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GROWTH ACCOUNTING FOR SAUDI ARABIA

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ABSTRACT

Saudi Arabia is a capital and energy-intensive economy and also dependent on expatriate labor. With the recent fall in oil prices, the Kingdom is actively pursuing structural transformation. The study identifies a research gap in estimating the contribution of labor and capital to the Saudi Arabian economy. This study focuses on estimating the relative contribution of major long-term determinants of economic growth. With the support of the auto-regressive distributed lag model (ARDL), the study establishes a co-integrating relationship between real gross domestic product (GDP), investment expenditure, labor force and education expenditure in Saudi Arabia. The study notices that the maximum contribution to real GDP growth in Saudi Arabia is from the labor force. The minimum contribution to real GDP growth comes from investments in the predominant oil sector. This study identifies the mechanisms to make the localization program successful. The study recommends further diversification in productive sectors to gain benefit from new investments and suggests cutting down the unproductive expenditure in education.

Contribution/ Originality: This study is one of the very few studies which have investigated the contribution of capital and labor to the economy of Saudi Arabia. In addition, by incorporating education expenditure into the model, it also studies the role of education in light of the Saudization program.

1. INTRODUCTION

Growth accounting is about segregating down the total output of an economy into the contribution from each input like labor and capital. The modern analysis of long-term economic growth and productivity started with Solow (1956:1957) model. However, Solow identified that the two factors of production namely, labor and capital, did not explain output fully for the United States. He interpreted the unexplained part of output as a technical change or total factor productivity (TFP). Later, new theories by Romer and others emphasized the role of education and research for the development process. Investments in education not only have a positive effect on the firm but also have spillover effects for other firms. These externalities affected the entire economy. The objective of this study is to identify the major long-term determinants of economic growth in Saudi Arabia during the last two and half decades in light of Solow and Romer's models.

The early studies of Solow (1962) on United States, Abramovitz (1956) on United States, Denison (1962) on United States & North west Europe, found that the contribution of labor is more than that of capital. However Maddisson (1970); Robinson (1971) in their respective studies on sample of developing countries found that the

contribution of capital is more than that of labor. There have been quite a few studies to measure the relative contribution of capital and labor in an economy (Saidu *et al.*, 2018). In a related study (Edo, 1988) found that labor contributed more than capital in Nigeria. But there is a research gap in terms of studying the relative contribution of capital and labor for Saudi Arabia. The authors could not find a similar study on Saudi Arabia except for Mahmood and Alkahtani (2018). Also, it is important to estimate whether the educational performance of the Kingdom is sufficient enough to avoid the transitional effects of the policy of Saudization of the workforce. Saudization refers to replacing the expatriate labor force with domestic labor. This would be an important contribution of the current study.

Saudi Arabia's manufacturing structure is largely dependent on capital and energy intensive oil sector (El Gammal and El-Bushra, 1986). Oil production is primarily a capital intensive industry and engages moderately few laborers (Baur, 2014). An important factor that impacts the supply of oil is the depletion of existing oil wells. Therefore, oil producing economies have to keep on drilling new wells not only for meeting increased demand but also to make up for the lost oil wells. Studies have identified quite a few distinct features of investments in oil-centric economies like long planning horizons, non-reversibility, variable price of the output, price effects investment after several lags, high sunk costs (Dixit and Pindyck, 1994; Favero and Pesaran, 1994). Also, as Saudi Arabia depends primarily on oil production and export, it is impacted hugely by the instability of oil prices (Sallam and Neffati, 2019). Therefore there is an uncertainty in oil demand and prices leading to low investments. Other studies have identified excess capacity in the oil sector as a major investment deterrent (Jojarth, 2008). Nevertheless, capital investment is required to both sustain and increase production to meet rising global demand.

