



**Understanding Unemployment  
in the Arab Countries:  
Towards a Policy Framework**

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## **I. Introduction:<sup>1</sup>**

The goal of this paper is to analyze the unemployment behaviour in selected diversified Arab countries with available data, which will then form the basis of a useful policy debate. Needless to say the unemployment issue is amongst the pressing social and economic concerns anywhere and particularly so in the MENA region where its level has been historically high. Sen (1999) stresses the psychological and other harm (e.g., human capital depreciation, loss of motivation, family stress, racial tensions and gender asymmetries) over the direct income loss arising out of unemployment. Unlike industrial or higher income countries, typically there is little in the way of transfer programs.

While growth is looked upon as the key to ameliorating the unemployment and poverty outcomes, it is generally observed that even countries with a good growth performance have not been able to create a commensurately large number of jobs. However most discussion of the growth-employment nexus in the MENA context has been largely based on observed correlation pattern between variables, not via testing of formal hypotheses, and hence one cannot infer that there is no casual process at play here. Moreover, anyone familiar with the region would recognize that growth has been highly volatile, and hence in that context, it would be interesting to formally explore the likely impact of the sustainability of growth on unemployment.

The human capital literature points out that the former is at the core of the growth process, i.e., as an engine of growth typically embedded in labour-augmenting technology or via a similar device (e.g., Pissarides and Végonzonès-Varoudakis, 2006). If indeed output cannot grow beyond the subsistence level without the contribution of human capital, high growth must be synonymous with good human capital development. And the latter would translate to higher labour productivity and rising real wage in the economy. A cursory look at the observed growth experience in the MENA region does not conform to this premise, even though the recent pick up in the growth rate in most countries of the region is undeniable.

In order to examine the growth and employment nexus closely, one needs to look closely at the labour market developments. The region in focus has undergone a demographic makeover whereby the number of new entrants in the labour market over the past decade has been much higher than earlier decades, which is however expected to moderate in the years to come, but still remain high. Moreover, the participation level has remained modest by global, particularly developing country standards. In recent years, advances in female educational attainment have also spelt a new impetus to their participation. A final remark on the labour market feature of the MENA region needs to be highlighted which sets it apart from other developing regions, namely in its historical reliance on government or public sector jobs as a share of all jobs in the country. The latter phenomenon is believed to have distorted the labour market in manners such as by adhering to a non-market clearing wage structure, by providing wrong signals to the pattern of human capital acquisition, by fostering unproductive employment and thus lowering the growth potential for the given stock of human capital. Many writers argue that public sector can no longer afford to run its affairs as of the old; new job creation must come from the private sector thereby creating an environment for market incentives and efficient signalling.

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<sup>1</sup> The authors are, respectively, Professor and PhD student in the Department of Economics at Concordia University , Montreal. They are grateful to Ali Abdel Gadir Ali, Gordon Fisher, Nikolay Gospodinov and Rizwanul Isalm for constructive comments, suggestions and help with the data. The usual caveat applies.

Of course the paper cannot reasonably expect to address all these issues, regardless of how important they may be or how closely they may be connected. Instead the goal is to explain the recent behaviour of unemployment in a sample of five diversified economies in the Arab world most of which have a relatively large population, namely, Algeria, Egypt, Jordan, Morocco and Tunisia.

The focus is in specifying an adequate analytical model that may plausibly explain the functioning of the labour market such that it may be estimated with some degree of robustness before one can discuss policy. Hence the stress will be in developing an *a-priori* model of unemployment behaviour.

With the foregoing paragraphs serving as an introduction, the remainder of the paper proceeds as follows. In section 2, we lay out our methodological approach to the problem in the form of several hypotheses and propose a mutually consistent analytical structure. Here we also develop a 2-stage instrumental variable estimation strategy appropriate for the proposed unemployment model. Section 3 reviews the data situation and explains how it has been constructed. The descriptive properties of the 5-country dataset are then examined in some detail in section 4 situating it in the broader MENA as well as other developing area contexts. Section 5 reports the estimated results and provides an interpretation especially in light of what is available in the extant literature. The concluding remarks are put forward in section 6. Various tables and graphs are put together in an appendix at the end of the paper.

## II. The Methodology and its Empirical Formulation:

The analytical model proposed below builds on several stylized hypotheses, which have been variously supported by observed and/or anecdotal evidence in different contexts:

- (a) **Unemployment**, or its counterpart, employment growth when looked at from the demand side of the market must depend on the expected rate of expansion of the economy, namely GDP growth. However it is also understood that both employment and growth must be endogenously determined which in turn requires the ‘discovery’ of an instrument for the growth variable in order to empirically model employment behaviour.
- (b) **Human Capital**: Continuing with the sources of employment demand, in today’s knowledge economy, job creation/losses are often dictated by technological evolution. Consequently demand for appropriate skills would rise. It would thus be necessary to model unemployment in relation to a suitable ‘human capital’ variable. Here the challenge would be in identifying the best proxy measure of human capital. Further at the estimation stage, it would be necessary to investigate the role of an “instrument” since it is plausible that both *human capital acquisition* and employment/unemployment behaviour are jointly determined.
- (c) **Participation**: Next, one may observe that on the supply side of the market, *labour force participation*, especially by women, may play a major unfolding story. Indeed with greater education, participation, and hence labour supply would likely increase, but given the historical rigidities of the Arab labour market and capital market

deficiencies, unemployment may actually increase. It would be nice to capture these details in an estimated model. In any case, how should a researcher capture the participation variable in the analytic model?

- (d) **Capital Services:** Analytically speaking, the ease of acquisition of *capital stock* would feature prominently in any labour demand function due to the productivity link. In terms of the mechanism involved the issue boils down to the choice of technology and access to finance. Recent literature makes a lot of the significance of financial capital as an agent of economic growth, and hence, employment (e.g., see Aghion et al, 2005). Here again arises the mutuality of the growth and finance issue. In view of the endogeneity involved, one should ideally model growth as being dependent on some measure of the efficiency of the financial market, rather than merely as another independent variable.
- (e) **Globalization & Economic Integration:** In much of the modern growth and development literature, economic integration features prominently (e.g., Sachs and Warner, 1995). Hence we search for a measure of this variable as a possible explanator of employment generation. Empirically, however, a 2-stage estimation procedure as proposed here, would normally capture the effect of integration via growth itself, and thus the direct effect may or may not be discernible. Robust estimation would reveal if this is the case or not.

The analytical model implied by the foregoing discussion may be conceptualized as follows. Unemployment level ( $U$ ) may be defined as

$$(1) \quad U = LF - E,$$

where  $LF$  and  $E$  denote total labour force and employment, respectively in levels, or simply ‘labour supply’ less ‘labour demand’ suitably interpreted. Dividing through by  $LF$ , we obtain the ‘unemployment rate’ on the left-hand side of (1), which is convenient since most data is typically expressed in terms of the rate:

$$(2a) \quad (U/LF) = (1 - E/LF) = f(E/LF), f' < 0,$$

$$(2b) \quad \text{or, } UET = f(EMT/LPT)$$

where we use  $UET$  to denote the ‘total unemployment rate’. Expression (2b) follows from (2a) simply by dividing the numerator and the denominator on the right-hand side by the economically active population variable ( $P$ ), and thus we obtain  $UET$  as determined by the ratio of the ‘employment rate’ ( $EMT$ ) to the ‘participation rate’ ( $LPT$ ). For estimation purposes, however, one may linearize it, so that one may write

$$(3a) \quad UET = f_0 + f_1 EMT + f_2 LPT + \text{error}, \quad f_1 < 0, f_2 > 0.$$

Alternatively, we note that function (2a) is linear in log; hence we may also write:

$$(3b) \quad \log UET = g_0 - g_1 \log EMT + g_2 \log LPT + \text{error}, \quad g_1, g_2 > 0.$$

The sign pattern of the coefficients in (3a) and (3b) is of obvious significance.

One would normally hypothesize that the human capital variable (HUM) as well as health indicators such as longevity (LET) and mortality (MRT) rates would play important roles in determining the participation decision. Moreover, price of labour must also enter the function; here in the absence of data on real wage growth or on labour productivity, we use GDP growth (GRO) as a proxy. Thus we may write

$$(4a) \quad LPT = l(GRO, HUM, LET, MRT).$$

*Rising life expectancy* (LE) would have several implications for the labour force growth. It may delay the participation decision as individuals may accumulate human capital over a longer period in view of the expected longer working life, delay retirement (i.e., stay longer in the labour force), and for the 25+ group, the participation rate should normally go up at every age (presumably due to better health and better education). While the first element may temporarily help the employment outlook for those already in the labour force, in the longer horizon, the remaining two elements would *ceteris paribus* lead to an increase in labour supply. The net effect on labour supply and unemployment would thus likely be to raise them both.

*Under-5 mortality* (MRT) is another good health indicator which may also have significant implications on enrolment and eventual participation decisions. However the practical importance of this variable may be compromised due to its presumed correlation with the life expectancy variable.

The next task is to capture the demand side of the market, namely the evolution of the employment rate denoted by *EMT* above. Essentially here one needs to include factors that affect the marginal productivity of labour, and hence the labour input may be interpreted to have been measured in ‘*efficiency units*’. This variable must reflect, following the neoclassical production function idea, the roles of capital-labour ratio and the TFP growth parameter, where the latter may be thought to incorporate the impact of technological innovations. Additionally, on pragmatic grounds we include an integration variable, typically measured by export to GDP ratio (EXG), as several empirical studies have stressed its impact in job creation especially in East and South East Asia. Hence

$$(4b) \quad EMT = e(HUM, TFP, Access\ to\ Capital, EXG),$$

where we propose to use GDP growth as a proxy for TFP since no alternative estimate of the latter is feasible at this stage. Access to capital may be measured by the real interest rate (RIT), which is generally available. Thus we may restate the employment demand function as follows:

$$(4c) \quad EMT = e(HUM, GRO, RIT, EXG).$$

Thus in view of both supply and demand sides of the market, we may substitute (4a) and (4c) in (3a) and (3b) to obtain a reduced form equation that retains the essential structure of the causal relationships reviewed above:

$$(5a) \quad UET = \alpha_0 + \alpha_1 GRO + \alpha_2 HUM + \alpha_3 RIT + \alpha_4 EXG + \alpha_5 LET + \alpha_6 MRT + \varepsilon_1, \quad \alpha_1 ?, \alpha_2 ?, \alpha_3 > 0, \alpha_4 < 0, \alpha_5 > 0, \alpha_6 < 0.$$

Alternatively, in the log form, we have

$$(5b) \quad \log UET = \beta_0 + \beta_1 \log GRO + \beta_2 \log HUM + \beta_3 \log RIT + \beta_4 \log EXG + \beta_5 \log LET + \beta_6 \log MRT + \varepsilon_2, \quad \beta_1 ?, \beta_2 ?, \beta_3 > 0, \beta_4 < 0, \beta_5 > 0, \beta_6 < 0.$$

**Sustainability of Growth:** If one were to test the growth volatility hypothesis, it would be necessary to add a GRO-squared term or some suitable indicator of the degree of dispersion in observed growth rates across time and space on the right-hand side (rhs) of (5a) and (5b). The latter coefficient would be expected to be positive, namely higher volatility leads to higher unemployment according to the hypothesis postulated here.<sup>2</sup> It is intuitive that if growth is perceived to be unreliable, employers would hold off hiring till the outlook became more stable, especially when market rigidities make firing of workers difficult to accomplish. Given the sign pattern of (3a) and (3b) we expect the RIT and LET variables to raise the unemployment rate, while the opposite is the causality for EXG and MRT. Obviously in view of the conflict between the magnitude of the relative shift in supply and demand sides of the labour market, the overall effect of increased growth and human capital acquisition cannot be determined *a priori*.

