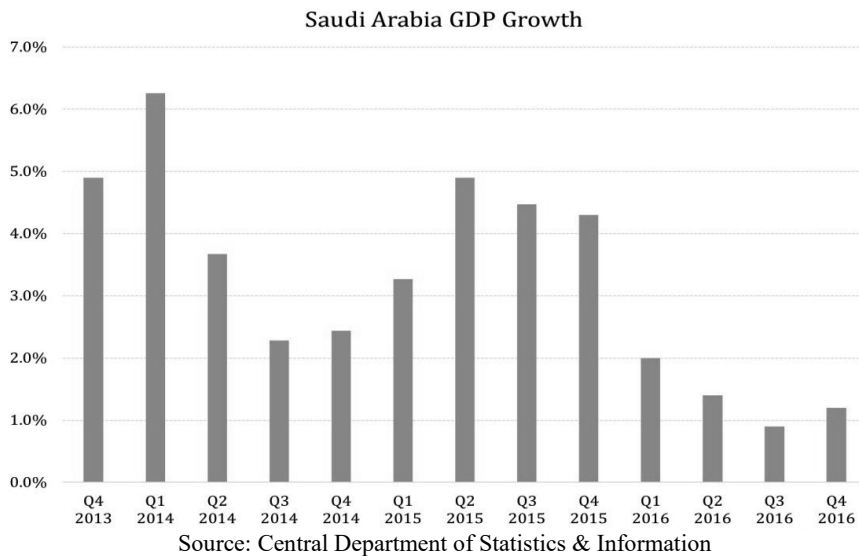
Figure 2. Saudi Arabia's real GDP different rates by sector between 2010 and 2020. In addition, the chart illustrates the Kingdom's heavy reliance, especially on the oil sector compared to nonoil sectors.



Source: Oxford Economics

Figure 3 presents the data for the GDP growth of Saudi Arabia from 2013 to 2016. It shows that GDP growth declines significantly due to a reduction in oil prices and tourism.

Figure 3. Decreasing GDP growth in Saudi Arabia between mid-2014 and early 2016 due to the largest oil-price shocks and other challenges that faced the Kingdom.



The data used for this study focus on Saudi Arabia, which covers the time period from 1968 to 20183. For the study, the data were collected from World Development Indicators (<https://databank.worldbank.org/source/world-development-indicators>). The yearly data for the entertainment industry were obtained from the General Authority of Statistics Kingdom of Saudi Arabia (<https://www.stats.gov.sa/en/491-0>). We used the natural logarithm of each variable to transform the variables, as follows by (Sarwar, Alsaggaf, and Tingqiu 2019; Shahbaz, Tang, and Shahbaz Shabbir 2011; Waheed, Sarwar, and Mighri 2020)

³ Missing data was generated through ipolate/epolate as mentioned by Sarwar et al., (2018).

The Solow growth model (1956) was used to examine the impact of labour and capital for the case of Saudi Arabia. Afterwards, the models were extended by including oil exports, which indicates the role of oil exports in economic prosperity in Saudi Arabia. Model-3 is the extension of model-2, which further examines the importance of non-oil exports in the Saudi economy. Model-4, Model-5 and Model-6 investigate the role of technology, industrialisation and tourism in the economic growth process. The studied models are given below:

Models:

$$GDP = \beta_0 + \beta_1 L + \beta_2 K + \varepsilon \quad \text{eq-1}$$

$$GDP = \beta_0 + \beta_1 L + \beta_2 K + \beta_3 Oil + \varepsilon \quad \text{eq-2}$$

$$GDP = \beta_0 + \beta_1 L + \beta_2 K + \beta_3 Oil + \beta_4 non - Oil + \varepsilon \quad \text{eq-3}$$

$$GDP = \beta_0 + \beta_1 L + \beta_2 K + \beta_3 Oil + \beta_4 non - Oil + \beta_5 Technology + \varepsilon \quad \text{eq-4}$$

$$GDP = \beta_0 + \beta_1 L + \beta_2 K + \beta_3 Oil + \beta_4 non - Oil + \beta_5 Technology + \beta_6 Industry + \varepsilon \quad \text{eq-5}$$

$$GDP = \beta_0 + \beta_1 L + \beta_2 K + \beta_3 Oil + \beta_4 non - Oil + \beta_5 Technology + \beta_6 Industry + \beta_7 Tourism + \varepsilon \quad \text{eq-6}$$

$$GDP = \beta_0 + \beta_1 L + \beta_2 K + \beta_3 Oil + \beta_4 non - Oil + \beta_5 Technology + \beta_6 Industry + \beta_7 Tourism + \beta_8 Entertainment + \varepsilon \quad \text{eq-7}$$

where GDP stands for the gross domestic product for Saudi Arabia (constant 2010 US\$). L is the total labour force available in Saudi Arabia. K presents the capital, which is defined as gross fixed capital formation (current US\$). Oil and non-Oil are the oil exports and non-oil exports for Saudi Arabia, respectively, measured in current US\$. Technology was used as a proxy of innovation, which was high-technology exports (current US\$). Industry represents industrialization in Saudi Arabia, which is measured by industry value added in US\$. Tourism was international tourism receipts in current US\$. Most importantly, entertainment was one of the key variables for this study, which was obtained from the General Authority of Statistics Kingdom of Saudi Arabia.