Labor, the other factor of production, has a distinct structure in Saudi Arabia. It is acknowledged that the labor market participation for Saudi Arabia is less when compared to similar economies with more or less of the same per capita income and similar phase of economic developmental stage (Al-Asmari, 2008). Also, it is opined that in the long-term, oil and other natural resource rent seeking countries influence unemployment definitely (Fattah, 2017).

Saudi Arabia is thinly populated with a population density of around 15 people per square kilometer. Its labor force is unable to meet the demands of this economy. As local manpower is not sufficient, a major share of the labor market consists of expatriates. The labor force in the private sector has around 84% non–Saudis as out of the total labor force of 10020107 in the private sector, 8470139 were non-Saudis. As far as the public sector is concerned, the share of non-Saudi workers is only around 5%. In 2014, the total labor force was 1240748 and only 72162 were non-Saudis, but the public sector employs only around 11% of the total labor force (SAMA, 2016).

It is important to stress that without these foreign workers these economies of the oil states could not have functioned at the levels deemed necessary by their governments. In addition to meeting the labor shortage, a labor importing country derives other important economic benefits. Foreign labor has often already received its training in the worker's country of origin. A labor receiving country would not have to incur the cost of human capital formation. Foreign workers also tend to accept lower wages and longer working hours. They also tend to have a relatively high rate of turnover, thus enabling employers to exploit them to the peak of their productivity (Alnasrawi, 1991).

The benefits of expatriate labor include the resulting additional demand for consumer goods and source of human capital but the potential issues are remittances, crowding out of the local workforce, increased government expenditure and cultural issues (Mohamed, 2013). Skilled labor migration is important for growth, competitiveness and networking and is crucial for the development of world cities (Beaverstock, 2012). The International Labour Organization (2015) identified immigrants as the key contributors for growth of both the country of labor origin and the host country. The major charge against using foreign labor is remittances. Studies have even attributed the unemployment in Saudi Arabia to foreign labor (Alkhateeb *et al.*, 2017). But if at all this labor market phenomenon has to be cured then a great education system is required which not only provides quality education but also produces employable graduates.

Human capital is now considered as an input in the production function however economies which invest in education develop faster (Barro and Sala-i-Martin, 1995). Saudi Arabia has invested exceptionally well in education. There were only three public universities in 1970 and there are thirty now. Amongst these, sixteen universities were established during the last decade. The other thirteen private universities, are spread all over the country (MOE, 2018). As per the data made available by SAMA (2016) the number of students in general education increased from 2736558 to 5207728 between the period from 1991 to 2014; the number of new students in higher education increased from 83375 to 389586 over the period from 1996 to 2014; and the number of students in technical education and vocational training increased from 70075 to 116036 over the period from 2007 to 2014.

In this respect, the study aims at studying the relative contribution of the growth in labor force, investments and education expenditure to the growth of the real GDP of Saudi Arabia. The whole paper is organized as follows: the literature review is followed by a section on the methodology used, the empirical results, discussion, and finally, the conclusion.

2. REVIEW OF LITERATURE

The theoretical basis of this study comes from the neoclassical growth theories. In his pioneering work, Solow (1956) attributed economic growth to two factors namely, capital and labor. The main implication of the Solow growth model is that if there is no growth in productivity, the economy may reach a steady state in the long-term. In this regard, the economy's output per worker, consumption per worker, and capital stock per worker do not change over time. But there was a significant residual term in Solow's estimation. This residual is credited to technical progress. It postulated a continuous production function associating capital and labor to output leading to the steady state equilibrium. It meant that the process of growth was stable. It didn't matter where the economy started. On the other hand, there were forces which would push the economy to a steady state. This implied that there would be convergence, wherein one economy would catch up with the other economy. Hence, growth here was taken to be exogenous.

Interestingly, Solow's model came under criticism as things like quality and skills of labor and investments in education and research were ignored. Later, the New Growth Theory emerged and overcame this criticism. The first proponent of this new growth theory was Arrow (1962). He introduced the concept of learning by doing and regarded it as endogenous to the process of growth. He hypothesized that new capital goods included all the available knowledge till that time, based on accrued experience.