**The Gender Issue:** An important element of this research would be to discern the implications for both male and female unemployment policies, and hence we would estimate equations (5a) and (5b) both in the general case (UET), as presented above, and lacking direct data on female unemployment, for males (denoted UEM). A comparison of the two sets of estimates would allow us to draw inferences along the gender dimension. Further details of the separate estimation of UET and UEM are described below.

**Proxy Variables:** When it comes to empirical modelling, the dependent variable (the unemployment rate), GDP growth, life expectancy and mortality are perhaps the only variables for which the choice is fairly clear-cut in the sense that the measurement issues are standard and well-known. Even then, and as noted already, we do not have data on female unemployment on a consistent basis for all countries in the sample analyzed here. (See below for more details of the sample properties.) On the rest of the variables, there is however a much larger latitude of debate, typically though the choice is constrained by the availability issue.

**Human Capital:** Although completed years of schooling among population in the 15-64 age group would be a natural variable to focus on (e.g., see Barro and Lee, 2000), this does not appear to be available for this panel. Hence we propose to measure ‘human capital’ by the *secondary school enrolment rate* (SET). For the male unemployment equation we likewise use boy’s enrolment figures (SEB).

**Access to Capital:** The real overnight rate under the control of the monetary authorities may be viewed as a good indicator of the cost of financial capital in most contexts since business prime lending rates are typically closely related to the former. However again due to non-availability, we choose the real interest (RIT) variable compiled by WDI which is a weighted average of real commercial lending rates.

**Instrumental Variable Approach:** Since several right-hand side variables (e.g., unemployment, GRO, human capital) may well be determined endogenously, it will be

<sup>2</sup> An example of a measure of relative dispersion in the observed growth behaviour would be a weighted term such as the country-specific standard deviation of growth ( $s_i$ ) divided by the actual GRO data ( $x_{it}$ ), i.e.,  $[s_i/x_{it}]$ ,  $i = 1, \dots, 5$ , and  $t = 1, \dots, 17$ .

important to take this into account. Hence we need to look for ‘instruments’ for GRO and human capital variables.

On the issue of a suitable instrument for GRO, Rodrik et al. (2002) have convincingly argued that the quality of *institutions* (à la New Institutional Economics, e.g., see North, 1990 and Williamson, 1984) is the primary determinant of long run growth.<sup>3</sup> Below we focus on the six indicators from the World Bank Governance project, namely “*governance effectiveness*” (GVE), which is a measure of economic governance (i.e., the capacity to implement policies and to deliver services) and “*rule of law*” (ROL), which measures institutional aspects of governance (i.e., respect of citizens and state for institutions) as alternative instruments for the growth variable. Presently, we use one component of these indices on which data is available on a consistent basis for all data points starting 1996, which is the entry point of these surveys.<sup>4</sup>

For secondary enrolment, the instrumental variable we propose is the ‘*percent of paved roads*’ (RDP) on which consistent data is available for all sample countries. The idea is that school enrolment would depend on the quality of physical accessibility of schools. The same variable would also indirectly capture the quality of transportation available in the local area since the latter is intimately related to the quality of roads, elements that are directly relevant to the access to education, especially for girls.

Thus we propose to estimate the following two first-stage equations for GRO and HUM:

$$(6) \quad GRO = \gamma_0 + \gamma_1 (GVE/ROL) + \gamma_2 RDP + \gamma_3 EXG + \gamma_4 RIT + \gamma_5 LET + \gamma_6 MRT + \varepsilon_3 ;$$

$$(7) \quad SET/SEB = \varphi_0 + \varphi_1 (GVE/ROL) + \varphi_2 RDP + \varphi_3 EXG + \varphi_4 RIT + \varphi_5 LET/LEM + \varphi_6 MRT + \varepsilon_4,$$

where we denote general ‘life expectancy among men’ by LEM as distinct from that in the general population, LET. The *a priori* sign-pattern of the estimated coefficients of these equations will be discussed when we describe the data.

The second stage estimation of (5a) and (5b) therefore takes the estimated values of GRO and SET/B respectively from equations (6) and (7) and similarly for the male unemployment equations. For testing the sustainability of growth hypothesis on the unemployment behaviour, one would add to the rhs of the second-stage equations fitted value of GRO either as a squared term or as measure of relative dispersion as discussed above.

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<sup>3</sup> This literature views institutions as encompassing the formal rules designed by polity as well as informal rules often labelled *social capital* that have emerged over the course of history. More broadly, the focus here is on those institutions that lower transaction costs and thus make a greater array of economic exchanges possible than would otherwise be the case under pure *laissez-faire*.

<sup>4</sup> The actual source is ‘global risk service’ introduced by Data Resources, Inc (DRI) in 1996.

### III. Data Construction:

We wanted to assemble a data set for the larger and more economically diversified countries from the MENA region, of course keeping in mind the structural differences in the nature of the challenges between those who are major exporters of oil and the rest. The data set should also be of a panel type so that we can analyze both changes over time and in the cross-section. These stipulations suggest that we may focus on the fairly recent period, here 1990-2006, which covers different oil price regimes as well as policy shifts in much of the region to address the problem of unemployment and under-employment. The availability issue forces us to narrow the dataset to 5 countries (Algeria Egypt, Jordan, Morocco and Tunisia). Below we shall often refer to the present sample as MENA\_5. Of the entire MENA region, the countries included in the present sample accounts for nearly half (46 percent to be precise) of the region's population, 45 percent of the *working-age* population and 43 percent of the labour force (ILO, 2005). Indeed the three relatively large countries included in this sample (namely, Egypt, Morocco and Tunisia) account for 41 percent of MENA's entire working-age population.<sup>5</sup>

Insofar as data on the primary variables are concerned, namely, unemployment rates (UET/UEM), annual GDP growth rate (GRO), secondary school enrolment rate (SET/SEB), export of goods and services as a share of GDP (EXG), life expectancy (LET/LEM) and mortality rate of children under 5 years' of age (MRT), the sample countries yield altogether 85 observations on each of these variables over 1990-2006 in the pooled dataset.<sup>6</sup> The details of the data construction are described in subsequent paragraphs.

**UET/UEM:** Data on unemployment rates are taken from the World Bank's *World Development Indicators* online database accessed through Concordia University's subscription (<http://ddp-ext.worldbank.org/ext/DDPQQ/member>). Some data points were missing in the former which were taken from the ILO website (<http://laborsta.ilo.org>), which are mutually consistent in most cases. Even then we face the problem of missing observations. In the results reported below, we followed an averaging procedure to fill these points.<sup>7</sup> For Jordan the unemployment data are exclusively drawn from WDI.<sup>8</sup>

**Governance Data:** As already stated, the data about institutional variables 'governance effectiveness' (GVE) and 'rule of law' (ROL) were processed by DRI, and which forms a component of the index that Kaufman et al (2007) has derived for these indicators. The DRI data is scaled on a percentile basis (from 0 to 100) so that these are easy to interpret, and are obtained from the World Bank website on governance (<http://www.worldbank.org/wbi/governance/govdata>). For the 1990-95 period, which pre-dates the survey in question, we use the 1996 values as proxy.

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<sup>5</sup> The figures are based on data included in the World Bank document on MENA's job creation prospects in a growth environment (WB, 2007), which does not include Turkey.

<sup>6</sup> The search for additional data however continues and any suggestions from readers on how to expand the dataset in a consistent basis would be highly appreciated.

<sup>7</sup> We took the average for dates (t-1) and (t+1) to choose the missing entry for date-t. In other cases (e.g., the last data point), we took the country average for the sample to obtain the missing observation(s). Clearly there are other methods for dealing with missing observations and we plan to deal with such issues on another occasion.

<sup>8</sup> More specifically, the pattern of the data source is as follows: Algeria and Morocco (both WDI and ILO), Egypt and Tunisia (ILO), and Jordan (WDI).

**Other Data:** The rest of the data (GRO, EXG, RIT, RDP, SET, SEB, LET and LEM) are all taken from the on-line WDI web site as cited above. As before where there are missing observations we followed the averaging procedure described earlier (footnote 5). For the real interest rate (RIT) variable, we took the year-by-year 4-country sample average to construct a series for Tunisia where no data was available from the sources noted above.

*De-trending of the Time Series Data:* For several variables, namely EXG, SET, SEB, LET and LEM, a discernible trend is noticed in the data. Hence we proceeded to de-trend the data as follows. For each observation for a given year, we took the average of the 5 country-data for that year, and subtracted the latter from each country's observation in that year. This procedure yields us normalized (i.e., zero-mean) observations for each year. It is the latter series that are used in the estimates to be reported below. RDP, the instrument for school enrolment appear to show no trend whatsoever for the present sample of countries, and therefore this is entered as is.

#### **IV. Descriptive Properties of the Dataset and the Related Literature:**

**Labour Market Developments:** The labour market dynamics in the region is rich in contrasts it presents vis-à-vis most other developing regions. For a start, female labour force participation has been historically low, and in spite of recent progress, at 31 percent as of 2005, it lags behind all other developing regions including South Asia. The total participation rates, though on the rise in some countries, have stagnated at moderately low level in global terms or even declined in others, indicating discouraged worker behaviour. Over the sample period, female participation has decreased in Egypt from 28 percent in 1990 to 22 percent in 2005, resulting in a decline in overall participation rate from 52 to 49 percent over the same period. Only Tunisia among MENA\_5 registers secular growth in both female as well as total participation rates. Moroccan figures have stabilized at the 2000-level. Algeria, on the other hand, has since 2000 adopted the practice of including 'work at home' and temporary public works jobs as 'employment', which have caused the participation rates to increase and, at the same time, unemployment level to fall significantly.<sup>9</sup> However this not a standard practice and adoption of such measures would render the sample strictly not comparable. The empirical analysis described below however is based on ILO-WDI estimates of UET and UEM.

Overall labour force growth in MENA has been the highest among all regions, and is likely to remain so at least till 2010, when sub-Saharan Africa (SSA) might take over the top spot in this regard. The female share of labour force for MENA as a whole stood at about 25 percent in 2000, but has been on an uptrend. However in Egypt and Morocco, the additions to the labour force over 2000-05 have been at their current rates, hence stagnation. Female share of labour force however have grown robustly both in Algeria and Tunisia since 2000.

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<sup>9</sup> The Algerian female participation rate rose from 24 percent in 1990 to 38 percent in 2005, some of which would be expected to be spurious due to reasons cited above.

Unemployment rate, the key object of focus in the present paper, has decreased in recent years for most MENA countries where comparable data exists.<sup>10</sup> While labour force growth has exceeded the growth of working-age population (by about a third) due to growing participation, the rate of additional job creation itself has also kept ahead of the growth of labour force (by a quarter), thus resulting in both falling unemployment and rising employment rates at the same time. While the regional unemployment rate reached 10.8 percent in 2005 (from 14.3 percent in 2000), in terms of the MENA\_5 sample used in this paper none had reached this level. In the case of Algeria, which officially shows to have reduced unemployment rate by nearly half (from 29.5 to 15.3 percent), the non-conventional procedures followed there leave such figures suspect. It is still plausible that the conventionally measured unemployment rate must also have fallen significantly in Algeria in recent years.<sup>11</sup>

Given the broadly positive backdrop of the unemployment situation, the rising female unemployment emerges as an issue of policy concern. With rising female participation in the labour force, job creation has generally failed to keep pace. Reviewing the data between 2000 and 2005, it is seen that in most cases, female unemployment had either increased or fallen by much less than the rate for males. In Egypt where female unemployment rate has fallen annually by about the same percentage as for males, the former remains 4 times higher than for men. In Tunisia there have been a sizeable decline in unemployment for men (from 15.3 to 13.1 percent); but in contrast the female rate has gone up from 15.9 to 17.2 percent. In Morocco, while both have fallen, the slow pace of reduction in the case of females has led to a rise in gender bias in relative unemployment rates in urban areas. Algeria appears to be a major exception where, for reasons already cited, female unemployment has come down faster than for men; however, both the rates still remain rather high even in a regional context (19.8 for males and 21.3 for females as of 2006, WB, 2007).

