

Article

Does the Vision 2030 and Value Added Tax Leads to Sustainable Economic Growth: The Case of Saudi Arabia?

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Abstract: The motivation behind the current research is to check the effect of the recent introduction of value added tax (VAT) and Vision 2030 on the economy of Saudi Arabia. To check this, those variables are added to the analysis which contribute to economic development including labor, capital, oil price, financial development, and trade openness to examine that how economic transformation affects the role of these variables in economic growth. According to the vector error correction (VEC) model, the impact of labor becomes negative after VAT, however, the impact of capital and financial development becomes significant by this transformation. The coefficients of oil prices, for positive and negative shocks, are significant and negative. Financial development and trade openness are reporting surprising results; positive shocks have shown negative coefficients. However, after Vision 2030, trade openness has a significant and positive coefficient. Policy implications include diversification of exports, reviving the private financing mechanism and restructuring the export/import policies.

Keywords: Saudi Arabia; Vision 2030; value-added tax; sustainable economic growth; vector error correction



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1. Introduction

Sustainable economic growth and development are what almost all economies are currently trying to achieve. However, it is not that easy because many challenges are faced. Some of these challenges include increasing food and energy prices. Moreover, after the financial crisis of 2009, the overall growth rate of economies has decreased and the unemployment rate has increased. Alongside this, fluctuations in energy prices also hit economies hard, hitting both supply and demand. As a result, all sectors are hurt along with sustainable development. Also, the economy of the country is affected due to a decrease in oil prices because Saudi Arabia is the largest extractor and exporter of oil and a significant portion of GDP comprises oil and petroleum exports. In this situation, measures regarding the increase in income generation and employment creation are essential to attain sustainable economic growth.

Earlier studies attempted to discover the concerns related to sustainable economic growth and proposed number of economic models to handle the economic issues. In this regard, [1] recommended that to promote economic development in the country, tourism should be given additional importance because in the current era when traveling to other destinations becomes easy, a significant portion of GDP can be generated through this sector. Another factor identified by is foreign direct investment (FDI) that can enhance the economic growth of the country [2]. According to them, FDI brings technological know-how from other countries which is essential to achieve growth. FDI helps in the creation of employment, and due to a reduction in unemployment, the economy flourishes. Another factor identified by Li and Wei (2021) is the interest rate which can help to maintain sustainable economic growth because a high-interest rate enhances the investment as

people try to save more to obtain a high return [3]. This increase in saving allows banks to lend more money and businesses increase investment which in turn increases employment and ultimately economic growth. Exchange rate volatility is also considered a factor behind lower economic growth. Hence it is suggested that to maintain sustainable economic growth, maintenance of exchange rate at an optimal level is essential [4]. Exchange rate undervaluation can affect the economy both positively through knowledge spillover as well as technological progress and can affect the economy negatively through income inequality. Hence, the optimal level of the exchange rate is essential to promote economic growth [5].

Besides all these factors, value-added tax (VAT) is also mentioned by some authors as a factor to promote economic growth. In this regard, Ayoub and Mukherjee (2019) investigated this nexus in China and found a positive association [6]. Bansal and Alfardan (2020) suggest that government revenue can be increased by the implementation of VAT which allows the government to spend more on development to increase economic growth [7]. Guo and Shi (2021) argue that VAT helps to ease the fiscal pressure and reduction in VAT helps to recover from an economic downturn [8].

However, focusing on the contribution of the given study, it seems clear that none of the recent studies have tried to explore the effect of VAT on the Saudi Arabian economy and available research lacks data as well as the methodology to explore this relationship in the Saudi context. Saudi Arabia is one of the countries which recently introduced VAT to reduce its reliance on oil exports and control the budget deficit. Hence, exploring the effect of VAT on economic growth is essential to access its direction and implications. However, the first contribution of the current research is an attempt to fill the gap by investigating the economic growth process before and after the imposition of VAT. For this purpose, we use monthly data of key variables, as well as introducing a number of econometric approaches to obtain the robust results that help to determine the importance of VAT for Saudi Arabia. The second contribution of the existing study is to investigate the effectiveness of Saudi Vision 2030, which is placed in 2016. The aim is to achieve sustainable objectives, such as to achieve sustainable economic growth, through certain reforms in economic sectors.

Value-Added Tax (VAT) Background in Saudi Arabia

Like some other gulf states, Saudi Arabia introduced value-added tax on 1 January 2018 to support the economy by providing additional revenue. Initially, 5% VAT was implemented on all goods and services; however, after the recent global pandemic of COVID-19, the country triples this rate, and 15% VAT is imposed from July 2020. The main reason to increase this rate is to increase revenue because economic activities were reduced and health expenditures increased. According to Al-Ubaydli (2020), VAT is one of the best measures to support the economy without dismissing employees or freezing salaries [9]. Moreover, as a wide range of goods as well as services is exempted from VAT, it will be the less painful measure in an economic downturn. Although it is expected that implementation of VAT is helpful for the government to recover from an economic downturn as additional revenue will be available, however, some issues can also be faced as a result of VAT. In terms of benefits, it is predicted that a stream of stable revenue can be generated through VAT through the cheap collection method. Also, cuts to domestic spending can be reduced as VAT provides additional money for investment. However, VAT also results in consumer price inflation. Hence, soon after the transformation, such as imposing heavy expat fees and VAT, etc., Saudi Arabia had to face a significant decline in economic growth, as mentioned in Figure 1. Therefore, in order to know the exact economic effects of VAT in Saudi Arabia, an empirical examination is necessary so that related policy implications can be recommended.

