Potential Output, Total Factor Productivity and Institutions in the Private Sector of Saudi Arabia

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Abstract

This research on the private sector of the Kingdom of Saudi Arabia has two objectives. The first is to apply statistical and economic techniques to estimate the potential output and the output gap in the private sector of the economy. Once the gap is delineated, standard growth decomposition analysis is utilized to glean the respective contribution of factor accumulations and total factor productivity (TFP). The second is to utilize economic analysis and panel data using Poisson models to gauge differences in the educational attainments of foreign and domestic workers. The analysis links the findings to existing labor market institutional rules and regulations. Salient findings are that while the long-term (1974-2000) output gap was slightly positive, actual output fell short of the potential since the mid-1980s until the early 1990s. In the long haul, factor accumulations contributed the largest portion of growth in the private sector of Saudi Arabia. The findings hold when an endogenous growth accounting approach is applied. Growth of labor productivity dwindled and capital deepening was largely shrunk. However, there is some evidence of a revival in the TFP since 1993. Existing institutional structures have promoted the importation of successive waves of foreign workers that were of inferior education quality. This has led to marked contractions in growth contribution of foreign workers since the mid-1980s. The education system in the Kingdom is producing increasing numbers of educated Saudis who are partially making up for the reduced education embodied in foreign workers. Saudi graduates are relatively small in numbers and their composition across fields of study favors humanities, religious education at the expense of technology, computing and the hard sciences. More is needed in the way of quality education and R&D, which together with increased economic diversity and rising investment in machinery and equipment, are shown by a simple VAR model to be important determinants of TFP in the private sector of Saudi Arabia.

علاقة الناتج المحتمل بالإنتاجية الكلية للعوامل والمؤسسات في القطاع الخاص بالمملكة العربية السعودية

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عبدالوهاب أبو داهش

ملخص

تستخدم هذه الدراسة مجموعة من الأساليب الإحصائية والتحليل الاقتصادي من أجل تقدير حجم الناتج المحلي الإجمالي وفجوة الناتج في القطاع الخاص للمملكة العربية السعودية وتحديد مساهمة نمو عناصر الإنتاج ونمو الإنتاجية على النمو الاقتصادي للقطاع الخاص في المملكة ودراسة مستويات تعليم العمالة الوطنية والوافدة وعلاقة كل منها بالأنظمة والقواعد الإدارية السائدة في أسواق العمل. وقد بينت الدراسة أن فجوة الناتج بلغت قيما سالبة منذ منتصف الثمانينات من القرن الماضي. كما أن الإنتاجية الكلية سجلت معدلات نمو سالبة حتى مطلع التسعينات حينما أصبحت ذات قيم موجبة. كما تبين انخفاض إنتاجية عنصر العمل، ومعظمه من العمالة الوافدة، بمرور الوقت مع ملاحظة أن نمو رأس المال والعمل كان محركا أساسيا لنمو القطاع الخاص خلال عقد السبعينات وأوائل الثمانينات وذلك على حساب نمو الإنتاجية الكلية للعوامل. كما نتج عن تقدير دوال نموذج "بواسان" إثبات تدني مستويات تعليم الدفعات السنوية المتتالية للعمالة الوافدة. وتطرقت الدراسة أيضا إلى تحليل العلاقة بين معدلات نمو العمالة الوافدة ومستويات تعليمها ومستويات تعليم العمالة الوطنية وبين الأنظمة والقواعد المؤسسية التي بينت الأثر السلبي للمؤسسات على التوظيف والإنتاجية في القطاع الخاص.

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Introduction

This paper investigates the long-term relationship between economic performance of the private sector and labor market institutions in the oil-rich but labor-dependent economy of Saudi Arabia. The research is motivated by evidence suggesting that during the long-term, late-1960s to the end of the 1990s, factors of production grew steadily while output growth fettered and its potential declined (Auty and Mikesell, 1998).

Exploring linkages between institutions and the economy has gained prominence in recent economic literature (Topel, 1999). More specifically, recent economic literature has focused on the so-called hard determinants of growth, namely geography, trade and institutions. Factors of geography include natural climate, biology and geology that embody resource endowments and, more importantly, the adaptability of innovations and technology that are produced in temporal zones to tropical areas (Acemoglu *et al,* 2001). Trade and economic openness influence growth through competitiveness and labor productivity channels (Frankel and Roemer, 1999). Finally, institutions include the rule of law and protection of property rights under the premise that weak institutions lead to dictatorships and lack of any constraints preventing elites and politicians from plundering the economy (Rodrick *et al*., 2002).

It is postulated that existing institutional structures are prime drivers that have exacerbated the demand for uneducated, low quality foreign labor. Consequently, this has thwarted the demand for locals and in the process, adversely affected economic growth. Accordingly, the current paper attempts to test the hypothesis of an adverse impact on the Kingdom's aggregate economic growth caused by existing labor market institutions. The specific objectives of the paper are to:

- Apply statistical and economic techniques to estimate the output gap and the total factor productivity (TFP) and its determinants in the private sector of Saudi Arabia; and
- Examine the educational levels of imported and domestic workers and discuss the potential impact of labor market institutions on the size and quality of workers, and therefore, their potential growth effect.

The topicality of the paper is germane to the literature on the determinants of economic growth in resource-abundant economies. The literature indicates that resource abundant economies have tended to grow slower than economies with fewer resources (Auty, 2001). One line of causality suggests that natural resource abundance reduces private and public incentives to accumulate human capital due to a high level of non-wage income, e.g. dividends, social spending and low taxes. Lagging human capital can hinder economic growth as gleaned from a surge of articles that ascertain the existence of positive links between human capital and economic growth. In the study of Mankiew *et al* (1992) for example, output depends on a country's stock of human and physical capital. But it also depends on a country's level of TFP as suggested by Prescott (1998). The consensus is that in order to speed up economic growth, countries must enhance the education of the population and labor force (Romer, 1986 and Barro, 1997).

Stunted economic growth in economies with abundant resources is attributed to other factors as well. Some argue that an economy based on natural resources is more prone to shocks and the spillovers impact on the overall level of economic output. Under these conditions, resource abundance becomes a curse (Eifert *et al*., 2003). Others like Sachs and Warner (1995) argue that having abundant natural resources makes the country less competitive in manufacturing exports, and manufacturing exports have national spillover effects that make them "extra good" for growth. A third theme of the literature argues that natural resources undermine development through the "rentier effect" which occurs when governments use revenues from the exports of minerals to mollify dissent, avoid accountability pressures (because taxes are low), and repress opposition movements, independent business groups and civil society organizations (Gylfason, 2001). But as argued by Mehlum *et al* (2002), the mere presence of rent does not necessarily lead to the conclusion that there is a resource curse. Some countries have institutions that favor producers in the distribution of resource rents, while others have institutions that favor unproductive grabbers.

Data Sources And Methodology

The paper utilizes three types of data sets. The first is the National Accounts Statistics of Saudi Arabia covering the period 1967 to 2001. The second is the series on labor force and capital stock. The source of the data is the Ministry of the Planning, which recently published time series labor and capital stock data (Ministry of Planning, KSA, 2002 and 2003). Aggregate data on fiscal policy discipline, trade openness and investment composition are also utilized from the annual report of the Saudi Arabian Monetary Agency (SAMA, 2003). In combination, these data sources are applied to generate estimates of potential output and TFP and to unravel its determinants. The paper utilizes the population census of 1992 and various labor and employment surveys to glean estimates and profiles of the human capital characteristics of the labor force (Ministry of Planning, 1974, 1992; Central Department Of Statistics, Ministry of Planning, 1980 and 2000). Specifically, the population census collected information on the education and age attributes of workers. Since the majority of the workforce is foreign, the census asked questions about year of entry into Saudi Arabia. These data are utilized within the fixed-effect and conditional Poisson models to examine the direction and extent of changes in the quality of foreign labor over time and within age and sex cohorts.

Methodologically, the paper applies three types of approaches. The first is a statistical estimation of potential output based on the statistical techniques, the Hodrick-Prescott method, and on an economic approach, a standard Cobb-Douglass production function. Relative growth contributions of factor accumulations and TFP are derived. This is followed by an assessment of the determinants of TFP growth using a rudimentary VAR model. Finally, a combination of Poisson panel data models are deployed in order to determine the direction and extent of change in the education level of successive labor imports according to age and sex cohorts.

Saudi Arabia's Economic Growth Record

Largely due to its vast oil wealth, Saudi Arabia grew at fabulous rates during the past decades. Much of the fascinating and impressive growth occurred during the oil decade of the 1970s and early 1980s. However, the growth performance took a general downward trend since the mid-1980s. The downward trend is present both when the growth rate in the real Gross Domestic Product (GDP) is considered, as well as the growth rate in real per capita GDP, Figure 1. What is alarming about the evidence of Figure 1 is not so much the declining trend in the two growth rates depicted. Such a pattern is evident in a large number of developing and Arab countries. Instead, what is alarming about Saudi Arabia's evidence is the extent of the decline in the two growth rates in GDP. Between 1981 and 1986, the growth rates were negative with the exception of 1985 where the level of real GDP was positive. There was a slight recovery during the three-year period 1988-1991 but since then, real per capita GDP (RPCGDP) has been negative while that of total real GDP growth rate (RGDP) was mildly positive. It may be noted further that the growth rate of RPCGDP lies consistently below that of level of RGDP, carrying the further implication that the average real resources available per capita have been growing at an ever-slower rate. Certainly, the evidence points to a long-term structural decline growth rather than a sudden poor performance during the course of time.

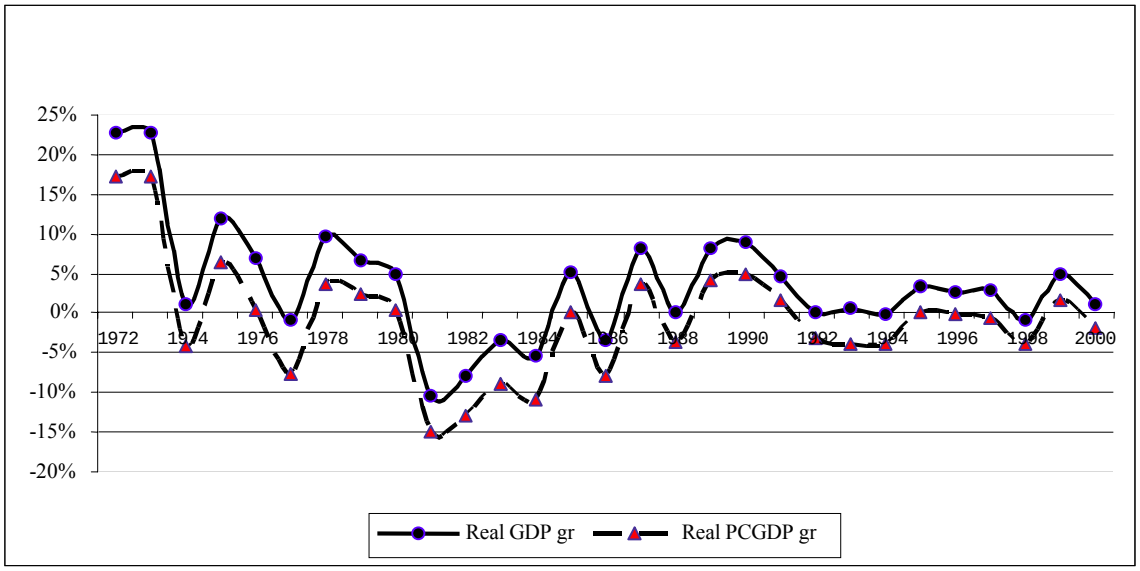

Figure 1. Growth rates of real GDP and real per capita GDP, 1972-2000.