The pooled sample (1990-06) for MENA\_5 used in this paper presents a comparable picture (see Figures 1 and 2). Not unexpectedly, Egypt turns out as having the lowest average level of total unemployment over this period (at about 10 percent) and without much fluctuation. The Tunisian figures were fairly flat (at the 15 percent-level), while for Morocco some fluctuations are observed, ranging from 15.8 percent in 1990 to 9.7 percent in 2006. Jordanian figures have fluctuated between 27.5 percent in the early 90s to 12.4 percent in 2004. Algerian unemployment rates which stood at about 21 percent (both male and female) as of 1991 rose to 28.7 percent of the labour force as a whole (and 26.9 percent for males) by 1997, and hence much higher rates for females. Thereafter it has fallen gradually (to the 20-21 percent range by ILO-WB estimates), but national estimates suggest much lower rates, especially for females as noted already. Overall, the male figures as seen above were consistently and significantly below the total, implying a much higher rate for females, except as otherwise noted. The sample as a whole exhibited a high degree of volatility with the standard deviation being 5.5 and 6.4, respectively, for UET and UEM (while the mean were 16.4 and 15.1 percent).

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<sup>10</sup> The employment-unemployment figures reviewed below relate to the 2000-05 average for 12 countries highlighted in chapter 2 of World Bank (2007). These 12 include, in addition to the 5 in the present sample, Bahrain, Iran, Kuwait, Qatar, Saudi Arabia, UAE and West Bank & Gaza (WBG). Where appropriate, these means will be contrasted to those that obtain for the sample focused in this paper, i.e., the 5 countries over the period 1990-06, i.e., for a total of 85 observations.

<sup>11</sup> See Box 2, p44 in WB (2007).

**GDP growth:** GDP growth for the entire MENA region (excluding Iraq and Turkey) since the mid-1990s has been 4.63 percent, which is somewhat below that for developing countries as a whole but is significantly higher than that experienced either by Latin America and the Caribbean (LAC) or sub-Saharan Africa (SSA). Only Jordan and Tunisia have grown a little faster pace (5.3 and 4.9 percent, respectively). The average rate over 1990-2006 has been 4.1 percent for the sample analyzed here, which is below the MENA average cited above. Moreover, in most cases, growth has been uneven with significant year-to-year fluctuations, the standard deviation being 3.3 that is much more than that either in South Asia or 'developing countries' as a whole. In any case, unlike for example South Asia, there is not a strong evidence of rising trend in GDP growth over the past 5 years (see Figure 3).

To examine the sample more closely, Algeria's real growth started from 1 percent in 1990 rising to 3 percent in 2006 with fluctuations in between, and with *negative* rates (in the 1-2 percent range) in the early 1990s. Egypt has grown much faster starting off with a figure of 6 percent in 1990 and registering 6.9 percent in 2006 but growth had faltered during 2000-5, where the 6-year average was mere 4.0 percent annually. Jordan's growth was highly volatile in the early 90s (though never in the negative territory), but has since stabilized. The average growth since 2000 is well above the regional average. Morocco's figures were low to begin with (in the 4.0 percent range in 1990), but it shot up to 7.3 percent in 2006. However, growth had been frequently negative in the 1990s (e.g., negative 6.6 and 2.2 percent, respectively, in 1995 and 1997). GDP growth in Tunisia started from 8 percent in 1990 and fell to 5.2 percent in 2006, again with a fair bit of fluctuations. The frequent observation in the literature that growth has been unable to engender jobs creation (e.g., Messkoub, 2006) may well be due to its periodic fluctuations, a hypothesis that is formally tested below.

**The institutional variables (GVE/ROL):** Most sample countries fall roughly in the middle of the MENA distribution for both these indicators, where the overall MENA record has improved over time. While the MENA average of these variables are slightly below the global mean, the present sample of 5 countries produce results that are in the second quartile of the global distribution (see Figures 5 and 6). Jordan and Tunisia do rather well in both categories (i.e., GVE/ROL) while Morocco performs the best in terms of the 'rule of law' throughout the sample period. Studies using such indicators appear to support the hypothesis that the long-run growth potential of a country does depend on the underlying quality of governance (Kaufman, 2006).

**Human Capital:** The MENA educational standards have improved significantly in the last 20 years or so (see Figures 7 and 8 for a regional comparison). Barro and Lee (2000) analyze quinquennial data on average schooling years, which is also seen to have about doubled since 1980 thus closing the gap with regions such as East Asia. Gross secondary school enrolment rate, the 'human capital' variable for the present study, indicates that Egypt and Jordan enjoyed the highest level of this indicator throughout the time period. It rose from about 70-75 percent in the early 1990s to mid-80s by 2006, both for boys and girls. The gender disparity is totally absent in the case of Jordan, but still lingers in the Egyptian case. Algeria started from a lower base of 61 percent in 1990 and rose to 83 percent in 2006, a sharper pattern, while Tunisia started from an even lower figure of 45 percent in 1990 to reach 79 percent in 2000, which records the fastest pace in the sample. Morocco, by contrast remains out of league where the figure started from 35 percent in 1990 to reach only 50 percent in 2005. For *boys* the educational level is higher than the aggregate figure, but the levels are significantly below that for the remaining countries in the sample by a wide margin.

We had noted earlier that rising educational attainment, especially by women, has been an impetus to their labour force participation, contributing to the secular rise in the labour force. While rising unemployment among the more educated, especially females, has been observed in MENA countries (more on this below), for Egypt on which adequate data exists, it is seen that at the secondary education level, female unemployment rate fell from 47.7 percent in 2000 to 33.8 percent in 2006. However at the higher education level, the opposite pattern indeed is in evidence (20.2 vs. 24.8 percent, respectively between 2000 and 2006). The underlying efficiency of the labour market institutions determine to what extent the right type of human capital is produced, how effectively it is deployed and rewarded. Thus it would be important to carefully interpret the empirical results in this regard.

**Export Ratio (EXG):** Oil exports endow the MENA region with a large export-to-GDP ratio (see Figure 4). What is remarkable is that even the oil importing nations within it export in excess of one-third of their GDP as of 2006, with a good proportion destined for EU (especially for Egypt, Jordan, Morocco and Tunisia). The export share has been far in excess of that in South Asia (in low teens) or for that matter the LAC region (about 28 percent). Given this background, the sample countries examined here on average enjoy higher exports to GDP ratio vis-à-vis the average for MENA oil importers cited above as well as that for ‘all developing countries’. The annual pattern, as elsewhere in MENA, has been on an uptrend though exhibiting some fluctuations. Jordan is the leader in this category where the ratio had fluctuated between 62 percent in 1990 to figures in the 40-percent range in late 1990s before stabilizing at the 50-percent level in recent years. Egypt’s figures range from 20 percent in 1990, falling to 15 percent in 1999 but then it reached 31 percent in 2006, while Morocco’s level has been very stable, ranging from 27 percent (1990) to 37 percent (2006). Tunisia is the other major exporter among the ‘resource-poor group’; its ratio stood at 43 percent in 1990 and rose to 55 percent in 2006 with minimal fluctuations along the path. These figures were ahead of resource-rich Algeria throughout the sample period, except that the latter, buoyed by high oil prices, jumped ahead with an export ratio of 56 percent in 2006. It would be of interest to examine if the export ratio affects unemployment via growth or independently.

**Life expectancy (LET):** mean over the entire pooled sample being 69, is also high for developing countries, and it has been rising for all sample countries with Tunisia being at the top at 73 (2005), and within-sample variability has been minimal in recent years. It has been observed earlier that rising life expectancy is likely to lead to an increase in unemployment in the longer run via participation and a longer working life thus lowering the vacancy rate, other things being equal. See Figures 9 and 10 for a regional comparison of life expectancy both general (LET) as well as that for males (LEM), respectively.

**Mortality Rate (MRT):** Most countries in the region have relatively low mortality rates vis-à-vis other developing regions, though for this indicator there is quite a bit of dispersion in the data. The Algerian figures generally lie between 5 and 6 percent except for the blip to 18 percent in 1997. Egypt’s mortality rates declined significantly from 13 percent in 1990 to 4 percent in 2003 except recording 18 percent in 1995. Morocco also shows good progress on this front where it dropped from 8 percent in 1990 to 5 percent in 2002 and kept on dropping, while Jordan and Tunisia stay at the top of the heap with low and stable figures rather close to the OECD level.

**RDP:** The availability of paved road is relatively high in the sample region vis-à-vis the average picture of the middle income as well as South Asian countries (see Figure 11). Jordan

is right on top with 100 percent of its roads duly paved thus meeting or even exceeding the standard in high income OECD countries. Morocco at the other extreme has roughly 57 percent of its roads paved by 2005, while Algeria, Egypt and Tunisia stay in high sixties. The latter's record in this category appears to have slipped a bit in the last decade vis-à-vis the previous one when the ratio had reached the high 70s mark.

## V. Empirical Results:

The empirical estimation is done first for the overall sample, where the independent variable is 'general unemployment rate, UET', and then for 'male unemployment, UEM'. All right-hand side variables are identical between the two estimations, except where gender specific variables are involved (e.g., enrolment and health indicators). Another preliminary point to settle at this stage is that since several right-hand side (rhs) variables are negative in the sample either in their own rights (e.g., RIT) or due to normalization (e.g., EXG, SET/SEB, LET/LEM), we are not able to estimate a full logarithmic version of the basic model (e.g., equation 5b and similar ones for UEM). Instead we estimate these in the semi-logarithmic form, i.e., where the left-hand side (lhs) variables are entered as logarithms.

### 5.1 The Correlation Matrix:

Before discussing the regression results, let us focus a little more on the data and some preliminary diagnostics. An initial examination of the correlation pattern among variables revealed that under-5 mortality (MRT) was fairly closely and negatively correlated with LET/LEM in this sample (the Pearson coefficient being in excess of - 0.5). Consequently the separate roles of LET/LEM and MRT may not be identifiable in the estimated models as some preliminary tests appeared to confirm, and hence we dropped MTR from any further consideration in order to avoid a potential source of multicollinearity.

The correlation chart (see Table 1, appendix) indicates that growth (GRO) and human capital (SET/SEB) each appear to be negatively correlated with unemployment both generally and among men, which is intuitive. Increased life expectancy on the other hand seems to be associated with higher unemployment (both UET and UEM), which is also in accordance with the sign pattern predicted by the analytical considerations reviewed in section 2 above. The EXG variable appears to correlate positively with unemployment, which is counter intuitive at least from the Asian perspective where growth has been heavily influenced by export success. Similarly, i.e., contrary to intuition, the real interest rate (RIT) variable appears to negatively correlate with unemployment. In terms of the risk of high correlation among the independent variables, it is seen that EXG and LET/LEM are also well correlated (coefficient being 0.58 and 0.64 for LET and LEM, respectively). It would be necessary to examine if this is a cause for concern on account of potential multi-collinearity.