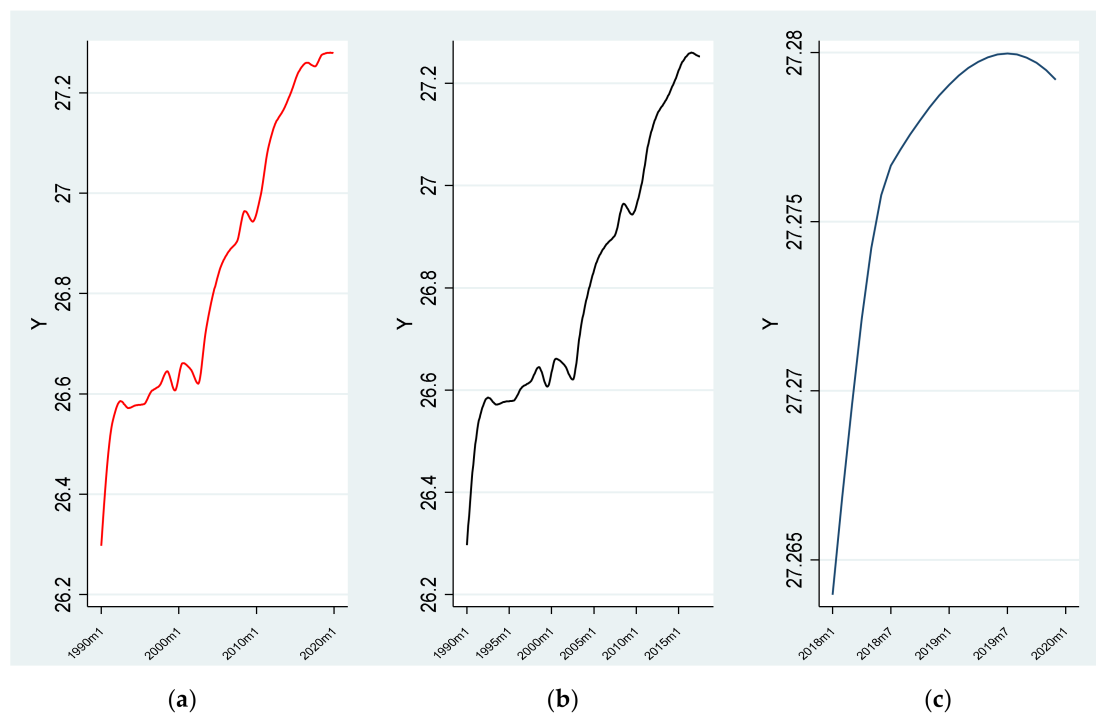


Figure 1. Economic effect of value-added tax (VAT). (a) Economic Growth Full Sample, (b) Economic Growth Before VAT, (c) Economic Growth After VAT.

2. Literature Review

2.1. Impact of Value Added Tax on Economic Growth

Jalata (2014) explored whether VAT improves economic growth and found that from the year 2003 to 2012, the economic growth of the country was boosted significantly due to VAT [10]. Hajdúchová et al. (2015) asserted that revenue from the value added tax in the Slovak republic increases from the year 1993 to 2015; however, according to them, revenue from other types of taxes was greater than the VAT revenue [11]. Likewise, according to Stoilova (2017), some type of tax play a supportive role towards economic growth. He used data from 28 states of the EU from the year 1996 to 2013 and concluded that tax revenue increases GDP growth; however, production, as well as import taxes, are beneficial to economic growth whereas value-added tax is harmful [12]. Recently Bansal and Alfardan (2020) conducted a study in Bahrain and found that the short-term impact of VAT is negative because it increases inflation and decreases foreign investment [7]. However, in the long-term, the impact of VAT on economic growth is positive as it reduces public debt as well as increasing GDP by 2%. Besides these direct effects, VAT impacts the economy indirectly also as Lan et al. (2020) found that replacement of business tax to value-added tax in China promotes an organization's R&D investment, and industries are upgraded which ultimately promotes economic growth [13]. However, Guo and Shi (2021) also proved that VAT reduction helped China to recover from the downturn of the economy due to the recent COVID-19 pandemic [8].

2.2. Impact of Oil Prices on Economic Growth

Energy prices also play a significant role in the economic growth of a country, as Arshad et al. (2016) examined this nexus in the Pakistani context and concluded that the price of oil affects economic growth positively by affecting real interest rates as well as the consumption of government [14]. Its impact on unemployment, stock prices, and exchange rates affect the economic growth negatively. However, Shahbaz et al. (2017) utilized data from 157 countries to check if oil prices have any effect on economic growth and found

that there is a positive association between these two variables [15]. Similarly, in Liberia the relationship proved to be positive between oil price and economic growth [16].

Recently, Kirca et al. (2020) conducted a study in Turkey to explore whether a fall in oil price affects the economic growth of the country and found that due to dependence on exported energy products, any change in the price of oil affects the economy significantly [17]. They suggest that the recent fall in oil price due to COVID-19 affected the Turkish economy positively. Likewise, it was also found that those economies which are low income as well exporters of oil are affected negatively by a rise in oil price in the long run whereas if the oil price decreases, the economy grows [18]. However, an increase in oil price is favorable for oil-exporting countries like Saudi Arabia, as Mahmood and Murshed (2021) found that an increase in oil price boosts the economic growth of a country whereas any decrease in oil price affects the economy negatively [19].

2.3. Impact of Financial Development on Economic Growth

Financial development affects economies by affecting different sectors differently; in Saudi Arabia, oil sector growth is positively affected by financial development whereas the non-oil sector is affected negatively which suggests that resource dominance of economies plays a role between this nexus of financial development and economic growth [20]. Likewise, it is also noted by Shahbaz, Hoang, et al. (2017) that only negative shocks in financial development hinder the growth of the Indian economy but positive shocks do not affect the economy at all. Another study used an advanced technique (PVAR) to examine the nexus between financial development and economic growth of the MENA region and found that there is a significant but negative relationship between financial development and economic growth [20].

Also, a recent study using data from Asian economies from the year 1960 to 2016 to check the co-integration as well as causality between financial development and economic growth concluded that there is no long-run co-integration between these two factors, however, in China, there is a positive causal relationship between financial development and GDP [21]. Alongside, Li and Wei (2021) assert that there exists a non-linear relationship between financial development and economic growth of China because carbon emission plays a promoting role in this relationship [3]. However, according to Cheng et al. (2021), financial development is more unfavorable to a high-income economy whereas this negative impact is low in economies where the income level is low [22].

2.4. Impact of Trade Openness on Economic Growth

Trade openness is a factor that can also help economies to grow and in this regard, Fetahi-Vehapi et al. (2015) tried to explore whether trade openness is beneficial to SEE countries as well [23]. They used the GMM technique and found that the growth effect of trade openness is significant; however, this effect is more prominent in rich countries. Also, it was found that the relationship between trade openness and economic growth is significant in both the long run as well as short-run in ASEAN countries [24]. However, Huchet-Bourdon et al. (2018) assert that the positive effect of trade openness on economic growth depends on the quality of products exported [25]. When exports consist of high-quality products, this positive effect is more significant whereas when low-quality products are exported, the effect becomes less significant.

Although trade openness is beneficial for the economy directly, it can also play an indirect role in promoting the economic growth of oil-abundant countries because, through trade openness, competitive prices can be obtained for oil, and access to advanced technologies can be obtained for extraction of oil which can help in the growth of these economies [26]. Also, the positive effect of trade openness on the Chinese economy was proved in the short as well as long run, and it was concluded by Kong et al. (2021) that opening up promotes factor productivity as well as capital formation and technological progress which ultimately promote economic growth [27]. Similarly, Arvin et al. (2021) also

found the same type of long and short-run positive association between trade openness and economic growth in G-20 countries by analyzing data from the year 1961 to 2019 [28].