The declining growth performance of the Saudi economy must be also viewed in context as it mirrors declining growth rates elsewhere in the world. Middle income countries as a whole, grew at 2.7% per annum on the average over the period 1980-1990, and at 3.9% per annum on the average, over the 1990-1998 period. In the case of Asia,

the acceleration was from 8.0 to 8.1% per annum over the same period. Thus, Saudi Arabia, which grew at less than 1% during 1980-1990 and at 2.6% during the period 1990-2001, has performed below the average maintained by its peer economies (Pritchett, 2001).

The scope of this study covers the private sector of the Saudi economy. Specifically, the focus of the study is on the role of factor accumulations and TFP as growth determinants and the underlying institutions-growth nexus. Studying the growth behavior of the private sector is important for several reasons. Firstly, it helps neutralize the effect of oil prices, which would be present if the focus were on the whole economy. Expectedly, the overall growth performance of Saudi Arabia would be tainted to a large extent, by the vagaries of the oil market. Secondly, most of the labor force and more than 90% of foreign workers cluster in the private sector of the economy. Thirdly, the private sector is likely to be sensitive to economic calculus and to the existing institutional rules and regulations. Finally, the relative size of the private sector has been increasing over time. Its share in total gross domestic product rose from about 25% in the 1970s to over 43% in 2000 (Ministry of Planning, 2003).

Private Sector Growth: Actual and Potential Output

This section applies a growth accounting framework that starts off by estimating the potential output in the Kingdom utilizing time series data extending over the period 1969 to 2000. The estimates determine the output gap, which is the difference between actual and potential output; that is: [(actual output-potential output/potential output)*100]. The literature offers a variety of methods that may be used to estimate potential output including the linear time trends, the Hodrick-Prescot filter trends, multivariate filter trends, unobservable components models and production function models. Virtually all methods lead to imprecise estimates that require considerable judgment (Orphanides and Norden, 2001. In view of such uncertainty, two techniques are implemented for estimating potential output: a univariate HP filter; and a Cobb-Douglas production function with constant returns to scale.

The Hodrick-Prescott (HP) filter is a statistical technique for determining the trend in real GDP. According to the HP approach, the historical long-term pattern depicted by its time series may be viewed as the sum of cyclical (short term) and growth components. The cyclical components arise because of short-term irregularities due for example to spells of unemployment and periods of random shocks to oil resources. In the context of the real GDP series, the HP filter derives a "trend" output such that it minimizes a weighted average of the gap between actual output, Y_t, and trend output, Y^*, and the rate of change in trend output, or its smoothness, over the whole sample period (Hodrick and Prescott, 1997):

$$\min \frac{1}{T}\sum_{t=1}^{T}(InY_t - InY_t^*)^2 + \frac{\lambda}{T}\sum_{t=2}^{T-1}\left((InY_{t+1}^* - InY_t^*\right) - (InY_t^* - InY_{t-1}^*))^2 \qquad (1)$$

where T is the number of observations, and λ is the factor that determines the smoothness of the trend. The larger the value of λ, the smoother is the solution series. A low value of λ will produce a trend that follows actual output more closely, whereas a high value of λ reduces sensitivity of the trend to short-term fluctuations in actual output and, in the limit, the trend tends to the mean growth rate for the whole estimation period. In line with recent literature, the value of λ selected for the annual series is 100 (Gounder and Morling, 2000).

A major disadvantage of the HP filter is that, since it is a two-sided symmetric filter, the estimated trend output series suffers from end-point biases. The method also fails to take account of structural breaks in the output series, instead smoothing out such changes. Another important drawback of potential output estimates based on the HP filter is that it does not have an economic basis, in the sense that the estimates are not based on available factors of production. In contrast, a production function approach explicitly models output in terms of factors of production and total factor productivity, following a fairly well known procedure. Moreover, a production function approach can be helpful in identifying sources of economic growth and isolate the effect of factor accumulation from quality improvements in factor inputs. The latter is typically captured by TFP analysis.

Easterly and Levine (2001) suggest that growth economists should focus on TFP and its determinants rather than factor accumulation. This is because most empirical studies reveal that factor accumulation explains only a portion of economic growth within and across countries. Moreover, time series data show that physical capital accumulation persists over time in most countries while per capita output growth does not persist. The endogenous growth theory initiated by Roemer (1986) and Lucas (1988) emphasizes the effects of variables such as trade, human capital, R&D and endogenous technology on economic growth. The role of human capital is especially critical in developing countries that must make the best use of imported technology and therefore labor quality and skills become crucial in enhancing and sustaining growth.

Accordingly, the parameters of a production function for the private sector using the standard variables capital and labor is estimated as:

$$Y_t = A_t K_t^{\alpha} L_t^{(1-\alpha)} \qquad (2)$$

where Y, K and L stand for output, physical capital and labor inputs and the parameters represents the shares of inputs while A is a measure of productivity. Following the literature on multiple types of factors of production (Barro, 1998), the estimation below also breaks down labor services into two types that correspond to national Saudi (Ls), and non-Saudi (Lns) workers in order to capture a basic property of the Saudi economy.

$$Y = F(A, K, Ls, Lns) \qquad (3)$$

One interpretation of Equation 3 is that Saudi and non-Saudi workers represent two different types of qualities of labor. Then the usual growth-accounting analysis goes through in the standard manner assuming that income shares weight each type of factor:

$$Y_t = A_t K_t^{\alpha} \; Lns^{(\beta)} Ls^{(1-\alpha-\beta)} \qquad (4)$$

In addition to unconstrained and constrained OLS estimation techniques, Equations 2 and 4 are estimated using Kalman Filter to compare estimates and guard against probable data deficiencies particularly in the series of Saudi and non-Saudi employment.[1] While differences in estimation results are generally small, all estimates reported below are those based on the Kalman Filter methodology.

Once, the coefficients are estimated, TFP growth is derived as the difference between observed real GDP growth and the weighted sum of Saudi - non-Saudi employment and capital growth. The weights are derived from the coefficients of the estimated production functions. The potential growth rates of TFP and employment are derived by assuming that TFP and employment were at their potential levels during two periods that are judged to have been cyclical peaks (i.e. 1977 and 1992) and their potential growth rates are equal to the trend (HP) growth rates between those two years. Finally, potential GDP growth is estimated as potential TFP growth plus the weighted sum of the growth in potential employment and the capital stock.

Figure 1 traces potential output and the output gap based on the statistical HP methodology while Table 1 provides estimates of the growth of potential output and of the output gap using statistical and economic techniques. Because of the vagaries of the period 1969 to 1973, estimates of potential output were restricted to the era of post-oil price increase of 1974.

Table 1. Estimates of Potential Output Growth and Gap (%).

Method/source	1974-2000	1974-1986	1987-1992	1993-2000
H-P filter	5.7	7.0	1.0	2.7
Production function	5.3	6.6	1.1	2.1
Output gap (HP)	0.7	2.8	-3.7	-0.4
Output gap (prod function)	0.8	1.7	-2.9	-0.3

Source: Estimated by the authors based on the production function and HP filter techniques.

As shown in Table 1, the size of the output gap was relatively small throughout the whole period 1974 to 2000, slightly under 1%. Yet during sub-periods, the gap as expected, oscillated between negative and positive values. In earlier periods, 1974 to 1986 for instance, the size of the gap was positive indicating that the economy was

[1] Kheir El Din and Abdelfattah applied the Kalman Filter to estimate jointly factor share and TFP for Egypt. See Kheir El Din and Abdelfattah, www.tedata.net.org

operating at full capacity. Potential output exceeded actual output since the mid-1980s suggesting resources were not optimally utilized. The slack diminished in most recent years but remained notable during the last period 1993-2000. It is to be noted that a positive gap for the whole period indicates that actual real GDP grew at higher rates than potential output. It may also be observed that the HP filter approach produces somewhat higher estimates of the potential output and its growth.

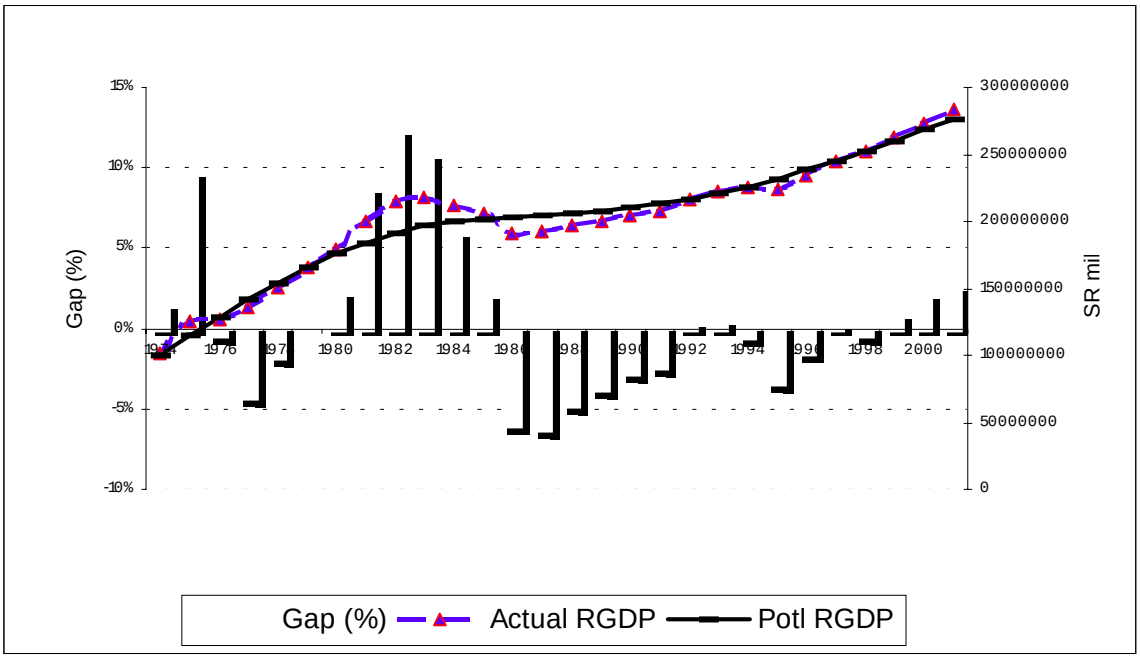

Figure 2. Actual *vs* potential output and gap, private sector of Saudi Arabia.