Romer (1986) focused on learning by investment. He considered knowledge as an input in the production function. Lucas (1988) also proposed that investments in education led to the formation of human capital which was essential for economic growth. He emphasized internal effects of human capital which refer to an increase in the productivity of worker and external effects. It increased the productivity of capital and all other workers in the economy too. Later, Romer (1990) discussed a research sector which worked towards the development of new ideas. He even considered ideas to be more important when compared to natural resources.

Stadler (1990) opined that labor has the capability to learn and can acquire a new set of skills. With more laborers, there is a more intensive use of the fixed factors in the short-term, which leads to a reduction in waste and bottlenecks. Historically, the Solow model and the new growth theory propounded by Romer and Lucas are two key economic theories that have been the basis for most studies on economic growth. Numerous studies have tried to study the determinants of economic growth using neoclassical and new growth theory (Huh and Kim, 2013; Saidu *et al.*, 2018).

Samany and Zahidi (2017) opine that the MENA region captures only 62% of its full human capital as compared to the 65% global average and Saudi Arabia has the highest availability of local high skill jobs. Investment in education is synonymous to improvements in human capital as it leads to the achievement of socio-economic potential of the human folk (Kamdar, 2017). Haque and Khan (2019) reported that government

expenditure on education is the chief contributor to human development in Saudi Arabia. Student enrollment has increased over years in the overall MENA region which includes Saudi Arabia but studies have found an inverse association between the male labor participation rate and education attainment (Dandan and Marques, 2017). The governments provide free education in MENA countries, but studies have pointed out a huge inequality of opportunities and also questioned the quality of education as compared to European and Latin American countries (Isfahani *et al*., 2014).

In a study on relative contribution of labor and capital on Nigeria by Edo (1988) the results indicate that labor with coefficients of 0.58 in the long-term, contributed more to economic growth than capital with coefficients of 0.25 in the long-term. We searched for growth accounting studies for Saudi Arabia. We found quite a few studies in this context. Mahmood and Alkahtani (2018) attempted to study the effect of human resources and financial market development on the growth of Saudi Arabia. They used data from 1970-2017 and applied the ARDL method for cointegration. The study found that labor and capital contributed to both long-term and short-term economic growth. A one percent increase in capital led to an increase of 0.57 percent in GDP per capita while a one percent increase in labor led to an increase of 0.56 percent in GDP per capita. The study recommended emphasis on human capital and further investments in education. Apart from this study, to the best of author's knowledge, there is no other study on Saudi Arabia is available in this respect.

In other related studies on Saudi Arabia, Tnse (2007) studied the relationship of growth with domestic demand, investment, and exports. Al-Yousif (2008) studied the relationship of growth with expenditure on education and economic growth. Dandan (2013) studied the relationship of growth with educational expenditure. Ageli (2013) studied the relationship of growth with education expenditure. Abdalla and Abdelbaki (2014) studied the relationship of growth with exports and gross capital formation. Eid (2015) studied the relationship of growth with government consumption expenditure and government gross fixed capital expenditure. Alodadi and Benhin (2015) studied the relationship of growth with exports, investments, government expenditure, private investments, and religious tourism. Hafnida and Abdullah (2016) studied the relationship of growth with financial development, government expenditure, investment, and net export. Sillah (2015) studied the relation of growth with fixed capital formation, labor, FDI, students enrolled in higher education, domestic R&D expenditure. Esmail (2015) studied growth's relationship with exports, imports, FDI, labor and oil revenue. Altaee *et al.* (2016) established a relationship of growth with gross fixed capital formation, export, import, and financial development. Bokhari (2017) studied growth's relationship with government expenditure on education, government expenditure on health and gross fixed capital formation.