2.5. Econometric Estimations Used by Previous Studies

Khobai et al., 2018 used the ARDL method to examine the impact of tax on economic growth for South Africa, which confirmed a negative impact of tax on the economy. (Badri et al., 2013) used ARDL methodology, which found a negative impact of tax on economy [29]. (Ojede and Yamarik, 2012) explored the data of 48 states of the US, and pooled mean group estimations have reported the negative association between sales and property tax on economic growth, while income tax had an insignificant relationship [30]. (Sowole and Adekoyejo, 2019) took linear regression estimations, which showed the negative impact of value added tax on economic activities in Nigeria [31]. (Stoilova, 2017b) employed ordinary least square method to investigate the relationship between tax structure and tax burden on European economies [32]. The findings concluded the positive impact of tax structure on economic growth. (Onakoya et al., 2017) used ordinary least square, fixed effect and random effect model, the findings confirm the positive and significant coefficients for all the estimations [33]. (Ojong et al., 2016) preferred the random effect estimation, using the Nigerian economy, and confirmed the positive and significant relationship between tax and the economy [34]. By using structural vector autoregressive regression, (Ocran, 2011) confirmed the positive relationship between tax and economic growth in South Africa [35]. (Onaolapo et al., 2016) performed stepwise regression estimations which presented the mix evidences of value added tax on economic activities [36].

Although previous researches tried to explore the nexus between VAT and economic growth, it is evident that there is no strong argument regarding the role of VAT in promoting economic growth. In this regard, it is argued that VAT is beneficial for economic growth only in the long run, but in the short run VAT adversely affects economic growth. On the contrary, it was also found by some authors that VAT is harmful to economic growth whereas it was also noted that VAT helps some economies to recover from a downturn. However, all these studies used data from countries other than Saudi Arabia and this nexus is still unexplored using Saudi Arabian data. In Saudi Arabia, the recent increase in VAT shows the impact on different economic indicators; however, there is a lack of research that can show these effects through original data. Similarly, the existing literature fails to examine the impact of Saudi Vision 2030, which is more than important to investigate. In light of these gaps, the current study is an attempt to explore these effects by exploring real and updated data to check what is the current impact of VAT and Vision 2030 on the Saudi economy and what future measures are necessary. Lastly, the previous studies have used traditional estimations, while some used only symmetric econometric techniques to examine the variables. This study uses the asymmetric analysis to investigate the response of economic growth on positive and negative shocks in independent variables. The use of asymmetric estimations provides detailed analysis compared to the traditional econometric estimations.

3. Data and Methodology

We use the yearly data of Saudi Arabia from the year 1990 to 2020; however, we reform the data into monthly basis for analysis (The main reason for using monthly data is to form enough observations for after-vat period, as the period is very short which comprises 2018–2020. Moreover, we use ipolate/epolate to form the balance data panel data). The main variables of current study are economic growth, value added tax, labor, capital, oil price, financial development, and trade openness. Data for economic growth, labor, capital, financial development, and trade openness are taken from the World Development Indicators (WDI), while the data of oil price is collected from the OPEC website. To examine the impact of VAT on economic growth, we use two dummy variables: (i) VAT (0 for not VAT period and 1 for VAT period). (ii) Vision 2030 (0 for Before-Vision 2030 period and 1

for After-Vision 2030 period). Due to less availability of VAT and Vision 2030 samples, we transpose the dataset to monthly data. A description of variables is given in Table 1.

Table 1. Variables and definitions.

Variable	Description	Variable
Economic Growth	GDP (constant 2010 US\$)	Y
Labor	Labor force, total	L
Capital	Gross fixed capital formation (current US\$)	K
Oil Price	OPEC oil prices in USD	OP
Financial Development	Domestic credit to private sector (% of GDP)	FD
Trade Openness	Ratio of sum of export and import to GDP	TO

Notes: Y represents the economics growth, L and K are the labor and capital, respectively. OP shows the oil price, FD and TO are financial development an trade openness.

In order to measure the financial development, two proxy variables are used. These are: the ratio of private sector credit to GDP, that is, DC. trade openness (ratio of sum of export and import to GDP) is used to represent the trade openness in the economy. The studied models are given below:

$$Y = f(\text{Labor}, \text{Capital})$$

$$Y = f(\text{Labor}, \text{Capital}, \text{Value Added Tax})$$

$$Y = f(\text{Labor}, \text{Capital}, \text{Value Added Tax}, \text{Oil Prices})$$

$$Y = f(\text{Labor}, \text{Capital}, \text{Value Added Tax}, \text{Financial Development})$$

$$Y = f(\text{Labor}, \text{Capital}, \text{Value Added Tax}, \text{Trade Openness})$$

$$Y = f(\text{Labor}, \text{Capital}, \text{Value Added Tax}, \text{Oil Prices}, \text{Financial Development}, \text{Trade Openness})$$

The selection of variables is based on their expected effect on economic growth. In the case of oil price, it is selected as an independent variable because, being an oil exporter, any fluctuation in the price of oil in the international market directly affects the economy of Saudi Arabia. The selection of financial development is due to the fact that usually a financial system in natural resource-based economies tends to be weak, as Samargandi et al. (2014) asserts that banking system provides less private sector credit despite having high profitability and liquidity, which leads to a natural resource curse regarding the financial development of these economies [37]. Hence, the effect of financial development on economic growth must be checked in order to know how exactly it affects overall economic growth. In the case of trade openness, previously it is noted by Majumder et al. (2020) and Ziaur Rehman et al. (2015) that in oil or other natural resources-rich countries, trade openness not only provides advanced extraction technologies but also by using these technologies, new and upgraded products can be manufactured [26,38]. The high prices of natural resources can be achieved in the international market through openness to trade. For standardization, we use the log-transformation for each equation, and the studied equations are mentioned below:

$$Y = \beta_0 + \beta_1 \text{Labor} + \beta_2 \text{Capital} + \epsilon$$

$$Y = \beta_0 + \beta_1 \text{Labor} + \beta_2 \text{Capital} + \beta_3 \text{Oil Prices} + \epsilon$$

$$Y = \beta_0 + \beta_1 \text{Labor} + \beta_2 \text{Capital} + \beta_3 \text{Financial Development} + \epsilon$$

$$Y = \beta_0 + \beta_1 \text{ Labor} + \beta_2 \text{ Capital} + \beta_3 \text{ Trade Openness} + \epsilon$$

$$Y = \beta_0 + \beta_1 \text{ Labor} + \beta_2 \text{ Capital} + \beta_3 \text{ Oil Prices} + \beta_4 \text{ Financial Development} + \beta_5 \text{ Trade Openness} + \epsilon$$

4. Results and Discussion

4.1. Descriptive Statistics

Table 2 presents the descriptive statistics of the study variables including GDP, labor, capital, oil price, financial development, trade openness, and value-added tax. It can be observed that the highest mean value is related to GDP with a mean of 26.87 whereas the standard deviation for GDP is 0.28. The minimum value of GDP is 26.29 whereas the maximum value is 27.28. The lowest mean value 0.099 is related to VAT and the standard deviation is 0.29. The minimum value of VAT is 0 whereas the maximum value is 1.

Table 2. Descriptive statistics.