Growth Decomposition: Factor Inputs *Versus* TFP

The decomposition of the output growth using production Function 1 above is straightforward. Differentiating the function with respect to time and dividing through by output level, Y, yields the standard decomposition:

$$Gy = G_A + ey_{,K}G_K + ey_{,L}G \qquad (5)$$

where e stands for elasticity (factor share) and G stands for growth rates of A,Y, K and L.

Utilizing this approach, mean levels of TFP for the sub-periods 1969-1976, 1977-1985, 1986-1992 and 1993-2000 are presented in Table 2. What is somewhat striking is that throughout the whole period, TFP was a modest contributor to growth in the private sector of the Saudi economy.[2] Specifically, during the period 1969-1976, TFP was

[2] These findings are similar to findings for other countries of the Middle East. See for instance, Makdisi , Fattah, and Limam (2000). For the UAE, see Elhiraika and Hamed (2002) For growth-decomposition during the "golden" oil era, see Al-Qudsi (1980).

positive at 1.56, but subsequently grew at negative rates. During 1977-1985, TFP became -.33 and even more negative with -2.2 during 1986-1992. In the more recent period of 1993-2000, its growth rate rebounded and it started to contribute positively to the economic growth of the Saudi private sector. By contrast, the accumulation of factor inputs accounted for virtually all the growth during most of the period under study. Essentially, growth in the private sector was predominantly driven by factor accumulation. Specifically, the growth contribution of capital was particularly marked in the 1969-1976 but decelerated somewhat during 1977-1985 and continued to dwindle during the rest of the period. Non-Saudi labor inputs growth contribution amounted to 2.5% in 1969-1976 and 2.6% in 1977-1985 but declined to approximately 0.44 and 0.36 in the two subsequent periods. Finally, the contribution of Saudis was minute (.39) during 1969 to 1985 but picked up momentum reaching approximately 1.2 and 1.1% in the last two subsequent periods. Accordingly, growth decomposition analysis suggests that Saudi Arabia's private sector growth differs from that of other resource-rich countries such as South Africa, where growth was largely driven by improvements in TFP (Lewis, 2002).

Table 2. Contribution to Growth of Saudi Arabia's Private Sector

	1969-1976	1977-1985	1986-1992	1993-2000
Real GDP growth (%)	**17.73**	**5.61**	**0.95**	**3.0**
Contributions (in percentage points)				
Physical capital	**13.28**	**2.96**	**1.51**	**1.13**
Labor: Saudis	**0.39**	**0.39**	**1.20**	**1.1**
Labor: Non-Saudis	**2.50**	**2.59**	**0.44**	**0.36**
TFP	**1.56**	**-0.33**	**-2.22**	**0.41**

Source: Authors' decomposition based on the parameters of a production function that was estimated using Kalman Filter assuming constant returns to scale. The respective shares are: capital, 0.57; Saudi labor, 0.283; and non-Saudi labor, 0.147.

Labor Productivity Growth

An alternative way of examining the role of TFP in the growth profile is to view it from the perspective of growth rate of output per worker (the growth rate of output minus the growth rate of labor input as a function of the growth rate of capital per worker and of total factor productivity). Combining Saudi and non-Saudi labor in one factor input, total labor, and deploying discrete change, this expression decomposes the growth rate of labor productivity, ($\Delta Y/Y - \Delta L/L$) into two terms. That is:

$$(\Delta Y/Y - \Delta L/L) = \alpha\,(\Delta K/K - \Delta L/L) + \Delta A/A. \qquad (6)$$

The first term on the right hand side represents the contribution of capital deepening to increased labor productivity, while the second gives the contribution of TFP to the growth of labor productivity. Figure 3 illustrates the pattern over time.

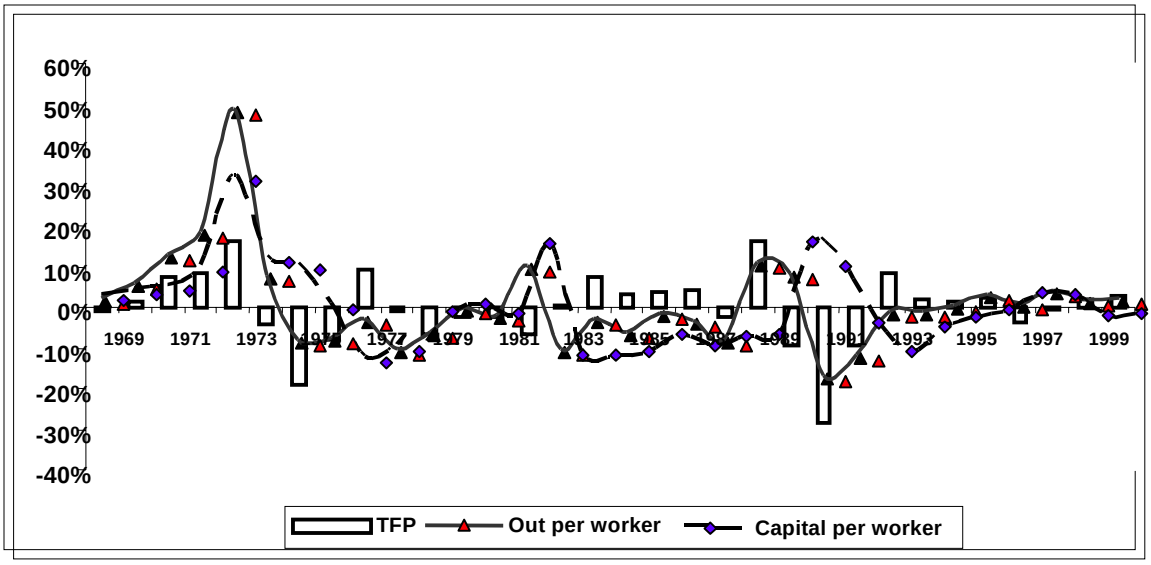

Figure 3. Growth rates of labor productivity, capital deepening and tech progress.

Labor productivity growth rates, displayed in Table 3, manifest the following trends. Firstly, its high rate of 10% during the early period of 1969-1976, was exclusively driven by capital deepening, which also grew by a healthy 9.4% annually. TFP growth was negligible at 0.7%. Secondly, during the periods 1977-1985, labor productivity grew annually at a negative average rate of 2.4%, accounted for by decreased capital-deepening (i.e. reduction in the growth of capital per worker) while some -0.30 was due to diminished contribution of TFP. Thirdly, while labor productivity growth continued to recede during the period 1986-1992, the decline was induced by a decline in TFP (-1.1%) while capital deepening grew at a modest rate of -0.45% per year. Finally, the more recent period of 1993-2000 witnessed an increase in the growth of TFP, but the increase proceeded at mild rates that were not capable of reversing the historically declining trend in labor productivity. In view of this finding, it may be worthwhile considering a future research issue. One area of future research is to test whether the sources of recent resurgence in productivity are basic improvements in labor quality and in management and organization of the sector or whether it merely is an outcome of the continued decline in the rate of capital accumulation

Table 3. Growth of Labor Productivity, Capital Deepening and TFP, Saudi Arabia's Private Sector.

	1969-1976	1977-1985	1986-1992	1993-2000
Labor productivity growth (%)	**10.1**	**-2.39**	**-1.55**	**-0.18**
Contributions (in percentage points)				
Capital deepening	**9.4**	**-2.1**	**-0.45**	**-0.58**
TFP	**0.7**	**-.29**	**-1.1**	**0.39**

Source: Based on estimates of a production function whose arguments are capital and a single labor input. Constrained estimation yielded the respective shares of capital (0.606) and labor (0.394).

The growth pattern of labor productivity is indicative of two symptoms. First, the protracted decline in the growth rate of capital triggered regression in the annual contribution of capital deepening to labor productivity growth. With the exception of the pattern during the early to mid-1970s, the growth contribution of TFP was fundamentally negative. Its intermittent and minutely positive growth rate, concomitant with high growth rates of labor, exacerbated the depressing effects on the growth of labor productivity. Finally, the trend suggests that the business sector of Saudi Arabia has followed a strategy of substituting labor for capital in the production of goods and services. The drawback of the strategy is in terms of its effect on the economy's capital deepening and on total factor productivity, given that the majority of imported foreign workers tended to be of the low-caliber in terms of education and skills as discussed below.

An Endogenous Growth Model

The analysis is now extended by applying a production function that falls within the framework of endogenous growth models. The function explicitly incorporates education as an input into the production process as specified by Hall and Jones, 1999:

$$Y_t = K_t^{\alpha} (A_t H_t)^{(1-\alpha)} \quad (7)$$

The human capital-augmented function takes the following form:

$$H_t = e_t^{\varnothing(E)} L_t \quad (8)$$

In this specification, the function $\varnothing(E)$ indicates the efficiency of a unit of labor with E years of schooling relative to one with no schooling. Values of the education variable were gleaned from the 1992 census, which allowed the construction of historical mean values up until the census year. The series up until 2000 was completed by extrapolating growth rates based on the actual educational levels reported by successive labor force surveys that were conducted in 1999 and 2000. The derivative of $\varnothing'(E)$ is the return to schooling estimated from applying the wage equation of Mincer (1974) to Saudi Arabia's wage data: an additional year of schooling raises a worker's efficiency proportionately by $\varnothing'(E)$. It may be noted that this specification emphasizes the role of

education as a potential determinant of total factor productivity. Other factors have been identified in the literature including R&D, the degree of competition and openness to trade, the efficiency of contract enforcement, the extent of corruption and the fairness and effectiveness of judicial and regulatory systems.

Herewith follows an empirical testing of a set of these factors in the context of Saudi Arabia. Table 4 summarizes the findings using the simple variant of the endogenous growth model.

Table 4. Growth Accounting Using a Simple Endogenous Growth Model, Saudi Arabia's Private Sector, 1970-2000.

	1969-1976	1977-1985	1986-1992	1993-2000
Real GDP growth (%)	**17.77**	**5.61**	**0.95**	**3.0**
Contributions (in percentage points)				
Physical capital	**16.2**	**3.60**	**1.68**	**1.4**
Education-augmented Saudi labor	**0.24**	**0.42**	**0.95**	**0.73**
Education-augmented Non-Saudi labor	**3.12**	**3.69**	**1.13**	**0.80**
TFP	**-1.79**	**-2.1**	**-2.81**	**0.07**

N.B. Authors' decomposition based on an econometrically estimated production function where parameters were constrained to sum up to one. Derived respective factor shares were capital, 0.692; Saudi human capital, 0.113; and non-Saudi human capital, 0.195.