3. DATA AND METHODOLOGY OF THE STUDY

In the light of theoretical discussions and results of empirical research, several studies have attempted to identify the major factors that impact economic growth. This study proposes to use both the Solow and New Growth Theories to study the growth of Saudi Arabia. There are two sources of data on the variables used in this study. Data on the real GDP, education expenditure, and investment expenditure have been compiled from the official website of the Saudi Arabian Monetary Authority (SAMA). Data on the labor force in Saudi Arabia is compiled from the official website of the World Bank which publishes data on World Development Indicators of various countries including Saudi Arabia. The period of study is from 1991 to 2014.

This study attempts to analyze the relationship of economic growth with three possible determinants in Saudi Arabia. Economic growth is measured in terms of growth in real gross domestic product. The annual growth in the real GDP is taken as dependent variable. Three variables namely labor force, investment expenditure and education expenditure are included as independent variables. Between the period1991 to 2014 the gross domestic product (GDP) has grown from 495176 to 2836314 million riyals; investments have grown from 100480 to 714253 million

riyals and education expenditure has grown from 33826 to 199370 million riyals (SAMA, 2016). During the same period the labor force has also grown from 5202460 to 12391396 (World Bank, 2016).

Many techniques can be used to study the relationships in time series data. The most elementary is the method of regression. But this method of regression can only be used if the data is stationary at one level. Normally, time series data is not stationary at one level and does have a unit root. If there is a unit root at the level and the data turns stationary on first differencing, then the method of cointegration is considered more suitable. Dickey-Fuller is one of the common tests used for testing stationarity. All the three variants of stationary tests, that is, constant; constant with the linear trend; and none are tested on each variable. Once it is established that the data has a unit root, we proceed with cointegration.

The most popular method of doing cointegration is given by Johansen (1988). But Johansen's method has a precondition that all the variables should be integrated by the same order. Initial investigation revealed that GDP, investment and education were stationary at the level, but variable labor was stationary at first difference. All the data was rechecked for stationarity using the Philips Perron test. These tests were conducted using EViews 6. As the data was integrated at different levels, an alternative method of finding cointegration among variables by the name of Autoregressive Distributed Lag (ARDL) method developed by Pesaran *et al.* (2001) was used. It also needed to be ensured that there was no variable which turned stationary after differencing twice as in this case, it then would not be permissible to conduct the ARDL model. Researchers also claimed that this method performed better than Johnson's method when the sample size is small (Haque and Sultan, 2012).

The basic ARDL model is:

$$\Delta G_t = \beta_0 + \sum \beta_i \Delta G_{t-i} + \sum \gamma_j \Delta I_{t-j} + \sum \delta_k \Delta L_{t-k} + \sum \delta_k \Delta E_{t-k} + \theta_0\ G_{t-1} + \theta_1 I_{t-1} + \theta_2 L_{t-1} + \theta_3 E_{t-1} + e_t$$

Where, $\Delta G_t = \beta_0 + \sum \beta_i \Delta G_{t-i}$, G is GDP, I is investment, L is labor force and E is education expenditure. After estimating the model using sample data on the included variables, F-test is performed for the following null and alternate hypothesis:

$$H_0: \theta_0 = \theta_1 = \theta_2 = \theta_3 = 0$$

$$H_1: \theta_0 \neq \theta_1 \neq \theta_2 \neq \theta_3 \neq 0$$

If the null hypothesis is not accepted, the possibility of a long-term cointegrating relationship is excluded. The table values are taken from Pesaran *et al.* (2001) which gives both upper and lower bounds on the critical values. If the calculated F value is more than the upper bound, it indicates that there is cointegration and if the calculated F value is less than the lower bound, there is no cointegration. If the calculated F value is between the two bounds, the result is inconclusive. Once statistical proof of cointegration is established, the long-term equilibrium relationship is also established by regular OLS estimates and Error Correction Model (ECM) by the following equations:

$$G_t = \alpha_0 + \alpha_1 I_t + \alpha_2 L_t + \alpha_3 E_t + v_t$$

$$\Delta G_t = \beta_0 + \sum \beta_i \Delta G_{t-i} + \sum \gamma_j \Delta I_{t-j} + \sum \delta_k \Delta L_{t-k} + \sum \delta_k \Delta E_{t-k} + \varphi z_{t-1} + e_t$$