Variable	No. of Obs.	Mean	Std. Dev.	Min	Max
Y	372	26.867	0.278	26.297	27.279
L	372	15.923	0.359	15.420	16.486
K	372	24.923	0.808	23.668	26.007
OP	372	3.637	0.671	2.507	4.695
FD	372	0.127	0.012	0.101	0.149
TO	372	0.545	0.265	0.220	1.003
VAT	372	0.099	0.296	0	1

4.2. Unit Root Test

To check if the unit root is present in the series or not, or more specifically to check the stationarity of a variable, a unit root test was conducted and results are presented in Table 3. Although there are many types of test, in the current study the ADF-GLS unit root test was used. It can be seen that all variables are non-stationary when level, whereas, they are stationary at first difference. There is strong evidence that all variables including GDP, capital, labor, oil price, financial development, and trade openness are integrated with the first-order and the level of significance of I(1) is 1% for all variables. Hence, it can be said that to make all series stationary, the first difference is sufficient and this also fulfills the first condition to use the vector error correction model. Also, the prerequisite of the co-integration relationship is established by examining the stationarity of series at the first difference.

Table 3. Unit root test.

	Level	Difference
Y	0.168	−7.053 ***
L	−0.233	−5.028 ***
K	0.004	−5.089 ***
OP	0.889	−4.505 ***
FD	0.467	−8.99 ***
TO	2.069	−3.855 ***

Notes: Y is the economic growth, L is the labor, K shows the capital, OP is oil price, FD is financial development and TO stands for trade openness. *** represents the level of significance at 1%.

4.3. Johansen and Engle–Granger Cointegration Test

After finding the first condition for the existence of a long-run relationship between the study variables, the next step is to apply a co-integration test to validate if there exists a long-run relationship or not. Hence, in the current study, two types of co-integration test are used including Johansen, and Engle and Granger. The main reason for using two tests is that, although Engle and Granger use two steps to check the co-integration, co-integration relationships of more than two cannot be handled by this test. Two different tests of likelihood ratios are used in the Johansen test which helps to determine linearly independent co-integration vectors. Table 4 presents the results of these two tests and it can be seen that in both tests the null hypothesis of no co-integration is rejected in all models, and there is co-integration between variables of the study. This suggests that there exists a long-run relationship between GDP, labor, capital, oil price, financial development, trade openness, and VAT.

Table 4. Johansen and Engle–Granger co-integration test.

	Johansen	CI	Engle-Granger	CI
Model-1	150.42	Exist	−8.67	Exist
Model-2	272.01	Exist	−5.51	Exist
Model-3	235.21	Exist	−9.09	Exist
Model-4	240.35	Exist	−6.39	Exist
Model-5	468.94	Exist	−6.88	Exist

4.4. Vector Error Correction Model

The presence of co-integration tells us that there is a long-run relationship between study variables hence, the application of the vector error correction model is appropriate. However, the main objective of this study is to investigate the effect of value-added tax on the economic growth of Saudi Arabia. Hence, data is divided into three parts as a full sample, before VAT, and after VAT so that a complete picture can be derived regarding the economic impact of VAT in the country. Tables 5–7 presents the results of these estimations.

Table 5. Vector error correction for full sample.

	Model-1	Model-2	Model-3	Model-4	Model-5
ΔY	0.938 ***	0.949 ***	0.960 ***	0.940 ***	0.960 ***
ΔL	0.038 *	0.077 ***	0.002	0.063 ***	0.068 **
ΔK	−0.002	0.004	0.001	−0.004	0.011
ΔOP		0.005 ***			0.007 *
ΔFD			−0.205 **		−0.084
ΔTO				0.014 ***	−0.011
Constant	0.0000	0.0000	0.0000	0.0000	−0.0001
EC	−0.00897 ***	−0.00651 ***	−0.00434 ***	−0.00830 ***	−0.00483 ***

Notes: Y is the economic growth, L is the labor, K shows the capital, OP is oil price, FD is financial development and TO stands for trade openness. EC is the error correction term. *, **, *** represents the level of significance at 10%, 5% and 1%.

Table 6. Vector error correction before VAT.

	Model-1	Model-2	Model-3	Model-4	Model-5
ΔY	0.935 ***	0.948 ***	0.963 ***	0.944 ***	0.963 ***
ΔL	0.052 *	0.130 ***	0.038	0.124 ***	0.099 ***
ΔK	−0.001	0.008	−0.004	0.004	0.007
ΔOP		0.004 **			0.008 *
ΔFD			−0.127		0.136
ΔTO				0.009 *	−0.008
Constant	0.0000	−0.000239 **	0.0000	−0.000183 *	−0.000282 ***
EC	−0.00881 ***	−0.00656 ***	−0.00578 ***	−0.00571 ***	−0.00693 ***

Notes: Y is the economic growth, L is the labor, K shows the capital, OP is oil price, FD is financial development and TO stands for trade openness. EC is the error correction term. *, **, *** represents the level of significance at 10%, 5% and 1%.

Table 7. Vector error correction after VAT.

	Model-1	Model-2	Model-3	Model-4	Model-5
ΔY	1.078 ***	0.629 ***	0.951 ***	−0.309	0.507 **
ΔL	0.186 ***	0.094 **	−0.021	−0.112	−0.058
ΔK	0.026 **	0.04 ***	0.220 ***	−0.0618 ***	0.273 *
ΔOP		0.030 ***			−0.022
ΔFD			−0.505 *		2.662 ***
ΔTO				0.286 ***	0.117 **
Constant	−0.000236 ***	0.000575 **	0.0001	0.0001	0.0008
EC	−0.0226 ***	−0.00363 ***	0.0252 ***	0.0749 ***	0.00974 *

Notes: Y is the economic growth, L is the labor, K shows the capital, OP is oil price, FD is financial development and TO stands for trade openness. EC is the error correction term. *, **, *** represents the level of significance at 10%, 5% and 1%.

4.4.1. Full Sample Estimation

Table 5 presents the results of the full sample VAR for all five models. It can be seen that labor is significantly and positively related to economic growth in model 1 which is a slow growth model whereas the relationship between capital and economic growth is insignificant. Hence, it will be correct to say that change in Saudi Arabian economic growth can be explained by only labor according to the slow growth model in the full sample. The coefficient of labor is 0.038 at a 10% level of significance which suggests that a 1% increase in labor increases the economic growth by 0.038%. However, in Model 2, which is an extension of Model 1 by adding oil price, the impact of labor on GDP becomes strong with a coefficient of 0.077 at a 1% level of significance. Capital is again not related to economic growth in this model as well but the relationship between oil price and GDP is positive as well as significant at a 1% level with a coefficient of 0.005. Hence, a 1% increase in oil price increases the economic growth of the country by 0.005%. Hathroubi and Aloui (2021) also found similar results when they examined the relationship between oil price and the economic growth of Saudi Arabia [39].

