

I. Barro (1991, p. 430), for instance, argues that "expenditures on education and defense are more like public investment than public consumption; in particular, these expenditures are likely to affect private sector productivity or property rights, which matters for private investment." On the other hand, higher government spending may hinder overall economic performance if the spending comes at a cost of increased taxes and/or borrowing to finance the government expenditures. Fiscal policy is a key element of Saudi Arabia's macroeconomic policy given the importance of public expenditures in financing investment and consumption activities and their role in meeting the growing need for public social services. Available statistics show that total government expenditures increased from US\$1.6 billion in 1970 to US\$158.9 billion in 2010 (a 9,800 percent increase in nominal and 1,700 percent increase in real terms) in order to meet continuing increase in demand due to population growth and higher standards of living. Despite this fact, unemployment has remained high in recent years. This underlines the importance of the composition of government spending and how it could be altered to encourage private-sector-led growth and reduce unemployment. Although several empirical studies have examined the relationship between government expenditure and economic growth in Saudi Arabia, none of these studies has explored the relationship between different categories of government expenditures and economic growth. Therefore, the main objective of this paper is to empirically re-examine the impacts of different components of government expenditure on economic growth in Saudi Arabia. To this end, we use Vector Auto Regression (VAR), Cointegration, and Vector Error Correction Model (VECM) techniques to estimate the short- and long-run effects of these expenditures on growth and employ annual data over the period 1969–2010. The empirical findings indicate that while private domestic and public investments, as well as healthcare expenditures, stimulate growth in the long-run, openness to trade and spending in the housing sector can also boost the short-run production. The rest of the paper is organized as follows. Section II gives a brief background on the structure of Saudi Arabia's government expenditures. Section III provides a review of related literature. Section IV discusses our theoretical model, empirical methodology, and data. Section V presents the empirical results, and Section VI concludes with some policy implications.

## 5 II. BACKGROUND

Although Saudi Arabia is one of the fastest growing economies in the Middle East and North Africa,<sup>2</sup> its economy still depends heavily on the oil sector. Oil revenue accounts for roughly 90.0 percent of total government revenues, oil exports account for about 88.0 percent of total export earnings, and the oil sector contributes about 35.0 percent to GDP. Given the importance of public expenditures in financing investment and consumption activities, Saudi Arabia's fiscal policy plays a vital role in the economy. Saudi government activities may be divided into public investment, which is carried out by state-owned firms, and through government expenditures. The government expenditures consist of two types, current and capital. While the former includes wages, salaries, subsidies, transfers, and other expenses (i.e. consumption), the latter encompasses government spending on reinforcing human resources, providing social services and healthcare, developing economic resources, transportation and telecommunications, and increasing the availability of municipal and housing services.<sup>3</sup> Figure 1 shows the historical path of government expenditures in Saudi Arabia. As can be seen from the graph, the Saudi government allocated a large portion of its budget in the 1980s to capital spending, but with the decline in oil prices in late 1980s, capital

expenditure shrank significantly. 6 In order to achieve better economic performance, Saudi Arabia adopted deliberate planning and careful implementation of a development program with clear goals by introducing the First Development Plan in 1970. With this first attempt, Saudi government has started a series of five-year plans that continues today. As can be seen from Figure 1, in the first three Development Plans (1970–1984) the government focused on financing the projects needed for improvement of education, health, housing, transportation, and telecommunication services. Thus, capital expenditure was as large as current expenditure. During the Fourth and the Fifth Development Plans (1985–1994), oil revenues significantly declined as the global prices for oil slumped. This drop was followed by a decline in real government spending. Furthermore, most infrastructure projects were completed, thus further eroding the share of capital expenditure. Over the Sixth Development Plan (1995–99) the government's strategic plans focused on development of human resources. Actual expenditure on development sectors amounted to US\$112.1 billion of which US\$57.7 billion was spent on human capital development. The Seventh Development Plan (2000–04) further prioritized human capacity development. Total government expenditure amounted to US\$129.4 billion of which 57.1 percent was allocated to human capital development, 19.1 percent for social and healthcare development, and 12.6 percent for infrastructure. During the Eighth Plan (2005–2009), total government expenditure reached US\$230.4 billion of which 55.6 percent was allocated to human resources development, 18.0 percent for social and health development, 12.2 percent for economic resources, and 14.2 percent for infrastructure (see Figure 2). This pattern reflects the natural progress in the country's socio-economic development.