4. Results and Discussion

4.1 Descriptive

Table 1 represents the descriptive statistics for the studied variables. There is no sign of outliers in the transformed dataset, as mentioned from the minimum, maximum, and standard deviation. However, we can conclude that the data are appropriate for regression estimations. Moreover, Table 2 shows the correlation results of the studied variables.

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP	51	26.538	0.486	25.064	27.260
Labour	51	15.575	0.455	14.907	16.473
Capital	51	25.599	1.208	21.747	27.318
Oil export	51	24.657	1.280	21.716	26.563
Non-Oil export	51	21.519	2.672	15.748	25.087
Technology	51	15.113	4.187	6.815	23.637
Industry	51	26.155	0.426	24.830	26.722
Tourism	51	14.305	7.937	-0.468	23.521
Entertainment	51	21.205	0.307	20.899	22.311

Table 2. Correlation matrix

	GDP	Labour	Capital	Oil export	Non-Oil export	Technology	Industry	Tourism	Entertainment
GDP	1								
Labour	0.87	1.00							
Capital	0.96	0.80	1.00						
Oil export	0.93	0.82	0.94	1.00					
Non-Oil export	0.89	0.91	0.83	0.89	1.00				
Technology	0.87	0.94	0.78	0.82	0.97	1.00			
Industry	0.97	0.77	0.92	0.87	0.78	0.76	1.00		
Tourism	0.85	0.93	0.75	0.82	0.96	0.97	0.75	1.00	
Entertainment	0.70	0.83	0.62	0.57	0.69	0.78	0.62	0.69	1.00

4.2 Regression estimation

The findings of the regression estimations are given in Table 3, which presents the coefficient results from model-1 to model-6. Model-1 indicates the significance of the Solow growth model in the case of Saudi Arabia, as the coefficients of labour and capital are significant and positive. In Model 2, oil exports have an insignificant coefficient, which indicates that an increase in oil exports is not a prominent measure of sustainable economic growth in Saudi Arabia. This finding is in line with (Waheed, Sarwar, and Dignah 2020). For model-3, we include non-oil exports to investigate the role of non-oil exports in the economic growth process of Saudi Arabia and to compare it with oil exports. Interestingly, the coefficients for oil exports and non-oil exports are insignificant, mentioning that exports are not a significant contributor to economic growth.

In model-4, we further extend the model by adding technology, which is a proxy for innovation in Saudi Arabia. The coefficient for technology is 0.055, significant at the 1% level of significance, indicating that higher innovation leads to an increase in economic growth in Saudi Arabia. The findings are in

line with (Kesici Çalkan 2015; Long 2019; Nardone and Ridolfi 2019; Pece, Simona, and Salisteanu 2015; Shahzad, Qin, and Farooq 2019)

While reporting the results of model-5, we found significant and positive coefficients for labour, capital, non-oil exports and industrialisation. However, the coefficient of oil exports became significant and negative, implying that Saudi Arabia is not able to achieve long-term economic growth by exporting oil products. Model-6 added tourism in model-5, and the findings for model-6 are similar to those for model-6. The coefficient of tourism is insignificant, suggesting that tourism has no contribution to the Saudi economy in the studied period. The main contribution of the current study was to examine the role of the entertainment sector in Saudi GDP; however, model-7 augments model-6 by adding entertainment variables.

After the empirical estimations, quantile regression and the autoregressive distributed lagged (ARDL) approach were used for robust estimations, as reported in Table 4. We found similar results for all the studied variables. Labour, capital, non-oil exports, industrialisation and entertainment have significant and positive relationships with economic growth. On the other hand, in the long run, dependency on oil exports is significant and negative, which is an alarming situation for the Saudi economy, which still relies on oil exports.