Turning attention towards the third model, this is an extension of the slow growth model by adding financial development. It can be observed that the impact of labor and capital on economic growth disappear; however, financial development is significantly and negatively related to economic growth at a 5% level of significance. The coefficient value of −0.205 is an indicator that if financial development is increased by 1% then economic growth decreases by 0.205%. This result is aligned with the findings of Charfeddine and Kahia (2019) who also suggest that capital is not related to economic growth whereas

financial development is negatively related to economic growth [40]. In Model 4, trade openness is added to Model 1, the slow growth model, to check if there is any relationship between trade openness and the economic growth of Saudi Arabia. Here, labor is affecting economic growth positively and significantly at a 1% level whereas there is no relationship between capital and economic growth. Also, the impact of trade openness on the economy of Saudi Arabia is positive and significant at a 1% level with a coefficient value of 0.014. Hence, it can be said that if trade openness increases by 1%, the economy of the country grows by 0.014%. Kong et al. (2021) and Arvin et al. (2021) also concluded that the impact of trade openness on economic growth is significantly positive [27,28].

Model 5 is a full model where all study variables are included to check how all these variables jointly affect the economic growth of Saudi Arabia. In this model, only labor, and oil prices are significantly and positively related to economic growth whereas all other variables are insignificantly related to the country's economy. However, the impact of labor on economic growth is stronger i.e., a 5% level of significance with a coefficient of 0.068 as compared to oil prices i.e., a 10% level of significance with a coefficient of 0.007. The result regarding oil price is consistent with the findings of [19], who suggest that oil-exporting countries gain the benefits of oil price increase. Also, stability of VAR for a full sample is also proved from Figure 2 as all dynamic matrix's eigenvalues are placed within the circle. Hence, this proves that the full sample VAR model is not mis-specified.

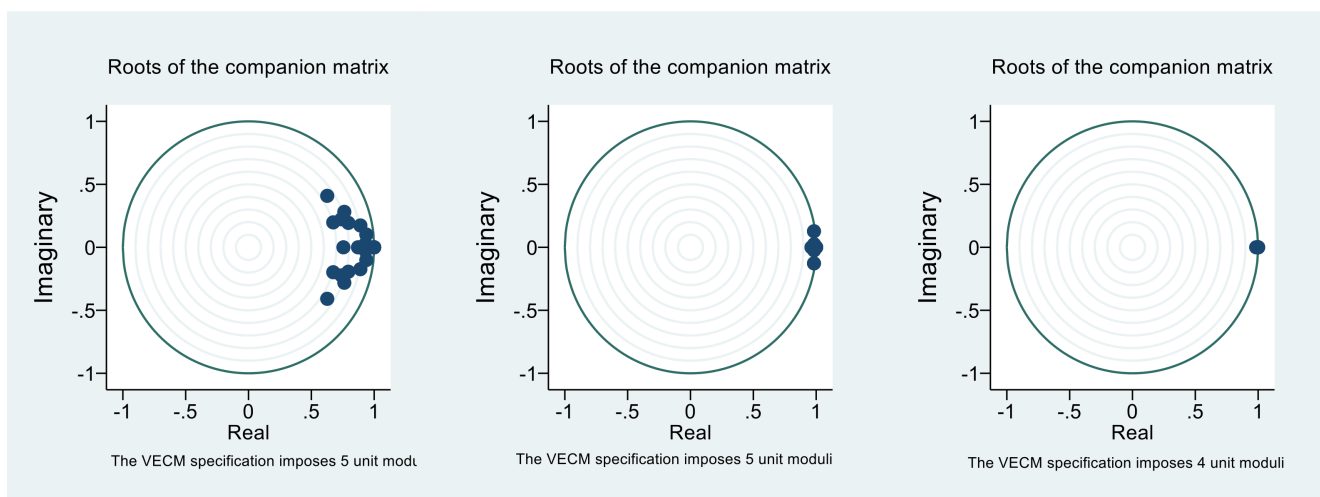


Figure 2. Stability test.

4.4.2. Before VAT Estimation

Although full sample estimation gives a picture of the impact of different factors on the economy, in Saudi Arabia major transformations were made in 2017 including VAT imposition as well as the imposition of labor fees. Efforts were made to promote the tourism sector to support the economy. Hence, the current study investigates the effects of these transformations by dividing the data into two parts i.e., before VAT and after VAT. The results of VECM applied before VAT data are reported in Table 6 and Figure 2, and it is evident that in Model 1, labor is positively related to economic growth at a 10% level of significance however, there is no relationship between capital and economic growth. Hence, labor is the only factor in the slow growth model which can explain changes in a country's economy. Likewise, in Model 2, which is an extension of Model 1 by adding oil price, again labor is significantly and positively related to economic growth; however, the level of significance is 1% in this model. This means that a 1% increase in labor increases the economic growth by 0.130%. Also, the effect of oil price on economic growth is significantly positive at a 5% level with a coefficient of 0.004. Hence, it can be said that before the VAT,

a 1% increase in oil price increases economic growth by 0.004%. The same type of result is also found by [41].

Analyzing Model 3, it can be seen that after adding financial development in the slow growth model, the effect of labor and capital on economic growth becomes insignificant. In Model 3, none of the variables is significantly related to economic growth including financial development. This result is in contrast to the findings of [3]. However, in Model 4, where trade openness is included in the model, the effect of labor on economic growth becomes positive and significant on economic growth. The coefficient of labor is 0.124 which means that before the economic transformation, a 1% increase in labor increases the economic growth by 0.124%. Likewise, trade openness is also positively and significantly related to economic growth at a 10% level. The value of the coefficient is 0.009 which is an indicator that a 1% increase in trade openness increases economic growth by 0.009%. This result is consistent with the findings of [42], which reports the positive and significant relationship between trade openness and economic growth.

In Model 5, when all variables are simultaneously added to the equation, results suggest that only labor and oil price are related to the economic growth of Saudi Arabia whereas all other variables are not showing any effect. The effect of labor on economic growth is positive and significant at a 1% level and the coefficient is 0.099. This suggests that a 1% increase in labor increases economic growth by 0.099%. Also, the oil price is positively and significantly related to economic growth at a 10% level. The value of the coefficient is 0.008 which means that a 0.008% increase in economic growth is due to a 1% increase in oil price. Aldubyan and Gasim (2021) also reported the same type of positive association between oil price and economic growth in Saudi Arabia [43]. As all eigenvalues are inside the unit circle in Figure 2, this proves that the VAR model for before VAT is not mis-specified.

4.4.3. After VAT Estimation

As explained earlier, the main objective of this research is to check if economic transformation helps in enhancing the economic growth of Saudi Arabia or not. Hence, after estimation on before VAT data, analysis was undertaken on data from after the imposition of VAT in Saudi Arabia in 2017. Figure 2 presents the graphical representation of the economic effect of VAT. The results of VECM for this data are presented in Table 7 and it is evident that in Model 1, both labor and capital are significantly and positively related to economic growth. The coefficient of labor is 0.186 which is significant at the 1% level whereas the coefficient of capital is 0.026 which is significant at the 5% level. Hence, it can be said that in the slow growth model, 1% increases in labor and capital increase economic growth by 0.186% and 0.026% respectively. This result is consistent with the results of Solarin (2020) who also found that both labor and capital enhanced economic growth [44].