The results of the endogenous growth model suggest the following. Firstly, when education is factored into the analysis, the declining trend in the growth contribution of non-Saudi workers becomes more discernible. This corroborates the main hypothesis that non-Saudi labor efficiency shrunk with the passage of time. Secondly, the contribution of Saudis was elevated with time, albeit at rates that only partially made up for the declining contribution of non-Saudi efficiency labor units. For instance, while the contribution of non-Saudis declined from 2.2% per year during the period 1969-1976 and 3.69% during 1977-1992, the corresponding Saudi contribution was 0.24 and 0.42% respectively. During the subsequent two periods, the respective growth contributions of Saudis were 0.95 and 0.73 while that of non-Saudis were 1.13 and 0.80%, respectively. Finally, the findings reinforce estimates about the role of physical capital and input accumulation in the growth pattern of the Saudi private sector − namely their initially high contribution during the early periods, and their diminished importance later on.

What Determines TFP? A Simple VAR Analysis

The time-varying growth-contributions of TFP beget the questions: What are the determinants of total factor productivity? R&D, human capital improvements, economic openness and better-quality institutions play a key role in increasing TFP, as highlighted

in the endogenous growth literature. For instance, in his pioneering contribution to the endogenous growth literature, Lucas (1988) emphasizes human capital as an alternative source of sustained growth. The literature also distinguishes between the stock and growth of human capital itself as sources of sustained economic growth. There is also an accumulation of evidence that investments in R&D produce long-term sustained economic growth and augment TFP (Aghion and Howitt, 1998). Trade openness may also contribute to TFP by allowing an economy greater access to imports of equipment and machinery, in which technological improvements are embodied, and to a wider range of intermediate inputs, as well as by subjecting domestic firms to more competition (Grossman and Helpman, 1991).

A simple vector autoregressive (VAR) model is applied to investigate the determinants of TFP in the context of Saudi Arabia's private sector. The dependant variable is the scalar of TFP that was derived above. The set of right-hand side variables include education levels of both domestic and foreign workers, diversity of the economic base measured as the ratio of private sector in total gross domestic product in the economy, the share of private sector in total investments and the share of machinery in total imports composition as well as the budgetary deficit, gauged as the ratio of government's budget surplus (or deficit) to gross domestic product. The variables gauging the education levels of Saudi and non-Saudi workers are estimated internally. The source of the rest of the data is Saudi Arabian Monetary Agency (SAMA, 2003).

Table 5 summarizes salient findings regarding the reciprocal lagged impact among the included set of variables and TFP.

Table 5. VAR model: Determinants of TFP in Saudi Arabia's Private Sector.

Equation	RMSE	R^2	χ^2
TFP	**.0364**	**.8607**	**135.9066**
Non-Saudi Education	**.0375**	**.8497**	**124.3783**
Saudi Education	**.0372**	**.8991**	**181.1154**
Economic Diversity	**.0290**	**.9632**	**575.4314**
Budget Discipline	**.0535**	**.8811**	**162.9754**
Share of private inv in total inv	**.0601**	**.9679**	**663.2415**
Share of machinery in total inv	**.0344**	**.8901**	**178.2565**
Variable/Lags	**Coefficient**	**Std Err**	**Z**
TFP			
TFP			
Lag 1	**-.3910**	**.1000**	**-3.91**
Lag 2	**-.2345**	**.0690**	**-3.40**
Non-Saudi Education			
Lag 1	**-.0559**	**.0203**	**-2.76**
Lag 2	**.0726**	**.0229**	**3.17**

Saudi Education			
Lag 1	**-2.0571**	**1.3657**	**-1.51**
Lag 2	**2.2241**	**1.4478**	**1.54**
Economic Diversity			
Lag 1	**.4919**	**.1978**	**2.49**
Lag 2	**-.6969**	**.1982**	**-3.52**
Budget Discipline			
Lag 1	**-.0646**	**.1349**	**-0.48**
Lag 2	**-.1838**	**.1378**	**-1.33**
Share of private inv in total inv			
Lag 1	**.2457**	**.1627**	**1.51**
Lag 2	**-.6634**	**.1439**	**-4.61**
Share of machinery in total inv			
Lag 1	**-1.0144**	**.2335**	**-4.34**
Lag 2	**1.0188**	**.2566**	**3.97**
Constant	**.0255**	**.2606**	**0.10**
Non-Saudi Education			
TFP			
Lag 1	**1.7839**	**1.0297**	**1.73**
Lag 2	**.4725**	**.7103**	**0.67**
Non-Saudi Education			
Lag 1	**.1872**	**.2085**	**0.90**
Lag 2	**.4412**	**.2360**	**1.87**
Saudi Education			
Lag 1	**-6.4933**	**14.0559**	**-0.46**
Lag 2	**7.2926**	**14.9009**	**0.49**
Economic Diversity			
Lag 1	**-3.0275**	**2.0362**	**-1.49**
Lag 2	**6.2859**	**2.0401**	**3.08**
Budget Discipline			
Lag 1	**1.0647**	**1.3893**	**0.77**
Lag 2	**-2.8036**	**1.4184**	**-1.98**
Share of private inv in total inv			
Lag 1	**-.8112**	**1.6747**	**-0.48**
Lag 2	**-1.7534**	**1.4806**	**-1.18**
Share of machinery in total inv			
Lag 1	**-1.0730**	**2.4032**	**-0.45**
Lag 2	**.4163**	**2.6409**	**0.16**
Constant	**1.2707**	**2.6824**	**0.47**
Saudi Education			
TFP			

Lag 1	**-.0847**	**.1023**	**-0.83**
Lag 2	**.0053**	**.0706**	**0.08**
Non-Saudi Education			
Lag 1	**.0453**	**.0207**	**2.19**
Lag 2	**.0541**	**.0235**	**2.31**
Saudi Education			
Lag 1	**3.0422**	**1.3969**	**2.18**
Lag 2	**-2.1674**	**1.4809**	**-1.46**
Economic Diversity			
Lag 1	**.5631**	**.2024**	**2.78**
Lag 2	**-.1776**	**.2028**	**-0.88**
Budget Discipline			
Lag 1	**-.2208**	**.1381**	**-1.60**
Lag 2	**-.0818**	**.1409**	**-0.58**
Share of private inv in total inv			
Lag 1	**.5586**	**.1664**	**3.36**
Lag 2	**-.2321**	**.1471**	**-1.58**
Share of machinery in total inv			
Lag 1	**-.7884**	**.2388**	**-3.30**
Lag 2	**.5179**	**.2625**	**1.97**
Constant	**-.6954**	**.2666**	**-2.61**
Economic Diversity			
TFP			
Lag 1	**-.0710**	**.0798**	**-0.89**
Lag 2	**.1020**	**.0550**	**1.85**
Non-Saudi Education			
Lag 1	**.0172**	**.0162**	**1.06**
Lag 2	**-.0024**	**.0183**	**-0.13**
Saudi Education			
Lag 1	**1.9919**	**1.0888**	**1.83**
Lag 2	**-2.1916**	**1.1543**	**-1.90**
Economic Diversity			
Lag 1	**.5197**	**.1577**	**3.29**
Lag 2	**.6246**	**.1580**	**3.95**
Budget Discipline			
Lag 1	**.1014**	**.1076**	**0.94**
Lag 2	**-.4230**	**.1099**	**-3.85**
Share of private inv in total inv			
Lag 1	**.1281**	**.1297**	**0.99**
Lag 2	**.5237**	**.1147**	**4.57**
Share of machinery in total inv			

Lag 1	**.2519**	**.1862**	**1.35**
Lag 2	**-.3849**	**.2046**	**-1.88**
Constant	**-.1990**	**.2078**	**-0.96**
Budget Discipline			
TFP			
Lag 1	**-.3718**	**.1471**	**-2.53**
Lag 2	**.3216**	**.1015**	**3.17**
Non-Saudi Education			
Lag 1	**.0101**	**.0298**	**0.34**
Lag 2	**.0909**	**.0337**	**2.70**
Saudi Education			
Lag 1	**1.9861**	**2.0087**	**0.99**
Lag 2	**-2.1259**	**2.1294**	**-1.00**
Economic Diversity			
Lag 1	**.4108**	**.2909**	**1.41**
Lag 2	**.7472**	**.2915**	**2.56**
Budget Discipline			
Lag 1	**.3944**	**.1985**	**1.99**
Lag 2	**-.8825**	**.2027**	**-4.35**
Share of private inv in total inv			
Lag 1	**-.0974**	**.2393**	**-0.41**
Lag 2	**-.0511**	**.2116**	**-0.24**
Share of machinery in total inv			
Lag 1	**.3267**	**.3434**	**0.95**
Lag 2	**.1401**	**.3774**	**0.37**
Constant	**-1.0326**	**.3833**	**-2.69**
Share of private inv in total inv			
TFP			
Lag 1	**-.1199**	**.1651**	**-0.73**
Lag 2	**-.0979**	**.1139**	**-0.86**
Non-Saudi Education			
Lag 1	**-.0376**	**.0334**	**-1.12**
Lag 2	**-.0191**	**.0378**	**-0.51**
Saudi Education			
Lag 1	**3.3145**	**2.2538**	**1.47**
Lag 2	**-3.3713**	**2.3893**	**-1.41**
Economic Diversity			
Lag 1	**-.5681**	**.3265**	**-1.74**
Lag 2	**-.1689**	**.3271**	**-0.52**
Budget Discipline			
Lag 1	**.1014**	**.2228**	**0.46**
Lag 2	**.2330**	**.2274**	**1.02**

Share of private inv in tot inv.	**.0515**	**.2685**	**0.19**
Lag 1	**.1166**	**.2374**	**0.49**
Lag 2			
Share of machinery in total inv			
Lag 1	**-.0546**	**.3853**	**-0.14**
Lag 2	**-.5985**	**.4235**	**-1.41**
Constant	**.7097**	**.4301**	**1.65**
Share of machinery in total inv			
TFP			
Lag 1	**-.1366**	**.0946**	**-1.44**
Lag 2	**.0944**	**.0653**	**1.45**
Non-Saudi Education			
Lag 1	**.0172**	**.0192**	**0.90**
Lag 2	**-.0403**	**.0217**	**-1.86**
Saudi Education			
Lag 1	**3.1055**	**1.2916**	**2.40**
Lag 2	**-3.2381**	**1.3692**	**-2.36**
Economic Diversity			
Lag 1	**.0936**	**.1871**	**0.50**
Lag 2	**-.3415**	**.1875**	**-1.82**
Budget Discipline			
Lag 1	**.0629**	**.1277**	**0.49**
Lag 2	**.2512**	**.1303**	**1.93**
Share of private inv in total inv			
Lag 1	**-.2614**	**.1539**	**-1.70**
Lag 2	**.1078**	**.1360**	**0.79**
Share of machinery in tot inv.	**.7120**	**.2208**	**3.22**
Lag 1	**-.2181**	**.2427**	**-0.90**
Lag 2			
Constant	**.2509**	**.2465**	**1.02**

The goodness of fit measures of individual regressions is adequate for all equations. The model's results suggest that both the education levels of Saudi and non-Saudi workers are powerful determinants of TFP in the private sector of the economy. The findings also reveal that the diversity of the economic base and the share of private sector investments in total investments influence TFP. Enhanced economic diversity implies an increase in the share of private non-oil GDP in the total gross domestic product of the economy. If private sector productivity increases at rates that are higher than those realized by the rest of the economy, this could bring about a rise in economic

diversity. The composition of investments also wields positive effect on TFP in the private sector. That is, a rise in the share of machinery and equipment in total investments is positively associated with TFP in the private sector of the Saudi economy.