**Validity of Instruments:** Insofar as the instrumental variables are concerned, both GVE and ROL are positively correlated with GRO, though the coefficients are moderate in magnitude (0.28 and 0.22, respectively). The RDP variable, an instrument for the enrolment equations, appears well correlated with SET/SEB (coefficients being 0.74 and 0.70, respectively). Running simple OLS regressions, it is further confirmed that while GVE is significant in explaining GDP growth at the one-percent level, ROL attains significance at the 5-percent level. The RDP variable by contrast is highly significant in explaining the enrolment pattern both generally and for boys (with the p-value being 0.00 in each case). Hence the preliminary

diagnostics for the validity of the instruments pass muster for the set of instruments chosen presently.

**OLS Results:** Before going into the two-stage estimation procedure discussed above, let us briefly outline the simple OLS results first so as to put the results that follow in a proper perspective. Table 2 report the OLS estimates where the unemployment variable have been treated in the logarithmic form, which yields a better fit than the linear specification. The estimated coefficients essentially confirm the correlation pattern as presented in Table 1.

Increased values of GRO, SET/SEB and RIT each improve the unemployment situation, though the effect of growth is not statistically significant; the RIT sign is however counter-intuitive. Increased life expectancy is seen to hurt the unemployment outlook as discussed earlier. The EXG variable is not significant in any of the OLS equations reported in Table 2. One point of note is that while the SET/SEB variables are highly significant in each equation, the coefficient for *male unemployment* is double that for *general unemployment*, implying vey low relative impact of schooling on female unemployment. It would be of interest to re-examine if any of these predictions survive in the 2-stage procedure described below.

### **5.2 First-Stage Equations:**

The two first-stage equations as specified by (6) and (7) above are estimated with instruments for the ‘growth’ and ‘human capital’ variables. Recall that while RDP is the sole instrument for SET/SEB variables, we have two alternative candidates (governance effectiveness, GVE, and rule of law, ROL) for the growth equation. The four sets of results are presented in Tables 3A through 3D.

#### **(a) Growth:**

It appears difficult to pin down the first-stage growth equation well with the instruments that have been examined below, namely (GVE) and (ROL). One difficulty here is that EXG appears to be highly correlated with the GVE variable (coefficient being 0.72) and more moderately so with LET/LEM as already noted above. It is seen from Tables 3A and 3B that even though the coefficient of GVE in the growth equation (column 2 in these tables) is slightly more robust, the F-value is higher in 3B than in 3A, i.e., when EXG is dropped as an rhs variable. Similarly in the case of the ROL variable as an instrument for growth, dropping EXG improves the F-value of each equation (compare Tables 3C and 3D). Comparing column (2) in 3B and 3D one would conclude that GVE yields a better specification for the growth equation. Both the governance and the infrastructure variables turn out to be significant, though only at the 10 percent level. The overall equation is however adequately specified as seen from the F-test (p-value being 0.055). The RIT variable fails to be significant in explaining growth behaviour.

The estimated coefficient for GVE indicates that a doubling of the governance indicator from its mean of 0.45 (i.e., from the 45<sup>th</sup> to the 90<sup>th</sup> percentile) would lead to 1.6 percentage points increase in long-run growth rate, i.e., from the mean level of 4.1 to 5.7 percent per annum.<sup>12</sup> It may be noted that the GVE indicator actually varied from 0.06 to 0.89 for the entire sample. Kaufman (2006) claims that one standard deviation increase in governance can raise per capita income by 300 percent in the long-run (i.e., presumably by compounding growth over a 30-year term).

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<sup>12</sup> This is calculated as follows; the incremental growth would be 45 percent of the estimated coefficient of 3.53.

The estimated coefficients of RDP variable, an excellent instrument for the human capital variables (see below), from both the GRO and SET/B equations may be utilized to infer the impact of human capital on growth, which at 4.8 basis points, is seen to be statistically significant though small in magnitude.<sup>13</sup> In other words, one additional percentage point increase in long-run (total) enrolment is predicted to augment growth by nearly 5 basis points.

It has been noted by earlier writers that despite rapid growth in several of the indicators, human capital has failed to contribute significantly to growth. The present study also appears to confirm such a proposition. Pissarides and Végonzouès-Varoudakis (2006) suggest that by offering a non-market wage structure (on average by 30 percent in excess of that in the private sector), MENA governments have been rationing jobs leading to queuing especially on the part of the well educated and thus contributing to unemployment and consequent labour market rigidities. Human capital is being wasted through engagement in less productive public employment and high unemployment, hurting growth. Growth also suffers as public sector wage bill tend to be higher than they need to be putting burden on the revenue capacity of the state, and thereby undermining growth once more.

**(b) Human Capital Equations:**

The infrastructure variable, RDP, allows the enrolment equations to be estimated very well and the overall fit is highly significant in terms of the F-value. The EXG variable appears to add an element of multi-collinearity as already anticipated; for example, comparing SET/SEB equations in Tables 3A and 3B, it is seen that dropping EXG leads to a reversal of the sign of the LEM coefficient while that for LET turns from significant to not statistically different from zero. Examining the results for ROL as the instrument for GRO (i.e., Tables 3C and 3D), it is quite clear that Table 3D provides the best fit for both SET and SEB variables with very high values of the F-statistic (in the 74 to 77 range) as well as R-bar squared (0.78 and 0.79, respectively). It should be noted that GVE too yields strong results.

From Table 3B and 3D, it is seen that a one-percentage point increase in paved roads, RDP, (from the mean of 74 percent) is predicted to leads to almost an equal increase in the enrolment rate (between 78 and 75 basis points for boys and between 82 and 78 basis point generally, hence much more for girls). Increased real interest rate is also seen to lower enrolment rates as the opportunity cost of staying in school rises.<sup>14</sup> These signs are intuitive and expected.

**Governance (GOV/ROL):** At first sight, it appears awkward to encounter very strong and robust estimates of these variables on the enrolment behaviour, but the sign is negative; i.e., better economic governance or rule of law appears not to increase enrolment. However a closer look at the countries concerned suggests that this is to be expected. Morocco, for example, scores the best in the sample in terms of ROL, but it has the lowest enrolment figure in the sample, possibly the whole region (at barely around 50 percent as of 2006 in contrast to about 80 percent in the four other countries included here). There are also the signalling difficulties in the labour market as is often cited in the literature.

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<sup>13</sup> The coefficient is calculated as follows. Note that we may write  $(\partial \text{GRO} / \partial \text{SET}) = [(\partial \text{GRO} / \partial \text{RDP}) / (\partial \text{SET} / \partial \text{RDP})]$ .

<sup>14</sup> The RIT coefficient just misses the 10 percent level of significance in Table 3D, but is highly significant in all other cases (especially 3A and 3B).

**Life expectancy (LET/M):** From Tables 3B and 3D, it is seen that while the LET coefficient is inclusive and statistically insignificant, LEM appears to negatively impact on the enrolment outcome. (The coefficient is however not very precisely estimated for the GVE specification; it is significant only at the 10-percent level). A review of the data shows that while for each country both SET/B has steadily increased with LET/M, some countries possess relatively low expectancy but demonstrate very high enrolment performance, e.g., Egypt, which is a potential source of ambiguity. It may also help if a suitable lag structure is employed in treating the LET/M variable rather than contemporaneously. Thus to the extent the life expectancy variable features in the final-stage estimates for unemployment, one can argue that the impact to LET/M is not so much via SET/B, instead directly via labour force participation.

### 5.3 Second-Stage Equations: Explaining Unemployment

(i) ***The Overall Fit, GVE vs. ROL:***

The second-stage unemployment equations (both general and for males), as reported in Tables 4A through 4D, are each rather well specified with high F-values and most independent variables are highly significant with the correct *a-priori* sign. In these tables, GROF and SETF and SEBF denote respectively the *fitted* first-stage values of growth and secondary enrolment variables. While Tables 4A and 4B relate to GVE, 4C and 4D report results based on ROL as the governance indicator. The other dimension in which they differ is that Tables 4B and 4D treat the dependent variable in the logarithmic form. Though the quality of results are rather similar, on a pair-wise comparison of 4A with 4C (or, 4B with 4D), it is seen that the GVE indicator yields a dominant pattern of estimated equations than ROL, and hence the discussion from hereon focuses on Tables 4A and 4B.

(ii) ***Total and Male Unemployment (UET/M):*** The principal results are given by columns 2 and 4 in Tables 4A and 4B. Given the earlier remarks on the scope of multi-collinearity with EXG, it is safer to rely on estimates that exclude this variable. The important findings may then be grouped as follows.

**(a) Growth:**

The GDP growth coefficient appears to have a high t-value. A one-percentage point increase in the growth rate (from its mean level of 4.1) is predicted to lower unemployment by 3.15 percentage points, i.e., lower it from the mean of 16.41 to 13.26 percent. For male unemployment, the effect is slightly stronger (column 3). *Interpreted in gender terms, the above estimates suggest that the female unemployment elasticity of growth is lower than for males, which indicates that an equivalent amount of incremental growth does not lead to a commensurate decrease in female unemployment. Overall the unemployment elasticity of growth appears to be in excess of -3.0, higher than the well-known poverty elasticity of growth of about 2 or 2.5.*

**(b) Life Expectancy:**

Increased expectancy appears to positively affect the unemployment rate both generally and for males, where the associated t-values are also very high (4.3 and 6.6, respectively). Here a one-sd (which happens to be 2.7 years) increase in longevity is predicted to raise total unemployment by 3.65 percentage points, i.e., from its mean level of 16.4 to 20.05 percent. This is rather large. The predicted magnitude is even higher for males. As discussed in

section 5.2 above, the process by which increased expectancy affects unemployment is via participation. Hence the gender impact is that increased life expectancy by females is likely to make their employment prospects less harsh than for men. In view of evolving advances in medical technology, the longevity issue would appear to take a front seat in any labour market analysis. *Hence the growth and employment strategies have to adequately deal with not just the impact of population growth on participation, but also on labour force growth via longer life expectancy.*

**(c) Human Capital:**

Generally speaking, the human capital variables, in spite of these being well specified in the first-stage estimation, does not appear to materially influence the unemployment outcome (see columns 2 and 3 in Tables 4A and 4B). The logarithmic specification (Table 4B) however shows that increased secondary education by boys does indeed alleviate male unemployment. *Here a one percentage point increase in secondary enrolment by boys (from the mean of 69.3) is predicted to lower male unemployment by 12 basis points.*<sup>15</sup> *Interpreted in gender terms, the above estimates suggest that the female employment elasticity of education is significantly lower than for males, which is suggestive of a possible discrimination against females in the labour market.* Assaad (2007) points out that in the case of Egypt, educated women had traditionally been absorbed in public employment which has been drying up of late, thus slowing down overall job growth for women.

**(d) Economic Integration:**

In view of earlier remarks on the mutual correlation of the EXG variable with several of the explanatory variables, it is not useful at this stage to dwell further except to note that in spite of having a high export-GDP ratio vis-à-vis other developing regions, and presumably because the resource based trade is less diversified, this has not had much of an impact either on growth (as seen in stage-1 estimation) or on the employment potential.<sup>16</sup> *In view of the potential gains from greater economic integration via trade, merger and acquisition, and foreign direct investment (FDI), the pertinent question is how to evaluate if the former does indeed act as a catalyst for faster growth, access to appropriate technology and faster human capital enhancement.* Given that in the preset dataset the export share fails to perform the task, attention must therefore shift to additional indicators of economic integration such as FDI which may have better statistical properties of an explanatory variable in a growth and employment context.