If we turn our attention to Model 2 which is just an extension of the slow growth model by adding oil price in the equation, it can be seen that all variables including labor, capital, and oil price are significantly and positively related to the economic growth of Saudi Arabia. Here, the coefficient of labor is 0.094 at a 5% level of significance whereas the coefficient of capital is 0.04 at a 1% level of significance. The relationship between oil price and economic growth is significant at a 1% level and the value of its coefficient is 0.030. Hence, it is right to say that if the oil price increases by 1%, the resulting increase in economic growth would be 0.030%. This result is consistent with the finding of Aldubyan and Gasim (2021) who also concluded that after energy price reforms, economic growth in Saudi Arabia increased significantly [43].

In Model 3, financial development is added to the main slow growth model and the results indicate that the effect of labor disappeared whereas capital was still significantly related to economic growth at a 1% level. The coefficient of capital is 0.220 which means that a 1% increase in capital results in a 0.220% increase in economic growth. However, the effect of financial development on economic growth is negative and significant at a 10% level. The value of the coefficient is -0.505 which indicates that if financial development increases

by 1%, economic growth decreases by 0.505%. Hao et al. (2020) also found the same type of negative association between financial development and economic growth [45].

In Model 4, trade openness is added to Model 1 to check if openness to trade enhances the economy or not. In this model, the effect of labor on economic growth becomes insignificant whereas the effect of capital is negative and significant at a 1% level. The coefficient of capital is -0.0618 which indicates that a 1% increase in capital decreases economic growth by 0.0618%. However, the effect of trade openness on economic growth is positive and significant at a 1% level. The coefficient of trade openness is 0.286 which suggests that if trade openness increases by 1%, the economy grows by 0.286%. This result is consistent with the findings of [45]. In the last model, all variables are included in the equation to check what the joint impact of these variables on economic growth is after the introduction of VAT in Saudi Arabia. In this model, the effect of labor and oil price on economic growth is insignificant whereas capital, financial development, and trade openness are significantly related to the economic growth of the country. The relationship between capital and economic growth is positive and significant at a 10% level. The coefficient value for capital is 0.273 which indicates a 0.273% increase in economic growth is due to a 1% increase in capital. Likewise, the effect of financial development on economic growth is positive and significant at a 1% level. The coefficient value of 2.662 indicates that a 1% increase in financial development increases economic growth by 2.662%. This result is aligned with the results of Samargandi et al. (2014) who also concluded that the Saudi Arabian economy is enhanced by an increase in financial development in the country [37]. The relationship between trade openness and economic growth is also positive with a significance level of 5%. The trade openness coefficient is 0.117 which is an indication that the increase in economic growth would be 0.117% if trade openness in Saudi Arabia increases by 1%. Ziaur Rehman et al. (2015) also suggested that trade openness is beneficial for the Saudi Arabian economy as the pace of economic growth increases due to increasing trade openness [38]. Additionally, all eigenvalues of the dynamic matrix are placed on the circle in Figure 2 which suggests that the VAR model after VAT is not mis-specified and this also proves the stability of this model. The results of the stability test for all models are provided in Figure 2.

4.4.4. Before Vision 2030 Estimation

As mentioned earlier, another main objective besides checking the impact of VAT is to see if the Saudi economy has been affected by vision 2030. For data analysis, data are divided into two parts: before implementation of vision 2030 in 2016, and after implementation of vision 2030 starting from 2017. Table 8 presents the results of the vector error correction model for before vision 2030. Model 1, where only labor and capital are independent variables, both of these variables are insignificantly related to economic growth. In Model 2, when oil prices are added to Model 1, the effect of labor becomes significant and positive at a 5% level of significance with a coefficient value of 0.061. This suggests that a 1% increase in labor will increase economic growth by 0.061%. Similarly, oil prices are also significantly and positively related to economic growth at a 1% level of significance. The coefficient for oil prices is 0.0061 indicating that if oil price increases by 1%, economic growth increases by 0.0061%. In Model 3, financial development is added to Model 1, and the results of this model show that financial development as well as labor and capital are insignificantly related to economic growth.

Table 8. Vector error correction before Vision 2030.

	Model-1	Model-2	Model-3	Model-4	Model-5
ΔY	0.935 ***	0.957 ***	0.969 ***	0.955 ***	0.975 ***
ΔL	0.039	0.061 **	0.028	0.036	−0.014
ΔK	0.003	0.003	−0.005	−0.005	−0.005
ΔOP		0.0061 ***			0.010 **
ΔFD			−0.128		0.321
ΔTO				0.018 ***	0.004
Constant	−0.009 ***	−0.008 ***	−0.005 ***	−0.007 ***	−0.009 ***
EC	0.0000551	−0.000192 *	0.0000334	−0.000103	−0.000236 **

Notes: Y is the economic growth, L is the labor, K shows the capital, OP is oil price, FD is financial development and TO stands for trade openness. EC is the error correction term. *, **, *** represents the level of significance at 10%, 5% and 1%.

As far as Model 4 is concerned, where trade openness is added as an independent variable in Model 1, it can be seen that the impact of labor, as well as capital on economic growth, is insignificant. However, trade openness is significantly and positively related to economic growth at a 1% level of significance. The coefficient for trade openness is 0.018 suggesting that if trade openness increases by 1%, economic growth increases by 0.018%. Considering Model 5, where all variables are added to the equation to check combined impact, it can be noted that in this model, labor and capital are insignificantly related to economic growth. However, the oil price is significantly and positively related to economic growth at a 5% level of significance. The value of the coefficient for the oil price is 0.010 showing that a 1% increase in oil price increases the economic growth by 0.010%. whereas, both financial development and trade openness are insignificantly related to economic growth.

4.4.5. After Vision 2030 Estimation

To fulfill the second objective of this study, vector error correction is applied on the second set of data which is from 2017 after the introduction of vision 2030, and the results are presented in Table 9. It can be seen that in Model 1 where only labor and capital are added in the equation, both of these variables are significantly and positively related to economic growth at a 1% level of significance. The value of the coefficient for labor is 0.176 which means labor increases by 1%, and economic growth increases by 0.176%. As far as capital is concerned, its coefficient is 0.041 which is an indication that economic growth increases by 0.041% if capital increases by 1%. In Model 2, oil prices are added to the basic model and in this model, labor is again significantly and positively related to economic growth at a 5% level of significance. The value of the coefficient for labor in Model 2 is 0.105 which means if labor increases by 1%, economic growth increases by 0.105%. However, capital is significantly and negatively related to economic growth at a 1% level of significance with a coefficient value of 0.049. This means a 1% increase in capital results in a reduction of economic growth by 0.049%. As far as the oil price is concerned, it is significantly and positively related to economic growth at a 1% significance level with a coefficient value of 0.005. For oil prices, the coefficient value is 0.005 which is significant as well as positive at a 1% level of significance. This suggests that a 1% increase in oil price results in a 0.005% increase in economic growth. As far as Model 3 is concerned, financial development is added to the equation. In this model, only labor is significantly and positively related to economic growth at a 10% level of significance. The value of the coefficient for labor is 0.167 which indicates that a 1% increase in labor increases economic growth by 0.167%.