Where $Z_{t-1} = (G_{t-1} - a_0 - a_1 I_{t-1} - a_2 L_{t-1} - a_3 E_{t-1})$, and the a's are the OLS estimates of the α's

The long-term coefficient for I is -(θ_1/θ_0), L is -(θ_2/θ_0), and E is -(θ_3/θ_0). The error correction term (ECT) indicates the amount of disequilibrium in the short-term which is corrected over one period of time. This error correction term should be negative and significant.

Finally, the model was subjected to diagnostic checks. We first used the Jarque-Bera test for checking for normality. The null hypothesis is that the data follows a normal distribution. The second test was the Breusch-Godfrey Serial Correlation LM Test for serial correlation. Here, the null hypothesis is that there is no serial correlation. Third, we used the Ramsey RESET test to check for misspecification in the model. Here, the null hypothesis has no misspecification. Then, we used Breusch-Pagan-Godfrey to test for heteroscedasticity. Here, the null hypothesis is that the error variance is homoscedastic. For all these, the acceptance of the null hypothesis was desirable which is indicated by a p-value of more than 0.05 as we tested at 5% level of significance. Lastly, we used the CUSUM test for parameter stability. It checks for the stability of residual wherein the plot of coefficient lies within the 5% critical bounds.

4. DATA ANALYSIS AND RESULTS

When the Dickey-Fuller and Phillips-Perron tests were administered, the variables GDP and education were stationary at level and the variables investment and labor were stationary at first difference as shown in Table 1. A lag of 2 was taken for developing the model as suggested by sequential modified LR test statistic and Schwarz information criteria table values in Table 2. It was found that all the variables were stationary either at the level or at first difference. Hence, we proceeded with the Bounds test using Wald's test. The value of F-statistic from Wald's test was 4.45 as shown in Table 5. The lower and upper bounds of the F-test statistic (using Pesaran *et al.* (2001)) at the 5% significance levels were 3.23 and 4.35. As the value of F statistic (4.45) was more than the upper bound value (4.35), it indicated the presence of a long-term cointegrating relationship between the variables as shown in Table 3.

Table-1. Unit Root Tests.

Variables	Testing procedure	ADF		Phillips-Perron	
		Level	First Difference	Level	First Difference
G	Constant	-5.14*	-5.96*	-5.14*	-14.91*
	constant, linear trend	-5.51*	-5.72*	-8.20*	-15.41*
	None	-3.96*	-6.14*	-3.96*	-15.92*
I	Constant	-2.82	-6.27*	-2.91	-6.62*
	constant, linear trend	-3.21	-6.09*	-3.22	-6.68*
	None	-2.23	-6.43*	-2.25	-6.81*
L	Constant	-1.86	-5.46*	-1.86	-5.51*
	constant, linear trend	-3.09	-5.31*	-3.10	-5.35*
	None	-0.45	-5.58*	-0.35	-5.59*
E	Constant	-11.60*	-6.44*	-11.60*	-43.20*
	constant, linear trend	-11.61*	-6.17*	-11.81*	-38.37*
	None	-9.66*	-6.62*	-8.29*	-46.58*

* indicates significance at 5% significance level.

Table-2. Lag Structure.

Lag	LR	FPE	AIC	SC	HQ
2	5.23*			6.21*	
4		22.41*	5.86*		5.90*

*indicates the appropriate lag structure.

Table-3. Bounds Test.

F-statistics	Significance Level	Bound Critical Values	
		I(0)	I(1)
4.45	5%	3.23	4.25

Source: Author's calculation using EViews.