US\$ billion 7 III. LITERATURE REVIEW The empirical literature on the impact of government spending on economic growth may be grouped into two strands. While the first focuses on the effects of total government expenditures on economic progress, the second recognizes that different types of government expenditures may have different effects on economic growth.

Regarding the first stand of the literature, several studies investigate the relationship between government spending and economic growth using different empirical methodologies, and yet the results are inconclusive. Landau (1983) found that an increase in government expenditure's share in real GDP reduces the growth rate of per capita real GDP. Barro (1989) found a significant negative relationship between government consumption share and the growth of real per capita GDP and discerned insignificant positive effects of government investment. Josaphat et al. (2000) investigated the impact of government spending on economic growth in Tanzania using time series data over 1965–96 and found that increased productive expenditure (physical investment) has a negative effect on growth while consumption expenditure stimulates growth. Niloy et al. (2003) examined growth effects of government expenditure for a panel of thirty developing countries over 1970–80. They found that the share of government capital expenditure in GDP is positively and significantly correlated with economic growth, but current expenditure is insignificant. Other studies (such as Romer, 1990; Alexander, 1990; Folster and Henrekson, 1999) concluded that total government expenditures seem to have a negative effect on economic growth. Regarding the second strand of literature, which differentiates the impact of various categories of public expenditure, Landau (1983), using data for developing countries over 1960–80, examined the relationship between the growth rate of real per capita GDP and the share of government

expenditure in GDP. He found that government consumption expenditure has negative effects on the growth of per capita output, while the other types of government expenditure have little effect on output growth. Baum and Lin (1993) also examined the impact of three different types of government expenditures, i.e., defense, welfare, and education, on the growth rate of per capita GDP using cross-section data from developed and developing countries over 1975–85. They found that the growth rate of education and defense expenditures has positive effects on growth rate, while the growth of welfare expenditures has an insignificant negative effect on economic growth. Deverajan et al. (1993), using a sample of 14 OECD countries, found that government expenditure on health care, transportation, and communication has positive effects on economic growth, while expenditure on education and defense fail to produce such a positive impact. Albala, Bertrand, and Mamatzakis (2001) tested the impacts of infrastructure investment on long-run economic growth rates in South Africa and Chile and found positive growth impacts of "productive" government expenditure on infrastructure. In addition, the development and growth funds of the aforementioned categories should be properly managed in order to enhance economic growth and sustainable development, and they should be implemented while simultaneously improving the overall business climate in the country.

#### METHODOLOGY A. Theoretical Model

In order to empirically test the impact of government expenditure on the economic growth rate in Saudi Arabia, we will use a modified version of Ram's (1986) framework which is based on a two-sector production function; the private sector,  $P$  and the government sector,  $G$ . Output in the government sector depends on the inputs of labor,  $L$  and capital,  $K$ , while output in the private sector depends, in addition to those factors, depends on externality effects stemming from the size of the government sector.  $g_t$  is the growth rate of the real non-oil per capita GDP in period  $t$ ,  $I_p$  is real private domestic investment,  $I_g$  is real government investment,  $Y$  is real non-oil GDP,  $(Open)$  is openness to trade calculated as the sum of real exports and imports over real non-oil GDP,  $(Expi)$  represents various components of government expenditure in the subset  $\theta$ . Ghali (1997), using Vector Autoregression (VAR) and Granger causality analysis as well as annual data for 1960–96, found no evidence that government expenditure increased output growth, even after disaggregating the total expenditure into expenditures on consumption and investment. First, most empirical studies examining the relationship between domestic investment and economic growth suggest that the impacts of private investment differ significantly from those of government investment (Khan and Reinhart, 1990; De Gregorio, 1992; and Levine and Renelt, 1992; Khan and Kumar, 1997). We provide the cumulative IRFs only for the purpose of comparing them with the VECM results later.