**(e) Cost of Capital (RIT):**

It was seen in the first stage that even though increased real interest rate lowered the enrolment figures, the direct impact on growth was negligible. The second-stage equations reveal that the impact on unemployment is also statistically insignificant. Among possible explanation behind this would be the hypothesis that in most of the period covered here (especially the 1990s), the nominal rates of interest set by the monetary authorities had been largely in the nature of administered prices without much regard as to the needs of the day. Most credit issued by the banking system had been of a directed nature with significant rationing. Whenever authorities attempted to target an economic event these were in the

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<sup>15</sup> This is calculated by using the relationship between the derivative of logarithm of a variable and the ordinary derivative. Here the coefficient of SEBF (0.0081) in column 2 of Table 4B is multiplied by the mean value of UEM, which is 15.14, to yield 0.1226.

<sup>16</sup> The estimated coefficients in the employment equations are inconsistent as to sign; these (though not statistically significant) suggest that increased export share predicts rising unemployment!

nature of a reaction to the event, rather than in anticipation thereof. Market forces played very little role in the shaping of monetary policy.

#### **5.4 The Growth Sustainability Hypothesis**

Tables 6A through 6D present the test of the growth sustainability hypothesis, namely that growth volatility is bad for the unemployment outlook.<sup>17</sup> Not only is the hypothesis confirmed by the results reported here, these new estimates provide a significant improvement in the overall model specification. Most estimated coefficients are more stable than before (especially as regards SET/B, LET/M and RIT). The overall fit in terms of the F-value and adjusted R-squared improve significantly from those reviewed earlier, namely, Tables 4A through 4D.

It is seen that growth volatility is uniformly predicted to increase unemployment. Both GRO and GRO-squared terms have very high t-values (between 7 and 9) and with the correct sign. Focussing on Table 6A (columns 2 and 3), we note that secondary enrolment now appears to confirm the anticipated reduction in unemployment, though the coefficient is double for men than generally. This once again confirms the strong discrimination against women's skills in the labour market.

On the life expectancy issue, the new tests (contrast Table 6A with 4A) also confirm the worsening effect on unemployment. Moreover, all coefficients are more dense than earlier, and all are highly significant (t-values between 6 and 7), which reveal that the rising longevity is likely to add more than proportionately (one extra year adding more than one percentage point to the unemployment queue) mainly via participation. The impact for men is more severe (the elasticity being close to 2) than generally, i.e., the impact is less serious for females.

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<sup>17</sup> While the tables cited here use the GRO-squared term as measuring the volatility of growth, the relative dispersion can alternatively be measured by the ratio of the country's standard deviation in growth to the observed growth rate. Both sets of results turn out to be rather similar, and hence we present the first set in Tables 6A through 6D.

## VI. Policy Framework and Conclusion:

While tentative at this stage and further tests using an expanded dataset would be in order to validate the empirical findings in a more robust setting, the study does reach some fairly striking conclusions. The paper uses a sample of 5 Arab countries (namely Algeria, Egypt, Jordan, Morocco and Tunisia) in a dataset that covers the period from 1990 to 2006. Two-stage least squares methodology is used to find estimates of growth and human capital variables from a search of deeper instruments, and fitted values from these regressions are then used in second-stage estimation of unemployment behaviour in the general population and separately for men.

The first major observation of the paper relates to the generally accepted view that in spite of healthy growth of late, the unemployment reduction in most diversified Arab economies had been less than commensurate. This study points out that this may have been due to growth volatility. In other words, while growth by itself does tend to achieve significant reduction in unemployment, the lack of sustainability of growth is the villain of the piece; it works in the opposite direction raising unemployment so that the net effect is rather modest. What policies will suffice here? How does one provide an enabling environment such that growth becomes more predictable? The standard answer must lie in the provision of a sound macro policy framework by the state, especially monetary policy. In many contexts the case for a transparent monetary policy stance has been emphasized to a great deal, and central bank independence would be high on the agenda here. Low inflation, low budgetary deficits and predictable public borrowing behaviour are key ingredients of a stable macro policy environment. The financial markets must be allowed to function independent of directed credit policy of the state, but within a credible regulatory framework. Elsewhere Rodrik (2000) has argued that prevalence of 'participatory institutions' primarily obtaining in a democratic regime offer better prospects of resiliency to shocks and thus reduced growth volatility.<sup>18</sup>

The second major finding is that while educational contribution to lowering of unemployment is likely to be of a modest magnitude for all, the labour market appears to strongly discriminate against women's skills. Part of the problem may well be due to a mis-match of required job skills and women's schooling. Earlier we cited the folly of preparing oneself exclusively for civil service jobs. Institutions need to be developed and nurtured so that the labour market can deliver the right signals to those acquiring human capital.

Our next result suggests that since continuing medical and nutritional advances are likely to lead to rising life expectancy, the labour market implications are rather serious, especially for

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<sup>18</sup> Rodrik (2000) contended that democracies deliver more predictable long run growth. Using the *index of political and civil liberties* compiled by Freedom House, he detects that the variability in growth (e.g., measured by the coefficient of variation) is significantly smaller in democracies than in authoritarian regimes. This is so even when he found "no strong, determinate relationship between political participation and average level of long run growth" (p24). His thesis is that adjustment to shock requires managing social conflicts, and democratic institutions are useful in this regard. In particular, he finds that "political regimes with lower executive autonomy and more participatory institutions handle exogenous shocks better"(p 31).

men. Rising longevity appears to predict rising unemployment via participation. What can the society do to increase the rate of job creation in order meet the growing aspiration of the public? Faster and stable labour-intensive growth strategy is the order of the day. Capital market innovations that encourage small enterprise growth, which in other parts of the world (e.g., South and South-east Asia) appear to contribute more to job creation than larger enterprises, may form part of such a strategy. Niche export oriented product developed has also been cited in similar contexts elsewhere, which essentially calls for diversification of the product base of the economy. Can FDI play a role here? How hospitable is the local environment?

Finally, we put forward that while the trade-GDP ratio is fairly high for these countries vis-à-vis other developing regions, the overall impact on growth or employment or educational attainment has been very limited. Strategies need to be framed so that human capital acquisition, technology access and thus faster growth may result from greater exposure to globalization. Failure of trade to accelerate growth, in spite of the volatility setback, is suggestive of the inability to fully exploit the comparative advantage that lies within each country's technology. Modality should be found to delve deeper into the search for significant comparative advantage and the hindrances that stand in the way. The focus here is on applied research with actual country-specific data on capital and labour productivity.

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## Appendix: Tables and Figures

**Table (1)**  
**Correlation Matrix , 1990-2006**

	UET	UEM	GRO	GVE	ROL	EXG	SET	SEB	LET	LEM	RIT	RDP
UET	1											
UEM	0.92	1										
GRO	-0.2	-0.19	1									
GVE	-0.35	-0.25	0.28	1								
ROL	-0.38	-0.35	0.22	0.86	1							
EXG	0.07	0.15	0.21	0.72	0.46	1						
SET	-0.26	-0.23	0.18	-0.04	-0.33	0.22	1					
SEB	-0.31	-0.29	0.16	-0.13	-0.39	0.1	0.99	1				
LET	0.13	0.22	0.18	0.48	0.14	0.58	0.32	0.21	1			
LEM	0.2	0.3	0.18	0.46	0.09	0.64	0.37	0.26	0.99	1		
RIT	-0.28	-0.38	0.1	0.28	0.47	-0.05	-0.21	-0.2	0.07	0	1	
RDP	-0.19	-0.21	0.23	0.22	-0.01	0.52	0.74	0.7	0.24	0.33	-0.01	1

**Table(2)**  
**OLS in Log with data not Normalized<sup>19</sup>**

	Dependent Variables	Dependent Variables	Dependent Variables	Dependent Variables
Independent Variables	Log(UET)	Log(UEM)	log(UET)	log(UEM)
<b>Constant</b>	-0.230949441	-3.333466048	0.199213431	-3.032088428
<b>Std error</b>	0.918092626	1.009528564	1.051429862	1.233750743
<b>t-stat</b>	(NS)-0.25155	***-3.30200	(NS)0.18947	(**)-2.45762
<b>GRO</b>	-0.012884502	-0.016702401	-0.014367373	-0.017027780
<b>Std error</b>	0.009443345	0.010736393	0.009502827	0.010907668
<b>t-stat</b>	(NS)-1.36440	(NS)-1.55568	(NS)-1.51191	(NS)-1.56108
<b>SET</b>	-0.009384746		-0.009410296	
<b>Std error</b>	0.002016636		0.002008710	
<b>t-stat</b>	***-4.65366		***-4.68475	
<b>SEB</b>		-0.018547305		-0.018391191
<b>Std error</b>		0.002420167		0.002451749
<b>t-stat</b>		***-7.66365		***-7.50125
<b>LET</b>	0.054595491		0.047116314	
<b>Std error</b>	0.013851009		0.016576682	
<b>t-stat</b>	***3.94163		***2.84232	
<b>LEM</b>		0.110978620		0.105378876
<b>Std error</b>		0.015408386		0.020095993
<b>t-stat</b>		***7.20248		***5.24378
<b>EXG</b>			0.002889490	0.001607078
<b>Std error</b>			0.003330519	0.004068328
<b>t-stat</b>			(NS)0.86758	(NS)0.39502
<b>RIT</b>	-0.022609817	-0.036815428	-0.023088773	-0.035602975
<b>Std error</b>	0.006057197	0.006831021	0.006126778	0.006958540
<b>t-stat</b>	***-3.73272	***-5.38945	***-3.76850	***-5.11644
<b>Number of Observations</b>	85	85	85	85
<b>Degree Of Freedom</b>	80	80	79	79
<b>F-Statistics</b>	9.6428	27.2214	8.1616	21.1039
<b>P-value of F</b>	0.00000205	0.0000000	0.00000310	0.00000000
<b>R-Squared</b>	0.325300	0.576463	0.343478	0.574978
<b>Adjusted R-Squared</b>	0.291566	0.555286	0.301394	0.547732

<sup>19</sup> Unless otherwise stated, the statistical significance of the estimated coefficients in the following tables will be identified as follows. The asterisks (\*\*\*, \*\*, \*) against the t-statistics shall denote rejection of the null hypothesis that the coefficient is 0 at the 1-percent, 5-percent and 10-percent levels of significance, respectively, while NS denotes significance at higher than the 10-percent level.