The coefficient terms of the long-term estimations were taken from unrestricted ECM in Table 4. The long-term multiplier between investment expenditure growth and real GDP growth was estimated as 0.006 (-0.01/-1.64). The long-term multiplier between labor force growth and real GDP growth was found to be 1.57(2.58/1.64). The long-term multiplier between education expenditure and real GDP growth was 0.06 (-0.10/-1.64).

An increase of 1 percent in investment will lead to an increase of 0.006 percent in real GDP in the long-term. An increase of 1 percent in labor force will lead to a 1.57 percent increase in GDP and an increase of 1 percent growth in education expenditure will lead to 0.06 percent growth in real GDP. Hence, it was clearly evident that the main resource for economic growth in Saudi Arabia is the labor force followed by education expenditure and investment expenditure.

Table-4. Long-term Coefficients From Unrestricted Ecm.

Variables	Coefficient	p-value
Constant	-3.95	0.11
G	-1.64	0.006
I	0.02	0.008
L	2.58	0.01
E	0.10	0.005

Source: Author's calculation using EViews.

Table-5. Walds Statistic.

Test Statistic	Value	P-Value
F-statistic	4.45	0.03
Chi-square	17.81	0.00

Source: Author's calculation using EViews.

Table-6. Restricted Vecm.

Variables	Coefficient	Prob.
C	0.23	0.77
D(G(-1))	0.34	0.41
D(G(-2))	0.39	0.21
D(I(-1))	0.05	0.66
D(I(-2))	-0.10	0.35
D(L(-1))	-0.19	0.89
D(L(-2))	-3.58	0.01
D(E(-1))	0.03	0.62
D(E(-2))	-0.02	0.68
ECT(-1)	-0.32	0.02

Source: Author's calculation using EViews.

Table-7. Diagnostic Checking.

Test Statistics	Coefficient	P-Value
Jarque-Bera	0.44	0.80
Breusch-Godfrey Serial Correlation LM Test: F-statistics	0.01	0.99
Ramsey RESET Test: F-statistic	1.83	0.21
Heteroskedasticity Test: Breusch-Pagan-Godfrey F-statistics	0.59	0.78

Source: Author's calculation using EViews.

Next, we estimated the OLS model and constructed the residual serial to fit the restricted ECM. The short-term coefficient of all three variables was not significant at lag 1. Labor was significant in the short-term at lag 2. The estimated ECT term was found to be negative and statistically significant, as required and shown in Table 6. 32% of disequilibrium from the long-term equilibrium was corrected every year. Finally, the model was subjected to a diagnostic check. The model was tested for normality, heteroscedasticity and serial correlation. The results indicated that there were no issues as shown in Table 7. To check the stability of long-term parameters, the

cumulative sum (CUSUM) and cumulative sum squares (CUSUMSQ) tests were done. The CUSUM test indicated that the model was stable as the plot of CUSUM statistics fell within the 5% significance level as shown in Figure 1.

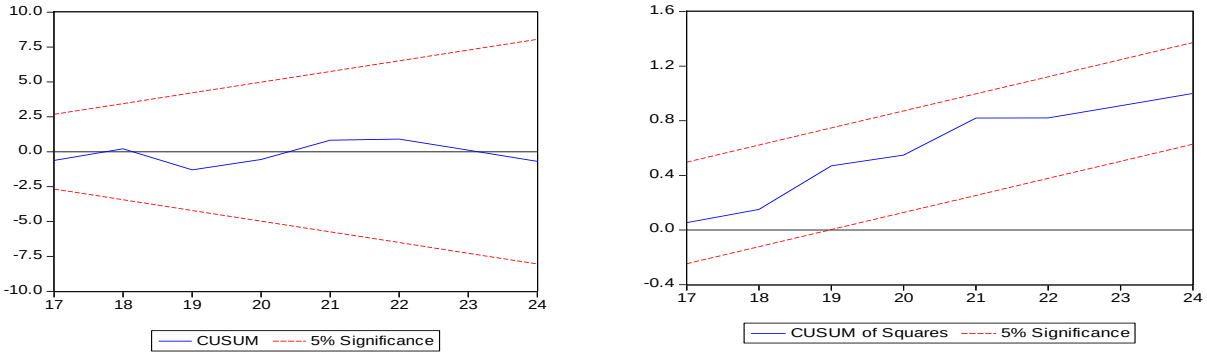

Figure-1. Stability Test.