Table 3. Regression results

Variable	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6	Model-7
Labour	0.315*** (0.000)	0.314*** (0.000)	0.228*** (0.003)	0.046 (0.554)	0.130*** (0.000)	0.126*** (0.000)	0.145*** (0.000)
Capital	0.292*** (0.000)	0.289*** (0.000)	0.299*** (0.000)	0.300*** (0.000)	0.111*** (0.000)	0.113*** (0.000)	0.112*** (0.000)
Oil export		0.003 (0.932)	-0.030 (0.526)	0.012 (0.798)	-0.027** (0.020)	-0.0271** (0.033)	-0.0288** (0.044)
Non-Oil export			0.026 (0.132)	-0.048 (0.143)	0.029*** (0.000)	0.027*** (0.001)	0.027*** (0.003)
Technology				0.055*** (0.003)	0.004 (0.428)	0.004 (0.449)	0.007 (0.270)
Industry					0.613*** (0.000)	0.609*** (0.000)	0.614*** (0.000)
Tourism						0.001 (0.704)	0.007 (0.772)
Entertainment							0.006** (0.02)
Constant	14.160*** (0.000)	14.176*** (0.000)	15.495*** (0.000)	18.040*** (0.000)	5.621*** (0.000)	5.756*** (0.000)	5.930*** (0.000)

Notes: ***, **, * represents the level of significance at 1%, 5% and 10%, respectively. The values in brackets are p values of each coefficient.

Table 4. Robust estimations

Variable	Quantile Regression		ARDL	
	Coef	p value	Coef	p value
Lag-GDP	-	-	0.094	0.007
Labour	0.120	0.000	0.177	0.000
Capital	0.129	0.000	0.090	0.000
Oil export	-0.031	0.007	-0.027	0.006
Non-Oil export	0.028	0.013	0.020	0.016
Technology	0.003	0.653	0.008	0.205
Industry	0.591	0.000	0.580	0.000
Tourism	0.001	0.772	0.002	0.392
Entertainment	0.009	0.048	0.046	0.094
Constant	6.220	0.000	4.947	0.000

Notes: ***,**,* represents the level of significance at 1%, 5% and 10%, respectively. The values in brackets are p values of each coefficient.

4.3 Discussion

While discussing the applicability of the Solow growth model, in the case of Saudi Arabia, it can be concluded that labour and capital are some of the most prominent factors of economic growth. However, the Saudi government must take pre-emptive measures to increase capital investment and the labour force. The findings are in line with (Sarwar, Chen, and Waheed 2017; Shahbaz et al. 2017; Sarwar et al. 2018; Sarwar, Alsaggaf, and Tingqiu 2019; Waheed, Sarwar, and Dignah 2020).

Oil export is one of the key sources of income generation for the Saudi government, contributing approximately 80% of total exports (McIntosh 2020). This proves the dependence of the Saudi government on oil, which is not guaranteed for long-term economic growth, as shocks in oil prices, oil demand and oil supplies have devastating impacts on the Saudi economy (Waheed, Sarwar, and Dignah 2020). However, our findings for oil exports validate export diversification theory to attain sustainable economic growth.

The coefficients of non-oil exports for model-5 and model-6 are significant and positive, which confirms that Saudi Arabia must diversify its exports to have long-term economic prosperity.

Technology has reported mixed evidence; however, the role of innovation in triggering the economic process cannot be neglected. It provides the opportunity to increase the exports of technological equipment, which increases cash inflows (Chansarn 2010; Pan et al. 2019; Subrahmanya and Kumar 2011).

Industrialisation has a positive relationship with economic growth, as indicated by the significant and positive coefficient of industry. The results suggest that the Saudi government must introduce industrial reforms, attractive packages for foreign direct inflows, plan new industrial zones with facilities, etc. The era of industrialization is useful for resolving a number of economic issues, such as unemployment and oil dependency.

Surprisingly, the coefficient of tourism is insignificant, which negates the findings of (Waheed, Sarwar, and Dignah 2020). The insignificance can be due to the inclusion of long-term data that cover the period of non-tourism activities in Saudi Arabia. The Saudi government has recently focused its attention on the tourism sector. However, in the future, the tourism sector will participate in economic growth.

The empirical estimation of model-7 reports the significance of the entertainment sector, which is significant at the 5 percent level, mentioning that the Saudi economy can achieve sustainable growth by diverting its attention towards the entertainment sector. The growth of the entertainment sector contributes to economic prosperity by using a number of channels, such as creating employment opportunities and creating more room to increase the spending of domestic persons. Instead of the significant and positive coefficient of entertainment, the magnitude of the coefficient is very low (0.006), which indicates that serious and prompt actions are required by the Saudi government to attain sustainable economic growth.

5. Conclusion

The objective of the current study was to find the key issues that are dragging the Saudi economy and what measures are essential for the Saudi government to attain sustainable development. For this purpose, we have used ordinary least square estimation, quantile regression, and the autoregressive distributed lagged approach over the data of 1968-2018. The empirical estimations have confirmed the significant and positive coefficients of labour, capital, non-oil export, industrialisation and entertainment. However, oil

exports have a significant and negative coefficient, indicating that higher oil exports lead to a decrease in the economic growth process.