The estimated parameters of this simple VAR model were subjected to several tests including the Granger vector auto regressive causality test, shown in Table 6. Clearly, the null hypothesis that the lagged levels of education of non-Saudi workers does not Granger cause lagged TFP is rejected in favor of the alternative hypothesis that lagged education levels do Granger cause lagged TFP as the critical values indicate significance at the 95% or better.

Table 6. Granger Causality Among Lagged Variables Of The VAR Model

Equation	Excluded	χ^2	Prob.>χ^2
TFP (TFP)	Non-Saudi Education	22.4037	0.0000
	Saudi Education	5.0449	0.0803
	Economic Diversity	12.7260	0.0017
	Budget Discipline	2.0610	0.3568
	Share of private inv in	21.6553	0.0000
	total inv	20.8158	0.0000
	Share of machinery in	122.1424	0.0000
	total inv.		
	All		
Non-Saudi Education	Non-Saudi Education	4.2933	0.1169
	Saudi Education	2.5276	0.2826
	Economic Diversity	9.5898	0.0083
	Budget Discipline	4.3807	0.1119
	Share of private inv in	2.6924	0.2602
	total inv	0.2384	0.8876
	Share of machinery in	45.1340	0.0000
	total inv		
	All		
Saudi Education	Non-Saudi Education	0.7041	0.7033
	Saudi Education	8.3222	0.0156
	Economic Diversity	8.4606	0.0145
	Budget Discipline	2.9739	0.2261
	Share of private inv in	11.2705	0.0036
	total inv	11.0258	0.0040
	Share of machinery in	24.9716	0.0150
	total inv		
	All		
Economic Diversity	Non-Saudi Education	3.6308	0.1628
	Saudi Education	1.2664	0.5309
	Economic Diversity	18.1144	0.0001
	Budget Discipline	15.4468	0.0004
	Share of private inv in	32.3696	0.0000

	total inv	**3.5525**	**0.1693**
	Share of machinery in tot inv.	**87.8037**	**0.0000**
	All		
Budget Discipline	**Non-Saudi Education**	**13.2387**	**0.0013**
	Saudi Education	**7.3311**	**0.0256**
	Economic Diversity	**1.2684**	**0.5304**
	Budget Discipline	**18.6144**	**0.0001**
	Share of private inv in total inv	**0.3906**	**0.8226**
		2.8168	**0.2445**
	Share of machinery in total inv	**49.0933**	**0.0000**
	All		
Share of private inv in total inv	**Non-Saudi Education**	**1.6861**	**0.4304**
	Saudi Education	**1.3352**	**0.5129**
	Economic Diversity	**12.9402**	**0.0015**
	Budget Discipline	**6.3398**	**0.0420**
	Share of private inv in total inv	**1.2962**	**0.5230**
		4.2370	**0.1202**
	Share of machinery in total inv	**36.3223**	**0.0003**
	All		
Share of machinery in total inv	**Non-Saudi Education**	**3.3370**	**0.1885**
	Saudi Education	**5.2156**	**0.0737**
	Economic Diversity	**10.4666**	**0.0053**
	Budget Discipline	**3.7319**	**0.1548**
	Share of private inv in total inv	**4.0399**	**0.1327**
		2.8872	**0.2361**
	Share of machinery in total inv	**45.9971**	**0.0000**
	All		

From the policy perspective, these preliminary findings suggest the importance of following more selective labor importation policies and point in particular to the desirability of recruiting workers with high education and skill levels. They also point to the importance of educating and training Saudis to fill high and productive career jobs in the private sector. Other probable education links pertain to the importance of R&D within private sector enterprises and to the prospective role of government in encouraging companies to adopt research-based decisions.

Labor Market Structure

The previous section examined the role of foreign workers in the private sector of the Saudi economy. Foreigners are important because of their sheer size, because of their rapid growth rates and more importantly, because of their potential contribution to

productivity growth in the economy. In this section and the next, two important dimensions of the foreign and domestic workers are analyzed. The first pertains to their education dynamics according to age and sex cohorts. The second deals with the issue of their respective sizes and labor impact via existing institutional structure.

Foreign workers have played an increasing role in Saudi Arabia, representing about 54% of the workforce in 2000 up from 24% in 1974. The increase occurred sequentially over time. During the twenty-year period 1965-1985, the size of foreign labor increased substantially from 163,000 in 1963 to 480,000 in 1975. It tripled in size to 1.7 million in 1980 and rose to 2.7 million in 1985. By the year 2000, the Saudi labor market was employing about 6.8 million workers. The majority were in the private sector, about 6 million. Of the 0.8 million workers that were employed in the public sector, 75% are Saudis. Moreover, 95% of all foreign workers (nearly 4.8 million workers) cluster in the private sector and the share of Saudis in private sector employment hovers around 20% (Ministry of Planning, 2001, 2002).

Clearly, growth rates of non-Saudi labor dominate the growth rates of Saudi labor virtually throughout the estimation and particularly during 1969 to 1992 as shown in Table 7. In the period 1974- 2000, the growth rate of foreign labor at 10.9 per annum was more than three-folds the corresponding growth of Saudis in the private sector. Moreover, the growth of non-Saudis was nearly double the growth rate of real gross domestic product of the private sector, 5.7%. Saudi labor force growth rate picked up momentum during the 1986 to 2000 period but in absolute size, the number of Saudis remains much smaller than non-Saudis.

Table 7. Basic Facts about the Growth of Output and Labor Inputs, Saudi Arabia's Private Sector, 1969-2000

	1974-2000	1969-1976	1977-1985	1986-1992	1993-2000
Real GDP growth	**5.7**	**17.73**	**5.6**	**1.14**	**3.0**
Saudi labor	**3.0**	**1.4**	**1.4**	**4.2**	**4.4**
Non-Saudi labor	**10.9**	**16.6**	**17.5**	**3.0**	**2.8**

Source: Computed by the authors from the Ministry of Planning and Economy, 2003. Achievements of Economic Plans and Central Department of Statistics: National Accounts of the Kingdom of Saudi Arabia 2003.

Quality of Foreign Labor

To explore the dynamic variations in the quality of foreign workers, two models are applied . The first is the fixed effect panel data model. The second is the conditional fixed-effect Poisson model. Conceptually, the models may be interpreted as demand by domestic agents for quality surrogated by the level of education embodied in foreign workers. The models are applied to the 1992 census data to determine changes in foreign labor quality according to age and sex cohorts over the period 1962-1992. The use of education (indicated as years of schooling) to gauge labor quality is premised on a

proliferating body of literature documenting the critical importance of education in economic growth. In fact, education requires human capital as an input as well as producing it as an output. This has significant implications, in as much as it may be difficult for an economy to increase its human capital quickly. It is quite possible for economies to get trapped into either vicious circles or vicious spirals. Economies with little human capital to start with, do not really have the ability to produce more and are stuck with a low human capital stock for a long time, whereas economies with high human capital stocks can easily produce more, and thus, can maintain a high growth rate (Aghion and Howitt, 1998).

In addition to demographic and education attributes, the 1992 census data collected information on the years of residence of foreign workers. This information is used to generate a new variable that identifies the year of arrival into Saudi Arabia, that is, by subtracting the number of years of residence from the benchmark enumeration year of 1992. A set of dummy variables is also created to correspond to sub-periods during which the difference between actual and potential output was marked. For instance, the dummy variable "yr62-75" refers to labor imports during the period 1962 to 1975 and the dummy variable for the period "yr1988-92" is the base category.

The model captures the time series-cross section nature of the data by mapping years of arrival into the Kingdom according to repeated age of labor cohorts, 25 to 29, 30 to 34, 55 to 59 etc. Algebraically, the fixed-effect model is:

$$Q_{it} = \alpha_o + X_{it}\beta + D_{it}\gamma + a_i + \varepsilon_{it} \quad i=1\ldots9,\ t=1962\text{-}1992. \tag{9}$$

where Qit connotes demand for quality gauged by embodied years of schooling of annual labor flows according to the ith age cohort, Xit contains the observed explanatory variable of cohort i in period t and Dit assigns workers according to one of the sub-periods based on the year of arrival into the country. A quadratic functional form is used that also contains years of residence in the Kingdom and its squared term and the gender of workers. The ai's are the fixed effects that may vary by cohort and reflect unobserved cohort-specific characteristics that may be correlated with Xit. The εit's are typical disturbance terms, assumed to be iid with a zero mean and a constant variance (Baltagi, 1995).

In the conditional fixed-effect Poisson, the dependent variable is the annual flows of foreign workers. Conceptually, the dependent variable may be thought of as representing demand for foreign labor according to embodied skill or educational level. The explanatory variables are workers' respective categories of educational attainment, sex, year of arrival and its squared term. The model takes the form (Cameron, Colin and Trivedi, 1998):

$$\Pr(Y_{it} = y_{it}) = \exp\{-\exp(\alpha_i + x_{it}\beta)\}\exp(\alpha_i + x_{it}\beta)^{yit}/y_{it}! \tag{10}$$

$$= \frac{1}{yit}\exp\{-\exp(\alpha_i)\exp(x_{it}\beta) + \alpha_i y_{it}\}\exp(x_{it}\beta)^{yit} \tag{11}$$

$$= F_{it}$$

where the dependent variable $Y_{it} = y_{it}$ is the flow of foreign workers, indexed by age groups, and x_i are the respective educational attainment of incoming flows. The log-likelihood function is:

$$L = \{\prod_{i=1}^{n} w_i \frac{(\Sigma_t\ y_{it})!}{\prod_{t=1}^{ni} y_{it}\ !} \prod_{t=1}^{ni} p_{it}^{y_{it}}\}$$

$$p_{it} = e^{x_{it}\beta} / \Sigma_{\ell} = e^{x_{i\ell}\beta} \qquad (12)$$

Categorical variables, which connote the educational attainment of incoming workers, are delineated according to the broad classification of education: illiterate, can read and write, elementary, intermediate, secondary, post-secondary diploma, university and higher education. The observations are repeated by the level of education of labor entrants according to year and number of age groups and the sample size is 5580.

Table 8 contains a summary of the regression results of the first model, the fixed effect model. The findings validate the hypothesis that foreign workers quality, surrogated by average years of schooling, has deteriorated over time. The variable gauging years of residence is positive while that connoting years of residence squared is significantly negative. The dummy variable capturing gender indicates that male workers experienced steeper quality deterioration. With the exception of persons working as maids in the domestic sector, most expatriate female workers tend to be well-educated and work as teachers, medical staff and social workers. Throughout the period, non-Saudi women's share has risen gradually but has remained under 15% of total foreign workers.