5. CONCLUSIONS

The results indicated that there is a co-integrating relationship between real GDP, investment expenditure (GFCF), labor force and education expenditure. Adding education to the model incorporates the elements of New Growth Theory. It attaches more importance to the role of education, research and development expenditure than labor force or on capital. A disturbing revelation of this study is that the long-term investment multiplier has the lowest magnitude. A one percent increase in investment leads to only 0.006 percent increase in real GDP. A possible reason for this could be that the oil sector is already saturated with capital investments and any further increase in the investment must focus on the non-oil sector in order to be more productive to boost economic growth. Therefore one recommendation is that diversification must be promoted vigorously.

The multiplier for education is also small as an increase of one percent in education expenditure leads to an increase of only 0.06 percent in the real GDP. A possible explanation for this is that there is generally a lag period between the starting of investment in education and seeing the outcome of that investment. In recent years Saudi Arabia has invested heavily in education which may not be contributing much to the growth of GDP but will surely boost its economic growth once the gestation period is over. Merely increasing education expenditure does not guarantee that it will automatically improve the quality of education provided to the people. Unnecessary expenditure should be controlled. A low contribution of education expenditure to real GDP indicates that unproductive education expenditure could be occurring. The multiplier for the labor force is more than one. An increase of one percent growth in the labor force leads to 1.57 percent growth in the real GDP which indicates that labor is more productive than capital for Saudi economy. This creates an important policy dimension.

Saudi Arabia has recently launched a major structural reformation plan, a major aspect of which is attracting investments and the Saudization of the labor force. The GCC has been trying to replace expatriates with a local workforce but the results are mixed. It is an important socio-economic challenge. One obstacle to Saudization is that cheap foreign labor has substituted for technological improvements leading to low productivity. Additionally, the public sector has already absorbed the maximum local workforce and stagnated. Saudization has happened "through quotas and prohibitions" (Hertog, 2012). Earlier studies have predicted that Saudization may negatively impact competitiveness and that it leads to disturbances in the form of 'short term transitional disruptions'.

Hence the emphasis should be on the implementation of Saudization without affecting economic growth. Building up a strong education system and training new and would-be employees is an important part of this strategy (Looney, 2004; Al-Dosary and Rahman, 2005). Saudization can address the issue of unemployment but is not yet effective, hence the country has to continue importing quality human capital. As a policy recommendation, the studies calls for "prioritizing relevant education through academia-industry integration" (Ali *et al*., 2018).

The results of this study contradict the results of Mahmood and Alkahtani (2018) as the current study assigns a greater role to labor in the economic growth of Saudi Arabia. However, a major policy recommendation which emerges from this study is that for the process of Saudization to be successful, the efficiency of the education system is important. Up until now production was done mainly by the expatriate labor and they have contributed greatly. If the country wishes to get the same returns from the domestic workforce then it has to make its workforce just as efficient which calls for, in part, cutting unproductive expenditure in education. Nevertheless, we cannot diminish the role played by investment and education in increasing productivity and growth in an economy. A detailed inquiry into the reasons for the smaller value of the multipliers for investment and education is required and can become the scope for further research. A major limitation of the study is the data. Owing to the unavailability of data on the education of the labor force, this study used data on education expenditure as a proxy for measuring the impact of education on economic growth. As education expenditure might not be strongly correlated with quantity and quality of education of the labor force, its impact is not fully reflected in the growth in the GDP. At the same time, it is reasonable to believe that the government's expenditure on education would not only add to the stock of physical infrastructure but also would raise the productivity of the labor force. These improvements in the labor force's education are likely to contribute to positive economic growth.

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