The findings are fruitful for policy-makers who draw economic policies. We recommend a number of policy implications. First, Saudi Arabia needs to urgently shift its policies from oil to non-oil exports. This will help the diversification of the economy and make it less affected by oil price shocks. In the long run, the dependency on oil exports is not a wise decision; however, the government has to support non-oil industries to increase their share in economic prosperity, which requires sustainable development. Fossil fuels are the main source of environmental degradation; hence, diverting to non-oil exports will support economic growth and enable the country to meet sustainability goals set in Vision 2030. Second, the government has to promote domestic and international tourism, as the tourism industry plays a role in economic prosperity. For this, it is suggested that the local authorities advertise tourism places, hire trained staff, and provide adequate knowledge to the local community, which can help tourists in the case of non-availability of tour guides. In particular, local governments are urged to improve the infrastructure of tourist locations. These changes will attract more tourists to visit the country's recreational sites. Although religious tourism is the main economic sector, through these measures, entertainment tourism will also develop, and this sector will generate more revenue. Finally, it is proposed that the Saudi government must provide entertainment opportunities at a reasonable charge instead of higher prices, which encourages local and foreign tourists to promote the entertainment industry. A reasonable price will increase the number of visitors, which will increase sales and profit as well. In such cases, the entertainment industry can play a substantial role in achieving sustainable economic growth. When more people enjoy entertainment activities, it increases tourism. Additionally, more accommodation facilities will be needed, which will affect the growth of the hotel sector. In addition, more demand for food and transportation will be created, which will affect the growth of the food and transportation sector. Similarly, demand for local labour will be enhanced. All these changes ultimately affect economic growth.

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APPENDIX

Table A1. Literature highlight

No	Author(s)	Method(s)	Data	Region	Variable	Main Finding(s)
1	Waheed et al. (2020)	ARDL bound test, Johansen co integration and Gregory-Hansen co integration methods	1980-2017 Quarterly	Saudi Arabia	economic growth, non-oil exports, and tourism	Findings propose that upgrading the non-petroleum sends out will be a great procedure for maintainable development of Saudi Arabia.
2	Albassam (2015)	Ogive Index, Entropy Index, Gini Index and Herfindahl Index	1970-2013 yearly	Saudi Arabia	Economic diversification	Oil is the main factor for driving the economy for Saudi Arabia.
3	Chirila et al. (2020)	autoregressive distributed lag (ARDL) and causal analysis	2000-2019 monthly	Central and Eastern European Countries	economic growth and tourism growth	The effect of occasions impacts the heading of the relationship between international Tourism, and financial growth.
4	Haller et al. (2020)	convergence model	2012 and 2018	Europe	tourism and economic growth	It is found that convergence was not quickened but moderate, and it was not decided by tourism factors but by related ones.

Table A1. Literature highlight (continued)

5	Chatziantoniou (2012)	VAR model	2000-2010 monthly	France, Italy, Spain and Greece	Oil price shocks, Tourism income and Economic growth	Oil particular request stuns contemporaneously influence expansion and the tourism segment value record, while these stuns do not appear to have any slacked impacts.
6	Chou (2013)	panel causality method	1988-2011 yearly	transition countries (Bulgaria, Romania And Slovenia etc.)	Tourism spending and Economic growth	The results show that non-partianship theory is within the nature of a causal heading between tourism investing and financial development.
7	Du et al. (2014)	tourism-growth model	1950 and 2014 yearly	109 countries	Tourism and Economic Growth	Findings indicate that, speculations in tourism in and of itself show up to be inadequate for financial development.
8	Jawadi and Friti (2018)	TAR model	1970 to 2016 Quarterly	Saudi Arabia	Oil Price and Economic Growth	Findings confirm the commitment of the oil division to financial development within the nation, but moreover appear that the oil/Saudi economy relationship shows nonlinearity and edge impacts.

Table A1. Literature highlight (continued)

9	Lee and Chang (2007)	multivariate model	1990–2002	OECD and non OECD countries	Tourism development and economic growth	It is found that within the long run, the board causality test appears unidirectional causality connections from tourism improvement to financial development in OECD nations, bidirectional connections in non OECD nations, but as it were frail connections in Asia.
10	Wang et al. (2020)	System Dynamic (SD) method	2010–2016 Yearly	China	Tourism Carrying Capacity and Tourism economic growth	The results demonstrate that the environmental situation re-enactment contributes to both TCC and Tourism financial growth.
11	Perles-Ribes et al. (2017)	vector auto regression (VAR) model	1955–2014 Yearly and quarterly	Spain	Tourism-led growth	Results indicate a bidirectional relationship between the development of tourism request and the economic Growth of Spain when connected to genuine series.
12	Sillah (2014)	cointegration	1974–2011 Yearly	Saudi Arabia	technology diffusion	The study found that the universal exchange, especially the oil division exchange, of Saudi Arabia shows up to play no significant part within the worldwide innovation exchange.’