**Table (3A)**  
**First-stage with GVE and RDP as Instruments**

Independent Variables	Dependent Variables GRO	Dependent Variables SET	Dependent Variables SEB
<b>Constant</b>	-1.389287922	-61.00093048	-58.74293561
<b>Std error</b>	2.320017692	5.34507602	5.06022464
<b>t-stat</b>	-0.59883	***-11.41255	***-11.60876
<b>GVE</b>	4.135673732	-10.72568862	-9.23397381
<b>Std error</b>	2.062749950	4.75235828	4.48294878
<b>t-stat</b>	**2.00493	** -2.25692	** -2.05980
<b>RDP</b>	0.047890855	0.93106682	0.88730739
<b>Std error</b>	0.026940355	0.06206774	0.05857230
<b>t-stat</b>	*1.77766	***15.00082	***15.14893
<b>EXG</b>	-0.037925110	-0.48876619	-0.59854119
<b>Std error</b>	0.057499177	0.13247204	0.13261708
<b>t-stat</b>	(NS)-0.65958	***-3.68958	***-4.51330
<b>LET</b>	0.03500143	1.47514860	
<b>Std error</b>	0.288046644	0.66362908	
<b>t-stat</b>	(NS)0.12151	**2.22285	
<b>LEM</b>			0.80180929
<b>Std error</b>			0.64795176
<b>t-stat</b>			(NS)1.23745
<b>RIT</b>	0.016085582	-0.55382589	-0.49768040
<b>Std error</b>	0.073667462	0.16972206	0.16391543
<b>t-stat</b>	(NS)0.21835	***-3.26313	***-3.03620
<b>Number of Observations</b>	85	85	85
<b>Degree Of Freedom</b>	79	79	79
<b>F-Statistics</b>	2.0073	56.6600	54.9703
<b>P-value of F</b>	0.08659771	0.00000000	0.00000000
<b>R-Squared</b>	0.112724	0.781949	0.776742
<b>Adjusted R-Squared</b>	0.056567	0.768148	0.762612

**Table (3B)**  
**First-stage with GVE and RDP as Instruments (without EXG)**

<b>Independent Variables</b>	<b>Dependent Variables GRO</b>	<b>Dependent Variables SET</b>	<b>Dependent Variables SEB</b>
<b>Constant</b>	-0.486234120	-49.36267385	-46.26123648
<b>Std error</b>	1.866322608	4.64279194	4.72288864
<b>t-stat</b>	(NS)-0.26053	***-10.63211	***-9.79511
<b>GVE</b>	3.534736310	-18.47036996	-18.72735644
<b>Std error</b>	1.844086680	4.58747632	4.41215591
<b>t-stat</b>	*1.91680	***-4.02626	***-4.24449
<b>RDP</b>	0.039228029	0.81942321	0.77808494
<b>Std error</b>	0.023438763	0.05830787	0.05944685
<b>t-stat</b>	*1.67364	***14.05339	***13.08875
<b>LET</b>	-0.069818712	0.12426158	
<b>Std error</b>	0.239390076	0.59552315	
<b>t-stat</b>	(NS)-0.29165	(NS)0.20866	
<b>LEM</b>			-0.98879789
<b>Std error</b>			0.57094816
<b>t-stat</b>			*-1.73185
<b>RIT</b>	0.017777956	-0.53201515	-0.51883662
<b>Std error</b>	0.073362342	0.18250119	0.18261004
<b>t-stat</b>	(NS)0.24233	***-2.91513	***-2.84123
<b>Number of Observations</b>	85	85	85
<b>Degree Of Freedom</b>	80	80	80
<b>F-Statistics</b>	2.4174	58.2395	51.2190
<b>P-value of F</b>	0.05535262	0.00000000	0.000000000
<b>R-Squared</b>	0.107838	0.744375	0.719176
<b>Adjusted R-Squared</b>	0.063229	0.731594	0.705135

**Table (3C)**  
**First-stage with ROL and RDP as Instruments**

<b>Independent Variables</b>	<b>Dependent Variables</b>	<b>Dependent Variables</b>	<b>Dependent Variables</b>
	<b>GRO</b>	<b>SET</b>	<b>SEB</b>
<b>Constant</b>	-3.445769208	-48.54113238	-45.90431729
<b>Std error</b>	2.968475802	6.46286039	6.08624277
<b>t-stat</b>	(NS)-1.16079	***-7.51078	***-7.54231
<b>ROL</b>	4.723617904	-20.19438884	-20.39055206
<b>Std error</b>	2.392504123	5.20887525	5.08389524
<b>t-stat</b>	*1.97434	***-3.87692	***-4.01081
<b>RDP</b>	0.060866069	0.86211595	0.82495036
<b>Std error</b>	0.028703196	0.06249158	0.05780587
<b>t-stat</b>	**2.12053	***13.79571	***14.27105
<b>EXG</b>	-0.060001870	-0.30875147	-0.37254098
<b>Std error</b>	0.063498078	0.13824577	0.14072881
<b>t-stat</b>	(NS)-0.94494	** -2.23335	***-2.64723
<b>LET</b>	0.292206946	0.48291166	
<b>Std error</b>	0.302769026	0.65917800	
<b>t-stat</b>	(NS)0.96512	(NS)0.73260	
<b>LEM</b>			-0.32607529
<b>Std error</b>			0.66591378
<b>t-stat</b>			(NS)-0.48967
<b>RIT</b>	-0.009150096	-0.35825149	-0.31379235
<b>Std error</b>	0.079331464	0.17271765	0.16243225
<b>t-stat</b>	(NS)-0.11534	** -2.07420	*-1.93184
<b>Number of Observations</b>	85	85	85
<b>Degree Of Freedom</b>	79	79	79
<b>F-Statistics</b>	1.9812	65.2221	65.0395
<b>P-value of F</b>	0.09048692	0.00000000	0.00000000
<b>R-Squared</b>	0.111421	0.804992	0.804551
<b>Adjusted R-Squared</b>	0.055182	0.792649	0.792181

**Table (3D)**  
**First-stage with ROL and RDP as Instruments (without EXG)**

Independent Variables	Dependent Variables	Dependent Variables	Dependent Variables
	<b>GRO</b>	<b>SET</b>	<b>SEB</b>
<b>Constant</b>	-1.503372336	-38.54614558	-34.96579198
<b>Std error</b>	2.140166360	4.77741460	4.63334843
<b>t-stat</b>	(NS)-0.70246	***-8.06841	***-7.54655
<b>ROL</b>	3.407268701	-26.96792368	-28.83525649
<b>Std error</b>	1.943816157	4.33910927	4.10445174
<b>t-stat</b>	*1.75288	***-6.21508	***-7.02536
<b>RDP</b>	0.045274946	0.78188875	0.74790167
<b>Std error</b>	0.023471227	0.05239396	0.05178527
<b>t-stat</b>	*1.92896	***14.92326	***14.44236
<b>LET</b>	0.090086700	-0.55713800	
<b>Std error</b>	0.214138968	0.47801454	
<b>t-stat</b>	(NS)0.42069	(NS)-1.16553	
<b>LEM</b>			-1.66148049
<b>Std error</b>			0.45073023
<b>t-stat</b>			***-3.68620
<b>RIT</b>	0.00476819	-0.28663216	-0.25712892
<b>Std error</b>	0.077899905	0.17389309	0.16695225
<b>t-stat</b>	(NS)0.06121	(NS)-1.64832	(NS)-1.54013
<b>Number of Observations</b>	85	85	85
<b>Degree Of Freedom</b>	80	80	80
<b>F-Statistics</b>	2.2563	76.4689	73.9909
<b>P-value of F</b>	0.07027853	0.00000000	0.00000000
<b>R-Squared</b>	0.101377	0.792679	0.787213
<b>Adjusted R-Squared</b>	0.056446	0.782313	0.776574

**Table (4A)**  
**Second Stage with GVE and RDP as Instruments**

Independent Variables	Dependent Variables	Dependent Variables	Dependent Variables	Dependent Variables
	UET	UEM	UET	UEM
<b>Constant</b>	29.30772323	29.16132707	33.46916342	31.00352871
<b>Std error</b>	2.22770692	2.24400496	2.08088979	2.30110386
<b>t-stat</b>	***13.15600	***12.99522	***16.08406	***13.47333
<b>GROF</b>	-3.15163478	-3.22132845	-4.19185250	-3.68103630
<b>Std error</b>	0.59069728	0.59573464	0.54737757	0.60246718
<b>t-stat</b>	***-5.33545	***-5.40732	***-7.65806	***-6.10994
<b>SETF</b>	0.05145124		0.03977697	
<b>Std error</b>	0.04430617		0.03818981	
<b>t-stat</b>	(NS)1.16127		(NS)1.04156	
<b>SEBF</b>		-0.03964579		-0.03600459
<b>Std error</b>		0.04686119		0.04390800
<b>t-stat</b>		(NS)-0.84603		(NS)-0.82000
<b>LET</b>	1.35075730		0.67007259	
<b>Std error</b>	0.31367191		0.34361129	
<b>t-stat</b>	***4.30627		*1.95009	
<b>LEM</b>		2.08560926		1.78516224
<b>Std error</b>		0.31525196		0.39511536
<b>t-stat</b>		***6.61569		***4.51808
<b>EXG</b>			0.22092187	0.08689971
<b>Std error</b>			0.05982086	0.07230267
<b>t-stat</b>			***3.69306	(NS)1.20189
<b>RIT</b>	0.00942154	-0.14472667	0.03109377	-0.13556412
<b>Std error</b>	0.11533721	0.11858697	0.10022794	0.11075657
<b>t-stat</b>	(NS)0.08169	(NS)-1.22043	0.31023	(NS)-1.22398
<b>Number of Observations</b>	85	85	85	85
<b>Degree Of Freedom</b>	80	80	79	79
<b>F-Statistics</b>	11.1327	20.4597	17.2202	21.0205
<b>P-value of F</b>	0.00000031	0.00000000	0.00000000	0.00000000
<b>R-Squared</b>	0.357589	0.505681	0.521505	0.570891
<b>Adjusted R-Squared</b>	0.325469	0.480965	0.491221	0.543732

**Table(4B)**  
**Second Stage in log with GVE and RDP as Instruments**

	Dependent Variables	Dependent Variables	Dependent Variables	Dependent Variables
Independent Variables	Log(UET)	Log(UEM)	log(UET)	log(UEM)
<b>Constant</b>	3.401995040	3.374759865	3.690236792	3.606284958
<b>Std error</b>	0.137887716	0.169979547	0.125232104	0.167080960
<b>t-stat</b>	***24.67221	***19.85392	***29.46718	***21.58406
<b>GROF</b>	-0.159559716	-0.171673537	-0.231615737	-0.229206431
<b>Std error</b>	0.036562215	0.045125883	0.032942276	0.043744568
<b>t-stat</b>	***-4.36406	***-3.80433	***-7.03096	***-5.23965
<b>SETF</b>	0.000925434		0.000117904	
<b>Std error</b>	0.002742406		0.002298339	
<b>t-stat</b>	(NS)0.33745		(NS)0.05130	
<b>SEBF</b>		-0.008070643		-0.007806313
<b>Std error</b>		0.003549655		0.003188118
<b>t-stat</b>		** -2.27364		** -2.44856
<b>LET</b>	0.094213642		0.047073788	
<b>Std error</b>	0.019415257		0.020679214	
<b>t-stat</b>	***4.85256		**2.27638	
<b>LEM</b>		0.170575103		0.132146290
<b>Std error</b>		0.023879798		0.028688950
<b>t-stat</b>		***7.14307		***4.60617
<b>EXG</b>			0.015298125	0.011511355
<b>Std error</b>			0.003600139	0.005249828
<b>t-stat</b>			***4.24932	**2.19271
<b>RIT</b>	-0.000462463	-0.009788147	0.001040382	-0.008838386
<b>Std error</b>	0.007138993	0.008982761	0.006031918	0.008041929
<b>t-stat</b>	(NS)-0.06478	(NS)-1.08966	(NS)0.17248	(NS)-1.09904
<b>Number of Observations</b>	85	85	85	85
<b>Degree Of Freedom</b>	80	80	79	79
<b>F-Statistics</b>	9.7955	19.4026	17.6284	23.2261
<b>P-value of F</b>	0.00000168	0.00000000	0.00000000	0.00000000
<b>R-Squared</b>	0.328758	0.492419	0.527348	0.595143
<b>Adjusted R-Squared</b>	0.295196	0.467040	0.497433	0.569519