#### 19 D. Long-term growth: VECM Results

To investigate the determinants of short- and long-run economic growth in Saudi Arabia simultaneously, we estimate a series of VECM specifications for the growth rate of the real non-oil GDP together with several sets of other variables.

#### Short-term Stability

Since our previous technique is imposing strict exogeneity constraints on the variables, next we turn to a VAR analysis which is relatively free from modeling restrictions. Although it is expected that long-run impact on growth will surface only after foreign educated talent returns to Saudi Arabia and is employed at full capacity; the short-run effects are already observed from VECM estimations. Post-estimation analysis Table 5 presents results for various post-estimation diagnostic tests.

#### V. EMPIRICAL RESULTS A. Stationarity and Cointegration

As a first step, we test the stationarity

of the variables by conducting the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests. This implies that one standard deviation shock to private domestic investment increases the non-oil GDP by 8 times more compared to a shock to education expenditures, instead of 17. To investigate the long-run effects in our models, we present the estimated normalized cointegration vectors in Table

4. Although the oil sector makes a significant contribution to overall GDP, it is largely affected by fluctuations in the world oil price and is a very misleading measure of growth for oil exporters such as Saudi Arabia. As explained in the methodology section, we estimate nine different versions of Equation (9) using various components of government expenditures in Saudi Arabia as explanatory variables. It is preferable that the government involve the private sector in these projects, since the contribution of private to the growth rate is higher, by allocating some subsidies from oil revenues to ensure the efficiency and accountability of operations. This will also help achieve fiscal sustainability over the medium- and long-term by diversifying non-oil revenue sources, and enhance efficiency of spending through the development of a medium-term expenditure framework. Intensive fiscal spending programs should be employed as an investment in future generations by allocating them to the productive sectors, especially during periods of global financial crises. Table 2 reports the results for cointegration tests implying that there is at least one cointegration equation at the 5.0 percent confidence level in each model. Following the Engel and Granger (1987) procedure, the results in panel A are obtained by testing the presence of unit roots in the residuals from the OLS on the long-run equation. Since in the presence of multiple independent variables there is a possibility of numerous cointegrating equations, we next employ the Johansen maximum eigenvalue test to identify the number of long-run relations among the model variables. Since we have annual data, the maximum number of lags that we can include in our model is limited, but using post-estimation tests we ensure that enough lags are included to avoid autocorrelation in the VECM residuals. As a robustness check (not presented here), we also estimate model 9 with three lags and have similar results for the short- and long-run relations. Housing, education, defense, health care, current and capital expenditures, and public investment, we analyze the relations between economic growth and total expenditures and private domestic investment. One of the policy lessons from these results is the need to facilitate private domestic investment, put more emphasis on the productive part of government spending in the form of public investment, increase public health care spending, alleviate barriers to trade to facilitate higher growth rate, and increase the efficiency in the housing market by improving access to housing finance. Nevertheless, as a robustness test, we will also utilize OLS and VAR methods to gauge the effect of government expenditures on economic growth in the short-run. To test for the order of integration of the variables, we use the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests. Private and government investments are expressed as a share of GDP for the long-run estimations, as dictated by our theoretical model, and we use the real growth of these variables for the short-run analysis, following the literature. We start by choosing the number of lags to be included in the estimations by analyzing various lag length selection criteria. This implies that model 1 has two cointegrating equations.

**B. Benchmark Analysis** As a benchmark, we start our analysis by estimating Equation (9) using a simple OLS regressions. Further, government expenditure on such infrastructure as roads and communications would

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