Table 9. Vector error correction after Vision 2030.

	Model-1	Model-2	Model-3	Model-4	Model-5
ΔY	1.102 ***	0.883 ***	0.943 ***	0.833 ***	1.033 ***
ΔL	0.176 ***	0.105 **	0.167 *	0.0453	0.312 *
ΔK	0.041 ***	−0.049 ***	0.020	−0.065 ***	−0.009
ΔOP		0.005 ***			0.068 **
ΔFD			−0.195		−0.771
ΔTO				0.004 *	0.148 **
Constant	−0.053 ***	−0.043 ***	−0.002	−0.047 ***	0.015
EC	−0.0000922 *	−0.000695 ***	0.000029	−0.000364 ***	−0.000625 *

Notes: Y is the economic growth, L is the labor, K shows the capital, OP is oil price, FD is financial development and TO stands for trade openness. EC is the error correction term. *, **, *** represents the level of significance at 10%, 5% and 1%.

Turning attention to Model 4, trade openness is added to the equation with labor and capital. In this model, labor is insignificantly related to economic growth whereas capital is significantly and negatively related to economic growth with a 1% level of significance. The coefficient for capital is 0.065 showing that a 1% increase in capital results in a 0.065% decrease in economic growth. Similarly, trade openness is significantly and positively related to economic growth with a coefficient value of 0.004. This highlights the fact that if trade openness increases by 1%, economic growth increases the economic growth by 0.004%. Considering Model 5 where all variables are added together, it can be seen that labor is significantly and positively related to economic growth with a value of coefficient 0.312 at a 10% level of significance. This means if labor increases by 1%, economic growth increases by 0.312%. The relationship between capital and economic growth is insignificant. However, the oil price is significantly and positively related to economic growth at a 5% level of significance. The coefficient for the oil price is 0.068 suggesting that a 1% increase in oil price increases economic growth by 0.068%. Financial development is not related to economic growth in this model but trade openness is significantly and positively related to economic growth with a coefficient value of 0.148 and a significance level of 5%. This means a 1% increase in trade openness increases economic growth by 0.148%.

4.5. Non-Linear ARDL

In this section, we do the asymmetric analysis to examine the response of economic growth on positive and negative shocks in independent variables, as mentioned in Table 10. For labor and capital the results are positive and significant for full sample analysis, before VAT, after VAT, before Vision 2030 and after Vision 2030. However, the negative shocks of labor and capital are insignificant.

The interesting findings are for oil price, financial development and trade openness, which contradict most of the previous studies [46]. The positive and negative shocks of oil prices are harmful for long run sustainable economic growth, mentioning that the change in oil prices decrease the economic activities in Saudi Arabia.

Focusing the long run estimations of financial development, the positive shocks report the negative coefficients which indicate that higher financial development is not guaranteed for sustainable economic growth in Saudi Arabia. The startling results point towards numerous financing issues, such as: (i) the mechanism of private financing is focusing short-term objectives. A higher proportion of private financing is given to retail sectors, whereas, a small portion is utilized by manufacturing industries and entrepreneurs, as shown in Figure A1, Appendix A. (ii) The finance sector is not sufficiently mature to participate a positive role in economic development.

Table 10. Non-linear ARDL estimation.

Full Sample				
	Long Run (+)	Long Run (−)	Long-Run Asymmetry	Short-Run Asymmetry
L	0.959 ***	−6.294	0.001	0.033
K	0.307 ***	0.090	39.650 ***	0.383
OP	−0.071 ***	−0.053	16.010 ***	4.550 **
FD	−4.544 ***	7.539 ***	2.941	7.195 ***
TO	−0.383 ***	−0.060	35.940 ***	5.075 **
Before VAT				
L	0.615 ***	0.002	33.340 ***	4.201 **
K	0.473 ***	0.012	83.510 ***	0.003
OP	−0.046 ***	−0.085 ***	26.400 ***	2.124
FD	−3.868 ***	9.174 ***	6.786 ***	1.000
TO	−0.624 ***	0.151 *	60.220 ***	5.284 **
After VAT				
L	0.108	−0.474	0.935	0.238
K	0.110	2.050	215.000 ***	12.250 ***
OP	0.037	−0.060 *	0.344	1.579
FD	−2.381 **	2.052 **	1.050	0.774
TO	−0.475 ***	0.201 **	6.140 **	2.649
Before Vision 2030				
L	0.566 ***	0.007	32.910 ***	41.930 ***
K	0.496 ***	−0.072	71.540 ***	1.704
OP	−0.079 ***	−0.220 ***	63.620 ***	6.429 **
FD	0.230	11.826 ***	30.070 ***	0.031
TO	−0.647 ***	0.114	93.360 ***	4.849 **
After Vision 2030				
L	−3.027	12.705	0.612	0.102
K	4.667	0.005	2.230	0.254
OP	−0.633 ***	−0.297	1.369	7.438 **
FD	24.609	−6.734	1.511	1.091
TO	1.832 ***	0.692	3.025*	2.438

Notes: Y is the economic growth, L is the labor, K shows the capital, OP is oil price, FD is financial development and TO stands for trade openness. EC is the error correction term. *, **, *** represents the level of significance at 10%, 5% and 1%.

In nonlinear analysis, the positive shocks in trade openness decreases the economic growth in all samples, except after-Vision 2030. The results confirm the Heckscher–Ohlin (HO) theory which argues that capital-intensive production countries face a number of economic issues, such as unemployment, which further affects other economic indicators. However, as the exports of Saudi Arabia are mostly capital intensive, they rely heavily on imports of capital and personal goods. In such scenario, the local industries have less opportunities to compete in market which is a major hurdle in industrialization. As a result, the trade openness is not guaranteed for sustainable economic growth. However, a positive sign is witnessed for after-Vision 2030 which shows that the Saudi government

has attempted to take significant actions to counter this issue. It is a sign of successive structural change in the Saudi economy which deliver a positive result.

4.6. Discussion

The main purpose of the current study is to investigate the effect of VAT on the economic growth of Saudi Arabia. For this purpose, data are divided into two parts, before VAT and after VAT, to check how this transformation helped the Saudi Arabian economy to achieve sustainable growth. Results of a vector error correction model (VECM) model regarding the three sets of data including full sample, before VAT and after VAT, provide some interesting and valuable information for policymakers. The results regarding the effect of labor on economic growth show that before VAT, labor affects the economy positively, however, after VAT, in a majority of models, the effect of labor is insignificant but negative. The main reason behind this is the fact that the government imposed a high labor fee during transformation which was borne by the companies. The high labor cost results in increased production costs of the companies which in turn affects the economy adversely. During the period of transformation, a minimal number of expats remained in the country hence demand decreased which affected the economy negatively. Another reason could be the increased price of goods and services due to VAT which results in decreased consumption because, in the case of inflation, foreign labor usually preferred remittances instead of consumption on high-priced goods; hence, this decreases the demand for goods and services which ultimately affects the economy negatively [47].