**Table (4C)**  
**Second Stage with ROL and RDP as Instruments**

Independent Variables	Dependent Variables	Dependent Variables	Dependent Variables	Dependent Variables
	UET	UEM	UET	UEM
<b>Constant</b>	27.63265784	28.82513819	32.72289134	31.17135925
<b>Std error</b>	2.39290784	2.35340944	2.10360897	2.23959431
<b>t-stat</b>	***11.54773	***12.24825	***15.55560	***13.91831
<b>GROF</b>	-2.67102176	-3.11814805	-3.98238353	-3.71981118
<b>Std error</b>	0.63137621	0.62126885	0.54815127	0.58003002
<b>t-stat</b>	***-4.23048	***-5.01900	***-7.26512	***-6.41314
<b>SETF</b>	0.02508051		0.03057844	
<b>Std error</b>	0.04377592		0.03727313	
<b>t-stat</b>	(NS)0.57293		(NS)0.82039	
<b>SEBF</b>		-0.05221685		-0.03923477
<b>Std error</b>		0.04428233		0.04111677
<b>t-stat</b>		(NS)-1.17918		(NS)-0.95423
<b>LET</b>	1.25519667		0.66335633	
<b>Std error</b>	0.33353985		0.35523492	
<b>t-stat</b>	***3.76326		*1.86737	
<b>LEM</b>		2.07487163		1.76948411
<b>Std error</b>		0.32746310		0.39558976
<b>t-stat</b>		***6.33620		***4.47303
<b>EXG</b>			0.21284820	0.09149167
<b>Std error</b>			0.06186181	0.07206531
<b>t-stat</b>			***3.44070	1.26957
<b>RIT</b>	-0.04582919	-0.16071687	0.01051118	-0.13657564
<b>Std error</b>	0.12030789	0.12022366	0.10152504	0.10850312
<b>t-stat</b>	(NS)-0.38093	(NS)-1.33682	(NS)0.10353	(NS)-1.25873
<b>Number of Observations</b>	85	85	85	85
<b>Degree Of Freedom</b>	80	80	79	79
<b>F-Statistics</b>	7.9930	18.3792	15.0926	20.9223
<b>P-value of F</b>	0.00001792	0.00000000	0.00000000	0.00000000
<b>R-Squared</b>	0.285535	0.478885	0.488551	0.569744
<b>Adjusted R-Squared</b>	0.249812	0.452829	0.456181	0.542513

**Table (4D)**  
**Second Stage in log with ROL and RDP as Instruments**

Independent Variables	Dependent Variables	Dependent Variables	Dependent Variables	Dependent Variables
	Log(UET)	Log(UEM)	log(UET)	log(UEM)
<b>Constant</b>	3.286335478	3.331517248	3.639219129	3.624759880
<b>Std error</b>	0.146795416	0.176028479	0.127497131	0.163290770
<b>t-stat</b>	***22.38718	***18.92601	***28.54354	***22.19819
<b>GROF</b>	-0.126386859	-0.158742585	-0.217313259	-0.233797346
<b>Std error</b>	0.038732429	0.046469182	0.033222769	0.042290493
<b>t-stat</b>	***-3.26308	***-3.41608	***-6.54109	***-5.52837
<b>SETF</b>	-0.000889757		-0.000506331	
<b>Std error</b>	0.002685479		0.002259078	
<b>t-stat</b>	(NS)-0.33132		(NS)-0.22413	
<b>SEBF</b>		-0.009282850		-0.007965660
<b>Std error</b>		0.003312195		0.002997859
<b>t-stat</b>		***-2.80263		***-2.65712
<b>LET</b>	0.087591208		0.046572564	
<b>Std error</b>	0.020461348		0.021530348	
<b>t-stat</b>	***4.28081		**2.16311	
<b>LEM</b>		0.168261117		0.131209454
<b>Std error</b>		0.024493329		0.028842794
<b>t-stat</b>		***6.86967		***4.54912
<b>EXG</b>			0.014746111	0.011907437
<b>Std error</b>			0.003749368	0.005254345
<b>t-stat</b>			***3.93296	**2.26621
<b>RIT</b>	-0.004273087	-0.011606352	-0.000363477	-0.008734254
<b>Std error</b>	0.007380413	0.008992395	0.006153307	0.007911057
<b>t-stat</b>	(NS)-0.57898	(NS)-1.29069	(NS)-0.05907	(NS)-1.10406
<b>Number of Observations</b>	85	85	85	85
<b>Degree Of Freedom</b>	80	80	79	79
<b>F-Statistics</b>	7.2737	18.3330	15.0356	22.8005
<b>P-value of F</b>	0.00004769	0.00000000	0.00000000	0.00000000
<b>R-Squared</b>	0.266694	0.478257	0.487605	0.590679
<b>Adjusted R-Squared</b>	0.230029	0.452170	0.455175	0.564773

**Table 5:**  
**Testing Growth Sustainability, OLS: Normalized Data in Log<sup>20</sup>**

Independent Variables	Dependent Variables Log(UET)	Dependent Variables Log(UEM)	Dependent Variables log(UET)	Dependent Variables log(UEM)
<b>Constant</b>	2.917333603	2.854241199	2.930169434	2.855647718
<b>Std error</b>	0.057337083	0.064766171	0.057297261	0.066225445
<b>t-stat</b>	***50.88040	***44.06994	***51.13978	***43.12010
<b>GRO</b>	-0.029688660	-0.028296341	-0.029515304	-0.028330205
<b>Std error</b>	0.014847642	0.016790106	0.014696110	0.016898211
<b>t-stat</b>	** -1.99955	* -1.68530	** -2.00838	* -1.67652
<b>GROS</b>	0.001532706	0.001034217	0.001365347	0.001024140
<b>Std error</b>	0.001142253	0.001295184	0.001135245	0.001306058
<b>t-stat</b>	(NS)1.34183	(NS)0.79851	(NS)1.20269	(NS)0.78415
<b>SET</b>	-0.007716169		-0.008189745	
<b>Std error</b>	0.002146343		0.002144270	
<b>t-stat</b>	***-3.59503		***-3.81936	
<b>SEB</b>		-0.016756757		-0.016754801
<b>Std error</b>		0.002562351		0.002578539
<b>t-stat</b>		***-6.53960		***-6.49779
<b>LET</b>	0.067393094		0.039829290	
<b>Std error</b>	0.017751838		0.024419378	
<b>t-stat</b>	***3.79640		(NS)1.63105	
<b>LEM</b>		0.134152085		0.131516314
<b>Std error</b>		0.019170132		0.029279723
<b>t-stat</b>		***6.99797		***4.49172
<b>EXG</b>			0.006426749	0.000585392
<b>Std error</b>			0.003954049	0.004891969
<b>t-stat</b>			(NS)1.62536	(NS)0.11966
<b>RIT</b>	-0.017492240	-0.027966440	-0.019138700	-0.028149284
<b>Std error</b>	0.006175051	0.007028339	0.006195246	0.007235770
<b>t-stat</b>	***-2.83273	***-3.97910	***-3.08926	***-3.89030
<b>Number of Observations</b>	85	85	85	85
<b>Degree Of Freedom</b>	79	79	78	79
<b>F-Statistics</b>	7.7796	22.3295	7.0580	18.3781
<b>P-value of F</b>	0.00000541	0.00000000	0.00000502	0.00000000
<b>R-Squared</b>	0.329928	0.585623	0.351879	0.585699
<b>Adjusted R-Squared</b>	0.287518	0.559396	0.302024	0.553830

<sup>20</sup> The next 5 tables (Table 5 and Tables 6A through 6D) test the growth sustainability hypothesis by adding GRO-Squared term as an additional explanatory variable.

**Table (6A)**  
**Testing Growth Sustainability, Second Stage (with GVE & RDP)**

Independent Variables	Dependent Variables	Dependent Variables	Dependent Variables	Dependent Variables
	UET	UEM	UET	UEM
<b>Constant</b>	77.44574911	73.98725481	69.79116360	65.17787731
<b>Std error</b>	6.25859905	6.78476281	4.89054724	5.82169784
<b>t-stat</b>	***12.37429	***10.90491	***14.27062	***11.19568
<b>GROF</b>	-28.69049129	-27.05518738	-24.04641287	-22.41003963
<b>Std error</b>	3.23071072	3.51207386	2.56580364	3.05736913
<b>t-stat</b>	***-8.88055	***-7.70348	***-9.37188	***-7.32984
<b>GROS</b>	3.10086790	2.90480953	2.45202241	2.32189427
<b>Std error</b>	0.38857091	0.42411193	0.31276293	0.37401007
<b>t-stat</b>	***7.98019	***6.84916	***7.83988	***6.20811
<b>SETF</b>	-0.09835287		-0.03943931	
<b>Std error</b>	0.03811805		0.03046699	
<b>t-stat</b>	** -2.58022		(NS)-1.29449	
<b>SEBF</b>		-0.18465601		-0.12099293
<b>Std error</b>		0.04293607		0.03865615
<b>t-stat</b>		***-4.30072		***-3.12998
<b>LET</b>	1.37231564		1.05817379	
<b>Std error</b>	0.23488438		0.26330365	
<b>t-stat</b>	***5.84252		***4.01883	
<b>LEM</b>		1.78346787		1.90396448
<b>Std error</b>		0.25513028		0.32587347
<b>t-stat</b>		***6.99042		***5.84265
<b>EXG</b>			0.13377700	0.01326614
<b>Std error</b>			0.04637490	0.06069920
<b>t-stat</b>			***2.88469	(NS)0.21856
<b>RIT</b>	0.15065043	-0.03145370	0.18091838	-0.00761227
<b>Std error</b>	0.08815725	0.09596163	0.07781761	0.09348958
<b>t-stat</b>	*1.70888	(NS)-0.32777	**2.32490	(NS)-0.08142
<b>Number of Observations</b>	85	85	85	85
<b>Degree Of Freedom</b>	79	79	78	78
<b>F-Statistics</b>	28.6214	35.1432	35.5774	32.2645
<b>P-value of F</b>	0.000000	0.00000000	0.000000	0.000000
<b>R-Squared</b>	0.644316	0.689851	0.732386	0.712799
<b>Adjusted R-Squared</b>	0.621804	0.670221	0.711800	0.690707

**Table (6B)**  
**Testing Growth Sustainability, Second Stage in Log (with GVE & RDP)**

Independent Variables	Dependent Variables Log(UET)	Dependent Variables Log(UEM)	Dependent Variables log(UET)	Dependent Variables log(UEM)
<b>Constant</b>	6.416978370	6.925065155	5.852655306	6.139840806
<b>Std error</b>	0.383633898	0.499499592	0.296792107	0.418245280
<b>t-stat</b>	***16.72683	***13.86401	***19.71971	***14.68000
<b>GROF</b>	-1.759110294	-2.059363981	-1.413650895	-1.617703296
<b>Std error</b>	0.198033160	0.258561648	0.155710645	0.219649017
<b>t-stat</b>	***-8.88291	***-7.96469	***-9.07870	***-7.36495
<b>GROS</b>	0.194213618	0.230066864	0.145980422	0.172136384
<b>Std error</b>	0.023818266	0.031223455	0.018980610	0.026869816
<b>t-stat</b>	***8.15398	***7.36840	***7.69103	***6.40631
<b>SETF</b>	-0.008457139		-0.004598244	
<b>Std error</b>	0.002336525		0.001848947	
<b>t-stat</b>	***-3.61954		** -2.48695	
<b>SEBF</b>		-0.019555750		-0.014107024
<b>Std error</b>		0.003160987		0.002777154
<b>t-stat</b>		***-6.18660		***-5.07967
<b>LET</b>	0.095564869		0.070181067	
<b>Std error</b>	0.014397729		0.015979080	
<b>t-stat</b>	***6.63750		***4.39206	
<b>LEM</b>		0.146644885		0.140953834
<b>Std error</b>		0.018782893		0.023411562
<b>t-stat</b>		***7.80736		***6.02069
<b>EXG</b>			0.010109774	0.006052443
<b>Std error</b>			0.002814348	0.004360782
<b>t-stat</b>			***3.59223	(NS)1.38793
<b>RIT</b>	0.008383063	-0.000816696	0.009960223	
<b>Std error</b>	0.005403783	0.007064771	0.004722509	
<b>t-stat</b>	(NS)1.55133	(NS)-0.11560	**2.10910	
<b>Number of Observations</b>	85	85	85	85
<b>Degree Of Freedom</b>	79	79	78	78
<b>F-Statistics</b>	27.5492	36.7210	35.3630	36.0053
<b>P-value of F</b>	0.000000	0.000000	0.000000	0.000000
<b>R-Squared</b>	0.635518	0.699168	0.731199	0.734723
<b>Adjusted R-Squared</b>	0.612450	0.680128	0.710522	0.714317