Table 8. Fixed-Effect Model: (Dependent Variable: Years of Education).

Variable	Coefficient	Standard Error
Years of residence	**0.2687*** **	**.0809**
Years of residence squared	**-.0275*** **	**.00669**
Male=1	**.4079*** **	**.02831**
Yr1962-75=1[(a)]	**.1795**	**.1282**
Yr1976-81=1	**.1935** **	**.08858**
Yr1982-85=1	**.1290** **	**.06106**
Constant	**1.245*** **	**.06661**
No. of observations	**5580**	
No. of groups	**10**	
R^2		
Within	**0.336**	
Between	**0.078**	
Overall	**0.207**	

*** Significant at 1%

**Significant at 5%

* Significant at 10%

[(a)] The benchmark period is year1986-92

The signs and magnitude of the coefficient of the "period dummy" variables indicate that labor flows that arrived in earlier periods had more education relative migrants of more recent years. For a panel data-type model, the fit is reasonably well as judged by the overall coefficient of determination and by the level of significance of individual coefficients.

Findings of the second mode, the fixed effect-conditional Poisson model, are summarized in Table 9. The model's dependent variable is "annual foreign labor flows". As expected, annual imports of foreign labor tapered off over time, and hence the variable gauging time (year of arrival) is negative and its squared term is positive. The sign of the gender variable implies that males were predominant majority in all labor flows. The findings corroborate that more recent waves of foreign workers had lower educational attainment. That is, with the passage of time, Saudi employers and agents intensified their demand for unskilled low-educated foreign workers.

Table 9. Fixed Effect Poisson model (Dependent Variable: Annual Foreign Labor Flows)

Variable	Coefficient	Standard Error
Read & write=1[(a)]	.1934***	.00163
Elementary ed=1	-.448***	.00193
Intermediate ed=1	-.447***	.00193
Secondary ed=1	-.255***	.00182
Post-secondary diploma=1	-1.064***	.00238
BA degree=1	-.6381***	.00204
MA degree=1	-2.968***	.00544
Ph.D degree=1	-3.996***	.00896
Years of arrival	-.2787***	.00228
Years of arrival squared	.00569***	.00091
Male=1	1.152***	.00124
No. of observations	5580	
Wald χ^2	5797646	
Log likelihood	-1213130.6	

*** Significant at 1%
**Significant at 5%
* Significant at 10%
[(a)] Illiterate workers= reference group

In terms of the main hypothesis, education categories are correctly signed and indicate that with time, less educated workers were flooding the labor market of Saudi Arabia. It is to be noted that the absolute values of the education categories are larger for higher levels of education. The signs are negative indicating that relative to the benchmark group of "illiterates", more recent arrivals had consistently lower educational skills.

Figure 4 shows the average education of workers in prime age groups, 20-49. Clearly, the trend is for the mean education to decrease over time and the decline is more perceptible since the late 1970s and early 1980s. In the late 1960s and early 1970s, average education hovered around 8 years for various age cohorts but declined to about 6 years in the early 1990s. After 1992, the education level embodied in foreign workers increased somewhat to about 7 years of schooling during 1999-2000. The long-term trend, 1970-1992, is disquieting as studies of sources of growth around the world establish that education plays a major role in the productivity of nations. For instance, based on international comparative data, recent literature has shown that each additional year of educational attainment of the labor force causes economic growth to increase by 10% (Cohen and Soto, 2001).

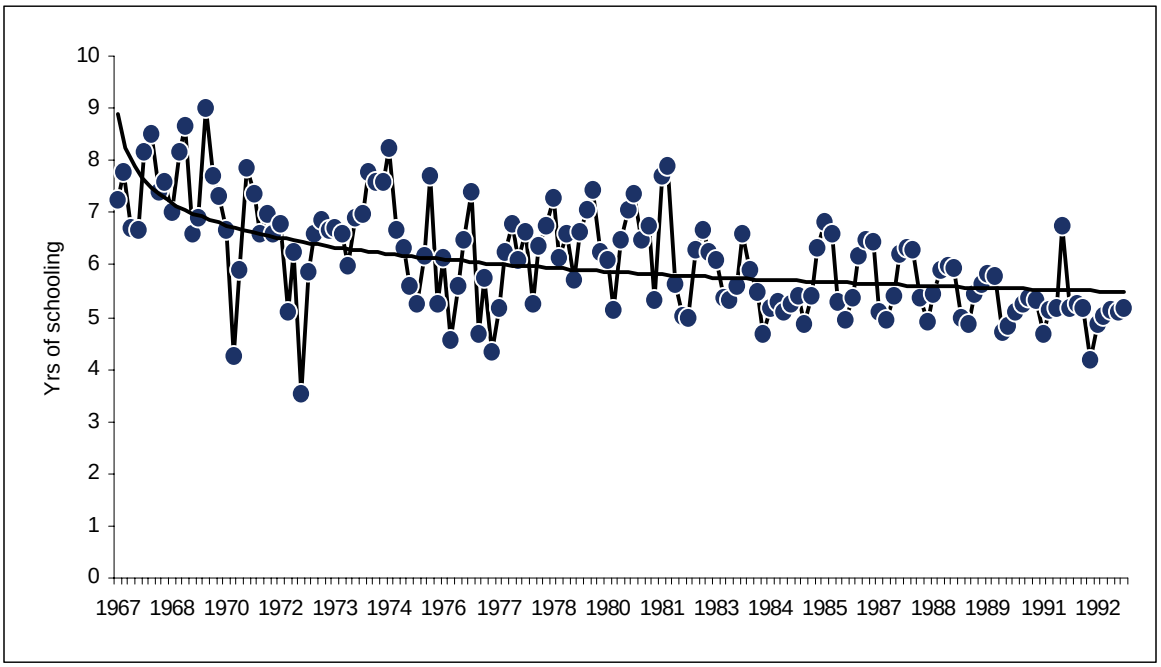

Figure 4. Mean-level of education of prime age foreign workers, 1962-1992.

Quality Of Indigenous Saudi Workers

A hallmark of the development process is the increasing utilization of different types of skilled labor in the production process. Thus, education policy and the composition of human capital can play a vital role in facilitating economic development. The emphasis is on the role of the composition of human capital in shaping the incentives for education investment among Saudis. The main argument is twofold. Firstly, the education system has failed to turn out sufficiently large numbers of annual graduates to achieve sustainable economic growth. Secondly, the composition of the education stock has not been conducive to shaping incentives for further investment of education and consequently, not conducive for achieving higher rates of economic growth.

On the average, the education system turned out 60,000 secondary graduates annually during the period 1975-2000, making for a cumulative total of about 1.5 million Saudi male and female students who completed secondary education, as shown in Table 10. An important reason for the small number of graduates is the high drop-out rates at various levels of education. For instance, the population census of 1974 reveals that the overall drop-out rate at the elementary level was greater than 55%. The second population census of 1992 reveals that the overall internal efficiency improved and the drop-out rate declined to nearly 15%. More recent estimates based on the demographic survey of 2000, reveal that the overall rate dropped further but has remained within the vicinity of 10%. Total enrollment in Saudi schools rose from 547,000 in 1970 to roughly 4.8 million in 2000. The number of students receiving intermediate and secondary education rose from 77,000 to 1.8 million, and the number of students receiving higher education rose from 7,000 to 387,000. About one-half of the graduates from secondary schools were female students and approximately sixty% of all secondary school graduates went on to complete their education in Saudi universities.

Table 10. Number of High School and University Graduates 1975-2000

Year	Secondary Edu Grads	Tech Schools	New University Entrants	University Grads	Educated Abroad
1975	7246	4325	4830	1909	200
1976	10739	3977	7159	2223	171
1977	14364	4119	9576	3210	186
1978	14324	5707	9549	3227	249
1979	15588	6267	10392	3252	335
1980	15558	6753	10372	3778	503
1981	19312	6293	12874	4740	639
1982	21064	5529	13671	5539	2120
1983	23631	6198	15404	6158	2334
1984	29559	4960	22013	6995	2645
1985	30493	17046	21809	6508	1667
1986	37117	6363	24018	7731	2128
1987	45445	8085	21684	9009	7165
1988	49253	4789	25721	11039	1142
1989	50223	9330	28712	12313	1106
1990	56762	9625	35513	12121	1097
1991	63497	10371	43007	12482	864
1992	67301	11093	37921	11756	540
1993	72425	11024	44700	15546	501
1994	86236	16628	49365	19693	646
1995	91880	16436	58851	26503	579
1996	91590	18966	57007	30748	734

1997	**112238**	**15946**	**73346**	**30263**	**915**
1998	**135281**	**8924**	**92780**	**31908**	**1100**
1999	**145008**	**12700**	**103775**	**41450**	**1500**
2000	**164629**	**14950**	**120666**	**39903**	**1031**
Cumulative	**1470763**	**246404**	**895885**	**360004**	**32097**

Sources: Ministry of Planning (CDS), 2002 **Statistical Yearbook of Saudi Arabia;**
Ministry of Higher Education , Statistics of Higher Education, various issues

The literature indicates that the limited supply of secondary educated labor reduces the productivity of tertiary educated workers and dampens the overall incentives for education investment. This is because the extra tertiary skilled labor may not sufficiently raise the returns to secondary education to create a self-sustaining investment cycle towards a higher steady state (Ramcharan, 2002). Therefore, Saudi Arabia's apparently small numbers of secondary educated graduates are likely to limit the economy to operate at a low steady state. It may be observed that the rest of secondary educated graduates, or 40%, elected for one of four alternatives: (a) joined the labor market; (b) in the case of some females, became housewives; (c) went to post-secondary technical schools including military colleges; or (d) traveled abroad to pursue their education.

Technical schools admit students who successfully finish high schools as well as those who complete the required level of intermediate education. Almost all graduates of the technical schools and all diploma holders join the rank and file of the labor market. In the period 1975-2000, Saudi universities turned out some 360,000 graduates. The majority of the graduates were in Islamic studies, 34.4%; 25% in arts and science, in education and business, 10% each. Students specializing in natural sciences and agriculture represented about 10% while engineers and medical specialists represented respectively less than 6% and 3.4%. The proportion of students who major in engineering is particularly low by international standards. There is no debate that the field of specialization is important since recent work covering 55 countries reveals that a positive correlation exists between the proportion of engineering majors and growth rates (World Bank, 1996). The cumulative number of Saudis studying abroad reached 32,097. Graduates abroad have a more balanced distribution across fields of study with 37% of foreign educated specialized in hard sciences, for instance.