Considering the estimations for capital, it is worth noting that capital has no role in defining economic growth. Before VAT estimations also confirm the insignificant impact of capital. By contrast, the capital shows a positive and significant impact for After-VAT estimations, mentioning that an increase in capital leads to an increase in economic growth. However, it seems clear that in the after-VAT period, Saudi Arabia needs higher capital to attain sustainable economic growth. The significant impact of capital on economic growth can be explained through the transformation of business structure; previously, firms usually hired cheap labor for processing, instead of technology adoption. However, after the surge in expats labor fees and Saudization urged the owners to reform their business structure to increase profit, the firms moved towards automation which required huge capital amounts and less dependency on labor. Through this modification, the firms have to invest capital to maintain their production and profit which leads towards sustainable economic growth [9].

It is a fact that to reduce the reliance on oil exports, VAT has been introduced as oil prices are highly volatile, which destabilizes the budget of Saudi Arabia. To counter these oil price shocks, the Saudi government introduced VAT to reduce the reliance on oil exports and this was done to attain sustainable economic growth. In doing so, the effect of oil prices on economic growth became insignificant, as reported in model-5 after VAT estimation.

In the case of financial development, the findings vary across VAT; the coefficients are insignificant and positive, before VAT and after VAT estimations, respectively. This change in the significance of financial development is because, after major transformation decisions in 2017, financial development started playing a role to enhance private investment which is necessary for economic growth. The surge in financial development further promotes investment opportunities which witness a transformation, from saving to investment, to boost economic activities. However, due to the increase in investment, the real sector and non-oil exports flourish, which affects the economy positively [48].

Although trade openness is reporting mixed results, after the implementation of different transformation activities including VAT and Vision 2030 the impact of trade openness becomes highly significant and positive on economic growth. Hence, it can be said that economic transformation has started playing a positive role in the economy by regulating trade activities with other countries.

As far as the results regarding vision 2030 are concerned, it is noted that the role of labor, as well as capital, became significant in the economic growth of Saudi Arabia

after reforms in 2016. The main reason was the introduction of comprehensive reforms to increase the number of graduates in the country and also to match the needs of the education system with the labor market. However, the impact of the oil price on economic growth was significant and positive before and after Vision 2030. This shows that until now, the reforms do not demonstrate any impact in terms of reduction of economic reliance on oil, which is a point of concern for policymakers. In the case of financial development, there is no difference between the relationship with economic growth, and it is noted that financial development does not have any role in the economic development of Saudi Arabia. Considering trade openness, it is found that trade openness has been playing an important role after Vision 2030. This shows that trade openness is an important factor for the Saudi economy and economic transformation does not impact the importance of trade openness for the Saudi economy.

5. Conclusions

The study reexamined the role of labor, capital, oil dependence, financial development, and trade openness to achieve sustainable economic growth in the Saudi economy. The main motive of the study was to evaluate the impact of VAT implementation on the Saudi economy which mainly depends on oil exports. The findings conclude that there has been a significant transformation in economic structure, such as the higher dependence on capital, instead of labor, which is proved by the insignificance of labor and significance of capital, since the introduction of VAT. Financial development and trade openness turn out to be more reliable factors for attaining sustainable economic growth.

The study provides a number of policy suggestions which assist in attaining sustainable economic growth. Saudi Arabia must diversify its export portfolio by exporting non-oil products, such as technological goods, as well as oil products. There is a need to revise private credit policies through financing entrepreneurs and industries. The modification in private financing policies can uplift industrialization which further boosts employment and exports. As a result, financial development participates in achieving sustainable economic growth. The findings of trade openness are useful to understand the dynamics of the Saudi capital-intensive economy, however, it is recommended that Saudi Arabia incentivizes its local production to decrease the dependence on imports. This action will have multiple outcomes, such as increasing employment opportunities, decreasing import bills, and significant economic growth. For sustainable economic growth, just increasing value-added tax is not enough but other measures are also necessary to reduce the harmful effects of VAT including inflation, etc. As far as the Vision 2030 is concerned, it is a positive sign that a majority of the factors are starting to play their role in the economic growth of the country. However, as the main motive for economic transformation is to reduce the reliance of the Saudi economy on oil and petroleum products, it is noted that economic growth is still dependent on oil prices. Hence, it is advised that policymakers should make efforts to promote other sectors including tourism and industrial sectors.

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Appendix A

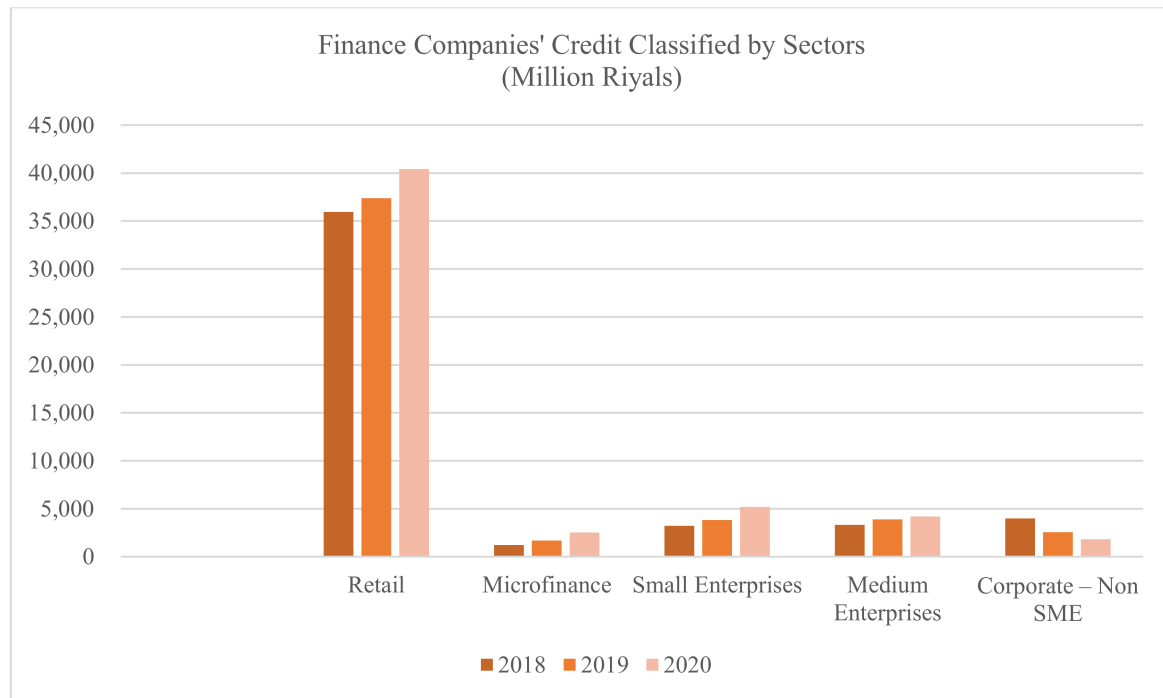


Figure A1. Finance companies' credit classified by sector.

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