The profile of high school and university graduates suggests the following. Firstly, the expected number of years of schooling, i.e. 8, remains low relative to levels in other countries ─ 12 in Jordan, 13 in Korea and 16 in the US (World Bank, 1998/99). The educational system suffers from high dropout rates already noted above. Furthermore, the system emphasizes the pedagogical approach and stresses rote memorization. As a result, this does not build students' abilities to think creatively and independently (Rough, 2002). These inefficiencies weaken productivity of the labor force and contribute to the high illiteracy rate, which was estimated in 2000, at 22% for Saudis 15 years of age or older (Ministry of Planning, Central Department Of Statistics, 2000). Secondly, despite impressive investments and growth, the system has lagged behind in terms of requisite number of graduates and relative to the dynamics of

education-intensive jobs created by the economy. For instance, during the period 1975 - 2000, the size of foreign labor increased from about 0.5 to 4.5 million workers. Nearly 600,000 of the existing stock of foreign labor are university educated. By contrast, the education system turned out some 360,000-university graduates, one-half of whom were females whose labor participation rate is very small. At the level of high school education, the system turned out more graduates but their size remained below the requirements of the labor market. Thirdly, the specialization of college-educated is skewed towards humanities and religious fields and away from productivity-enhancing fields such as technology and hard-core sciences. The pattern is reinforced by the tendency for graduates to seek secured employment in the public sector where "majors" do not matter much. As noted by Pritchett (1999), public sector employment has created incentives for higher educational attainment, but not necessarily for acquiring marketable skills.

Labor Market Institutions

Every country in the world has a complex system of laws and institutions intended to protect the interest of workers and to guarantee a minimum standard of living to the population. In most countries, this system encompasses three bodies of law: (a) employment law; (b) industrial and collective relations law; and (c) social security law. Employment laws govern the individual employment contract. Industrial and collective relations laws regulate the bargaining, adoption, and enforcement of collective agreements, the organization of trade unions, and the industrial action by workers and employers. Social security laws govern the social response to the needs and conditions that have a significant impact on the quality of life, such as age, disability, death, unemployment and maternity.

Three major theories of collective choice explain the working of institutions within countries, to wit: (a) The efficiency theory holds that institutions adjust to serve the needs of a given society most efficiently. Each society chooses a system of social control of business that optimally combines market forces, dispute resolution in court, government regulation and corrective taxes and subsidies. (b)) The political power theory on the other hand, asserts that institutions are shaped by those in power to benefit themselves at the expense of those out of power. Both voting and interest group policies allow the winners to benefit at the expense of the losers, with checks and balances on government limiting the extent of redistribution. (c) Under the legal theory, a country's approach to regulation is shaped by its legal tradition. Under this theory, the historical origins of a country's laws shape its regulation of labor and other markets (Botera *et al*., 2003).

To explicate the claim of a causal link between institutional structure and the derived pattern of fettered labor productivity and TFP growth, this section highlights existing labor market regulations and institutions. During the 1960s and early 1970s, Saudi Arabia foreign labor was predominantly made up of expatriates who worked in a broad spectrum of scientific and technical professions as teachers, doctors, accountants, information and computing specialists and so on. The majority held professional jobs as

doctors, teachers, engineers, accountants and clerks. The oil price increase of 1973 accelerated demand for foreign workers especially in construction, services, sales and engineering sectors.

The *Kafil* System. In order to involve nationals in the new projects that were being undertaken in various economic fields, authorities enacted the *Kafil* system in the mid-1970s. The *Kafil* is essentially a local citizen who obtains the entry visa and work permit for a foreign worker in return for payment. Concurrently, authorities barred non-nationals from entering into commercial ventures without a national partner and prevented foreign labor from seeking employment with other employers without the written consent of the *Kafil.*

However, instead of the appearance of a new stratum of local entrepreneurs, another group appeared in the labor market ─ "silent partner" ─ a citizen who plays a minor role in the economy by merely signing contracts and completing formalities. In return, these "silent partners" receive 51% of the revenues. These regulations contributed to dynamic multiplications in the number of low skilled workers from Asian countries such as India, Bangladesh, Pakistan, and Afghanistan in addition to workers from African countries such as Sudan, Eritrea and Somalia. For instance, while the number of foreign workers was 165,000 in 1963, it stood at 5.5 million in 2000, or at an annual growth rate of 10%. Accordingly, since the mid-1980s, the labor market has shifted towards Asian workers who now represent about 65% of all foreign workers while the share of Arabs receded from 70% in the late 1960s to 35% (Ministry of Planning Census, 1974, 1972; and Labor Force Surveys, 1999, 2000). A large segment of Asians are employed by the informal sector running small businesses as grocery stores, mechanics shops, gas stations, taxi drivers, tailors, gardeners or artisans of some sort. Typically, Asian workers stay for a short period of time, two to five years, and spend the first few months learning the language and culture. When they leave, new waves of Asian workers replace them and thus, the institutional structure leads to high turnover and labor rotation.

In addition to labor imports to satisfy business requirements in the private sector, the system allows every male or female Saudi to import up to four workers. Through connections and under-cover fees however, many Saudis managed to have hundreds of permits issued under their name or under the name of a relative such as a wife or a mother. The system also encourages the creation and registration of commercial and service establishments that do not physically exist and those that do exist, manage to have large labor import quotas issued under their names. Thus, the system of *Kafil* inadvertently, has conferred substantial power on importers of foreign labor and rent-generating activities arose when a segment of the local population finds the regulation a convenient opportunity for extracting rent from imported labor and a secondary market in work permits thrives. The system has resulted in two outcomes. Firstly, by chaining foreign labor to a "specific" *Kafil,* it greatly reduces labor mobility and constrains labor market flexibility. Secondly, the system gives ample incentive to *Kafils* to import foreign labor well beyond the "genuine" needs of the economy.

The impact of the system may be seen with the help of a simple diagram, Figure 5. The horizontal line represents the infinitely elastic supply of foreign labor. The initial supply of Saudis is represented by the curve Sso. In the absence of labor importation, the wage rate would be W_s, which is higher than the level that obtains when labor imports are allowed, W_e. In these conditions, the economy employs (O--S_{so}) Saudi workers and (S_{so}--S_n) Non-Saudi workers. As a result, some Saudis become unemployed, (S_{se}-S_{so}) in Figure 5.

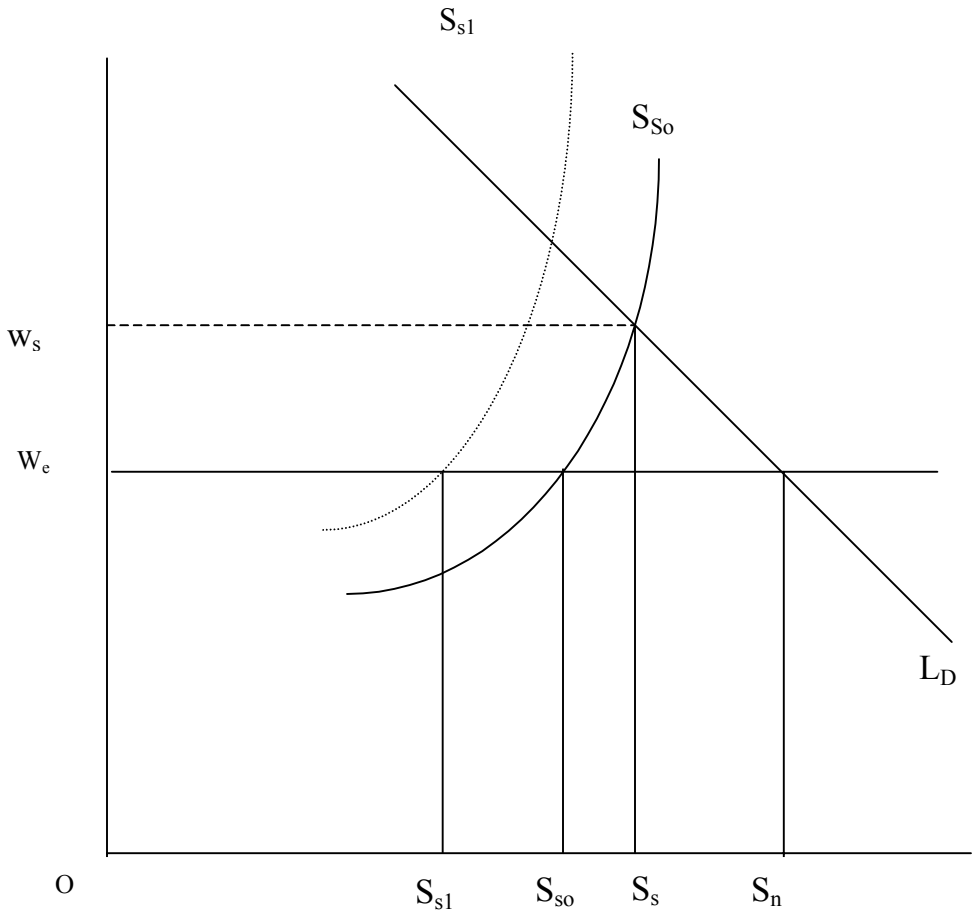

Figure 5. Demand for unskilled foreign workers and the unemployment of Saudi labor entrants

Conceptually, once in the ranks of the unemployed, Saudi job seekers may find it difficult to get re-employed. It is proposed that the effects are compounded when some Saudis take advantage of the existing *Kafil* system and subcontract their job slots to non-Saudis, in return for a pre-determined fee. In effect, this group of Saudis reduces their labor supply efforts, at least temporarily, that is, until labor market conditions improve.

The figure depicts such withdrawal by the leftward shift in the labor supply of Saudis. How realistic is this proposition? Utilizing panel data from two population censuses and several labor surveys, a rudimentary regression was estimated to assess the causal relationships between the dependent variable which is labor participation rates of Saudi cohorts and two explanatory variables: (a) the prevailing unemployment rate and; (b) the labor participation rates of non-Saudi workers.

The findings (not shown but are available from the authors) offer support to this argument. That is, *ceteris paribus*, the higher the unemployment rate, the lower is the participation rate of Saudi nationals. Secondly, there is also a negative and statistically significant association between the participation rates of non-Saudis and the rates of participation of Saudis: higher non-Saudi participation rates cause lower rates among Saudis. It is notable that the entire decline in Saudi participation rates occurs to young cohorts in the age groups of 18 to 29. This suggests that young Saudis get discouraged from the combined "negative externalities" of high unemployment and competing non-Saudis whose elastic supply drives wages to low levels similar to those depicted in Figure 5.

What is remarkable however is that rent-seeking activities triggered by the *Kafil* system causes temporal rightward shifts in the labor demand. Such shifts are independent of "rational" manpower needs of the economy and are triggered largely by the desire of unproductive grabbers to increase the size of their rent. Some of the unskilled and semi-skilled workers are imported despite the availability of domestic counterparts. The advantage of unskilled labor imports is their lower wages and the rent that could be extracted from them. To be sure, the increased importation of unskilled and low-quality labor, triggered by institutional forces, receives momentum from forces on the supply side. That is, in the entrenched welfare economy, rising aspirations of new Saudi labor entrants have begun to be reflected in dramatic changes in job preferences. New entrants are reluctant to engage in dead-end jobs (those perceived to not offer career advancement) or 3-D jobs (dirty, dangerous, and difficult). Examples of 3-D jobs are automobile repair, painting, welding, carpentry and plumbing. Accordingly, these jobs are left to the unskilled and semi-skilled foreign workers. It is not possible *a priori* to determine the relative strength of supply and demand forces, but to the extent that supply forces are active, they reinforce the strong demand for low-quality labor. Whether triggered by demand or supply conditions, the withdrawal causes workers to lose skills and training and thereby, lowers the probability of becoming re-employed.

That such regulations and institutions have survived for decades, attests to the influence of *Kafils* and sleeping partners that are engaged in the secondary market of work permits. Continued importation of unskilled foreign workers has dynamically pushed the unemployment rates among nationals from 5% in 1974 to 13% in 1992. According to successive labor surveys between 1999-2002 (Ministry of Planning, 2002), the overall unemployment rates have hovered around 8%. However, the incidence of unemployment is well over 20% among young Saudi cohorts.

To be sure, other institutional rules and regulations that prevail in the country, buttress the outcome of the *Kafil* system. Specifically, the country's licensing regulations and bureaucratic procedures and paperwork tend to slow down the development of micro-economic projects in the private sector. According to World Bank estimates (2003), the cost of complying with official requirements to set up new business is high, representing 153% of gross national income per capita, the most expensive in the Middle East after Yemen.

Conclusions

Utilizing a variety of estimation techniques, this paper attempted to establish causal links between the growth profile of Saudi Arabia's private sector and its institutional structure that led to excessive importation of cheap and low quality labor on the one hand, and to the slow evolution of Saudi graduates on the other. Applying the Hodrick-Prescott de-trending method and production function technique, the paper estimated the potential growth path of the economy and gauged the gap between actual and potential growth over the period 1974-2000. Relying on time series, census and labor survey data, the paper applied a combination of fixed effect panel data model, and a fixed effect Poisson model to test the hypothesis that newer labor entrants are less educated than foreign workers who arrived at earlier times.

Growth accounting implemented suggests that TFP played all but a minute role in the growth performance of Saudi Arabia's private sector. Factor accumulations were the main drivers of growth especially during much of the 1970s up until the early 1990s. The growth of non-Saudi labor was very high. Capital deepening was an important contributor to growth during the 1970s until the mid-1980s. However, its role has largely been diminished ever since. After growing robustly at 10% per year, labor productivity grew at negative rates throughout the two periods 1977-1985 and 1986-1992.

These findings hold when a simple endogenous growth model is applied along with standard growth decomposition analysis. Accordingly, the business sector of Saudi Arabia has been resorting to cheap foreign workers while keeping new investments at low levels, and in the process, causing marked deterioration in capital deepening and labor productivity growth. Beefing growth decomposition with institutional analysis makes it less puzzling to understand why Saudi Arabia with domestic labor shortages and high savings rates, would opt for labor-intensive modes of production through "excessive" imports of cheap and low-quality foreign workers.

This analysis suggests that this growth strategy has contrived the economy's growth potential and, in the process, has caused high unemployment incidence among the country's youth. However, evidence documented in this paper suggests that TFP has been gaining some significance as a growth contributor and labor productivity has started to spring back to an annual growth rate of at 0.41% per year. Estimates derived from the simple endogenous growth model, together with the rudimentary VAR estimates,

corroborate the significance of Saudi and non-Saudi education levels as determinants of TFP.

In view of the above, one area of future research is to test whether the sources of recent resurgence in productivity are basic improvements in labor quality and in management and organization of the sector or whether it merely is an outcome of the continued decline in the rate of capital accumulation.

Despite the impressive strides of the education system in producing an increasing stock of domestic human capital, Saudi graduates lag in quantity and quality relative to the requirements of modern economy. The education system needs to make a greater effort in preparing the labor force for enhanced growth in Saudi Arabia. One way to realize this is through adjusting the structure of current incentive systems and through re-orienting the economy's resources towards achieving greater efficiency and by focusing on the computing, technology and R&D and information needs of the modern economy. The findings of this study call for reforming labor market institutions and policies in a way that would foster skill acquisition and enable Saudi Arabia to harvest the benefits of better-educated foreign labor and maximize the returns on investments in domestic human capital and thus harvest the growth potential of the economy.

Bibliography

Acemoglu, D., S. Johnson and J. Robinson. 2001. Colonial origins of comparative development: an empirical investigation. *American Economic Review*, 91: 1369-1401.

Aghion, P. and P. Howitt. 1998. Endogenous Growth. Cambridge Massachusetts: The MIT Press.

Al-Qudsi, S.S. 1980. Growth and distribution in the Kuwaiti economy 1960-1975: A production function approach. *Journal of Social Science*, Vol. 8 (3): 250-264.

Auty, R. M. 2001. Resource Abundance and Economic Development. Oxford; Oxford University Press.

_____ and R. F. Mikesell. 1998. Sustainable Development in Mineral Economies. Oxford: Clarendon Press.

Baltagi, B. 1995. Econometric Analysis of Panel Data. London: Wiley Press.

Barro, R. J. 1997. The Determinants of Economic Growth. Cambridge, Massachusetts: MIT Press.

_____. 1998. Notes on Growth Accounting. Memo: Harvard University.

Botera, J., S. Djankov, R. La Porta, F. Lopez-de-Silanes and A. Shleifer. 2003. The regulation of labor. NBER Working Paper.

Cameron, A.C., and P.K. Trivedi. 1998. Regression Analysis of Count Data. Cambridge: Cambridge: Cambridge University Press.

Cohen, D. and M. Soto. 2001. Human Capital and Growth: Good Data, Good Results. Paris. OECD Development Centre.

Easterly, W. and R. Levine. 2001. It's not factor accumulation: Stylized facts and growth models. The World Bank Economic Review 15 (2): 177-219.

Economic Intelligence Unit. 1997 and 1999. : Country Report, Saudi Arabia, 2nd Quarter.

Eifert, B., A. Gelb and N. Tallroth. 2003. Managing oil wealth. Finance and Development, Vol. (40) No. 1: 40-44.

Elhiraika, A. and A. Hamed. 2002. Explaining Growth in an Oil-dependent Economy: The Case of the United Arab Emirates. Department of Economics UAE University, Unpublished memo.

Frankel, J. and D. Roemer. 1999. Does trade cause growth? *American Economic Review*, 89 (3): 379-399.

Gounder, K. and S. Morling. 2000. Measures of potential output in Fiji. Working paper 2000/6 Reserve Bank of Fiji.

Grossman, G. and E. Helpman. 1991. Innovation and Growth in the Global Economy. Cambridge, Massachusetts: MIT Press.

Gylfason, T. 2001. Lessons from the Dutch Disease: Causes, treatment, and cures. Institute of Economic Studies, Working Paper W01:06.

Hall, R. and C. Jones. 1999. Why do some countries produce so much more output per worker than others? Quarterly Journal of Economics, 114 (1): 83-116.

Hodrick, R. and E. C. Prescott. 1997. Postwar U.S. business cycles: An empirical investigation. Journal of Money, Credit and Banking, Vol. 29 (1): 1-25.

Kheir-El-Din and M. T. Abdelfattah. 2002. Sources of economic growth and technology progress in Egypt: An aggregate perspective. Memo: www.tedata.net.eg.

Lewis, J. 2002. Promoting growth and employment in South Africa. Africa Regional Working Paper Series No. 32.

Lucas, R.E. 1988. On the mechanics of economic development. Journal of *Monetary Economics*, 22: 3-42.

Makdisi, S., F. Fattah and I. Limam. 2000. Determinants of Growth in the MENA Countries. Arab Planning Institute, Unpublished Memo.

Mankiew, N.G., D. Roemer and D.N. Weil. 1992. A contribution to the empirics of economic growth. Quarterly Journal of Economics, 107 (2): 407-437.

Melhum, H., K. Moene and R. Torvik. 2002. Institutions and the resource curse. Department of Economics Working Papers, University of Oslo.

Mincer, J. 1974. Schooling, Experience, and Earnings. New York: Colombia University Press.

Ministry of Planning, Kingdom of Saudi Arabia. 1974 and 1992. Population Census of the Kingdom of Saudi Arabia.

_____. 2002. Achievements of Development Plans: Facts and Figures, Issue No 20.

Ministry of Planning, Central Department Of Statistics Kingdom of Saudi Arabia 1999 and 2000. Labor Force Surveys.

_____, Central Department Of Statistics. 1980 and 2000. Wages and Employment Surveys.

_____, _____. 2000. Demographic Survey. Riyadh.

Ministry of Planning, Central Department Of Statistics Kingdom of Saudi Arabia. 2002. National Accounts Statistics of Saudi Arabia

Orphanides, A. and S. Norden. 2001. The unreliability of output gap estimates in real time. CIRANO, Montreal.

Prescott, E. 1998. Needed: A theory of total factor productivity. *International Economic Review*, 39(3): 525-51.

Pritchett, L. 2001. Where did all the education go? *World Bank Economic Review*, 15 (3): 367-391.

Ramcharan, R. 2002. Columbia or high school? Understanding the roles of education in development. IMF Working Paper WP/02/36. IMF, Washington, D.C.

Rodrick, D., A. Subramanian and F. Trebbi. 2002. Intuitions rule: The primacy of institutions over geography and integrations in economic development. CID Working Paper No. 97.

Romer, P M. 1986. Increasing returns and long run growth. Journal of Political Economy, 94 (5): 1002-1037.

Rough, A. W. 2002. Education in Saudi Arabia: Choices and constraints. *Middle East Policy* , Vol. 6 (2): 40-53.

Sacks J. and A. Warner. 1995. Natural resource abundance and economic growth. Mimeo, HIID Cambridge, Massachusetts. Reprinted in: Leading Issues in Economic Development. Edited by Gerald Meir and James Rauch.. 2000. New York: Oxford University Press.

Saudi Arabian Monetary Agency. 2003. Thirty ninth Annual Report. Riyadh.

The Saudi American Bank. The Saudi Economy Mid-Year 2000 and 2002.

Ministry of Planning, Central Department Of Statistics Kingdom of Saudi Arabia Statistical Yearbook of Saudi Arabia, Issues 1995-2002.

Ministry of Higher Education, Kingdom of Saudi Arabia. Statistics of Higher Education: Annual reports for the Years 1995 through 2000. Riyadh.

Topel, R. 1999. Labor markets and economic growth. In: Handbook of Labor Economics. Edited by O.C. Ashenfelter and D. Card. Amsterdam: North Holland.

World Bank. 1996. Growing Faster, Finding Jobs: Choices for Morocco. Washington, D.C.

_____. 1998/99. World Development Report. Oxford University Press.
_____. 2003. Trade, Investment, and Development in the Middle East and North Africa: Engaging with the World. Washington. D.C.