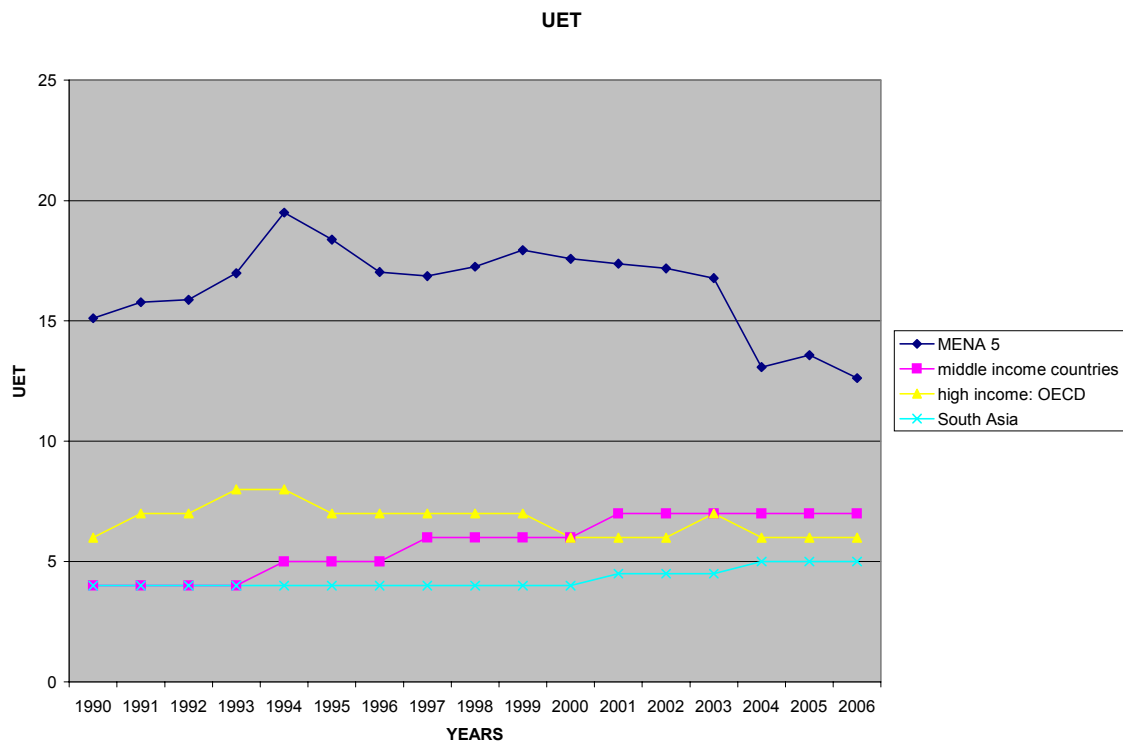
**Table (6C)**  
**Testing Growth Sustainability, Second Stage (with ROL & RDP)**

Independent Variables	Dependent Variables	Dependent Variables	Dependent Variables	Dependent Variables
	UET	UEM	UET	UEM
<b>Constant</b>	83.83024270	80.98728156	68.62512118	65.34774124
<b>Std error</b>	6.60395352	6.98371175	5.14060163	5.87688396
<b>t-stat</b>	***12.69395	***11.59660	***13.34963	***11.11945
<b>GROF</b>	-31.90963603	-30.27512443	-24.29489342	-23.01915683
<b>Std error</b>	3.34924989	3.54633895	2.79140918	3.18590879
<b>t-stat</b>	***-9.52740	***-8.53701	***-8.70345	***-7.22530
<b>GROS</b>	3.51731570	3.27349813	2.61404734	2.48301129
<b>Std error</b>	0.39923127	0.42367475	0.35506765	0.40522085
<b>t-stat</b>	***8.81022	***7.72644	***7.36211	***6.12755
<b>SETF</b>	-0.16421083		-0.10429671	
<b>Std error</b>	0.03795304		0.03414401	
<b>t-stat</b>	***-4.32668		***-3.05461	
<b>SEBF</b>		-0.22619613		-0.17134279
<b>Std error</b>		0.04047321		0.04025772
<b>t-stat</b>		***-5.58879		***-4.25615
<b>LET</b>	1.15433409		0.84356548	
<b>Std error</b>	0.23865052		0.27568998	
<b>t-stat</b>	***4.83692		***3.05983	
<b>LEM</b>		1.59717979		1.62342941
<b>Std error</b>		0.25626770		0.32796651
<b>t-stat</b>		***6.23247		***4.94999
<b>EXG</b>			0.08532765	-0.01565023
<b>Std error</b>			0.05086054	0.06210069
<b>t-stat</b>			*1.67768	(NS)-0.25201
<b>RIT</b>	0.07101197	-0.06792313	0.04874085	-0.11011448
<b>Std error</b>	0.08699968	0.09209261	0.07865307	0.08982126
<b>t-stat</b>	(NS)0.81623	(NS)-0.73755	(NS)0.61969	(NS)-1.22593
<b>Number of Observations</b>	85	85	85	85
<b>Degree Of Freedom</b>	79	79	78	78
<b>F-Statistics</b>	28.0432	37.4312	30.0809	31.7590
<b>P-value of F</b>	0.000000	0.000000	0.000000	0.000000
<b>R-Squared</b>	0.639625	0.703182	0.698242	0.709555
<b>Adjusted R-Squared</b>	0.616816	0.684396	0.675030	0.687214

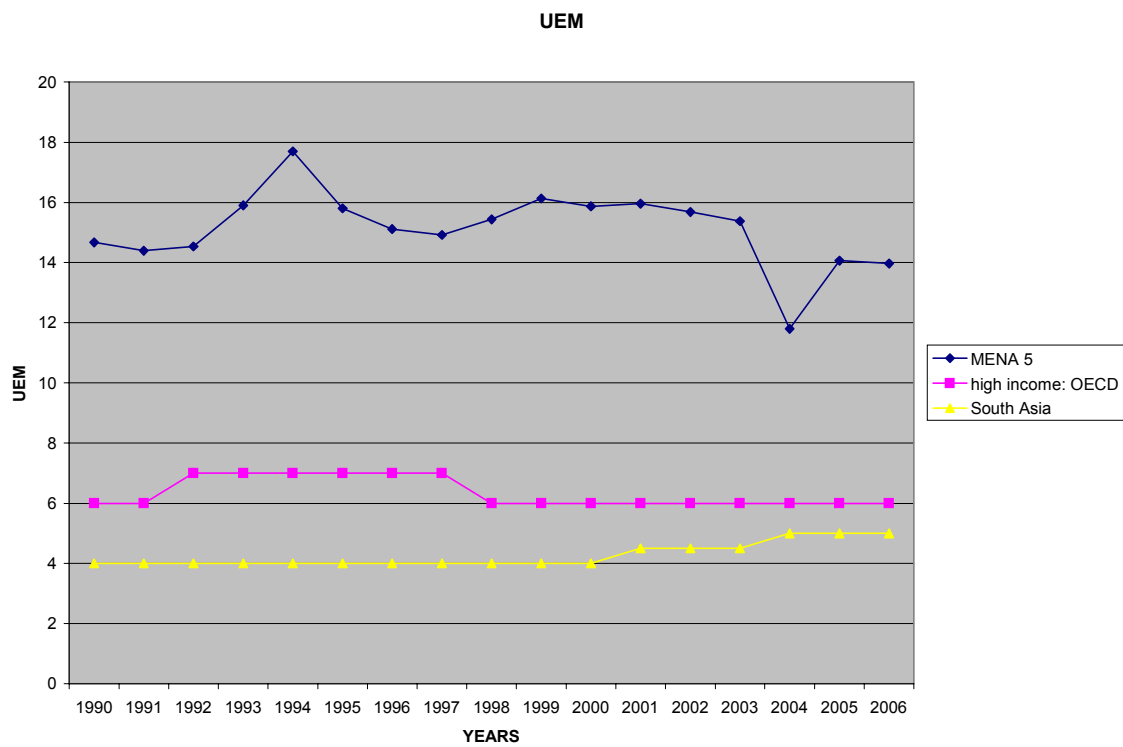
**Table (6D)**  
**Testing Growth Sustainability, Second Stage in Log (with ROL & RDP)**

Independent Variables	Dependent Variables Log(UET)	Dependent Variables Log(UEM)	Dependent Variables log(UET)	Dependent Variables log(UEM)
<b>Constant</b>	6.812876016	7.466007899	5.759148840	6.145984976
<b>Std error</b>	0.395785569	0.497503537	0.317022077	0.426034133
<b>t-stat</b>	***17.21355	***15.00694	***18.16640	***14.42604
<b>GROF</b>	-1.961183321	-2.311266575	-1.416712144	-1.657528933
<b>Std error</b>	0.200725939	0.252633017	0.172146842	0.230956728
<b>t-stat</b>	***-9.77045	***-9.14871	***-8.22967	***-7.17679
<b>GROS</b>	0.220720325	0.259464941	0.154352426	0.183174169
<b>Std error</b>	0.023926573	0.030181613	0.021897103	0.029375757
<b>t-stat</b>	***9.22490	***8.59679	***7.04899	***6.23556
<b>SETF</b>	-0.012768285		-0.008470365	
<b>Std error</b>	0.002274587		0.002105669	
<b>t-stat</b>	***-5.61345		***-4.02265	
<b>SEBF</b>		-0.023072846		-0.017711398
<b>Std error</b>		0.002883218		0.002918411
<b>t-stat</b>		-8.00246		***-6.06885
<b>LET</b>	0.081262588		0.057214976	
<b>Std error</b>	0.014302710		0.017001864	
<b>t-stat</b>	***5.68162		***3.36522	
<b>LEM</b>		0.130398171		0.120434856
<b>Std error</b>		0.018255921		0.023775342
<b>t-stat</b>		***7.14279		***5.06554
<b>EXG</b>			0.007216200	0.004003474
<b>Std error</b>			0.003136581	0.004501878
<b>t-stat</b>			**2.30066	(NS)0.88929
<b>RIT</b>	0.003059069	-0.004251309	0.001893973	-0.006782188
<b>Std error</b>	0.005214031	0.006560466	0.004850553	0.006511431
<b>t-stat</b>	(NS)0.58670	(NS)-0.64802	(NS)0.39047	(NS)-1.04158
<b>Number of Observations</b>	85	85	85	85
<b>Degree Of Freedom</b>	79	79	78	78
<b>F-Statistics</b>	28.9568	42.8131	28.5339	34.5919
<b>P-value of F</b>	0.000000	0.000000	0.000000	0.000000
<b>R-Squared</b>	0.646981	0.730435	0.687002	0.726844
<b>Adjusted R-Squared</b>	0.624638	0.713374	0.662926	0.705833

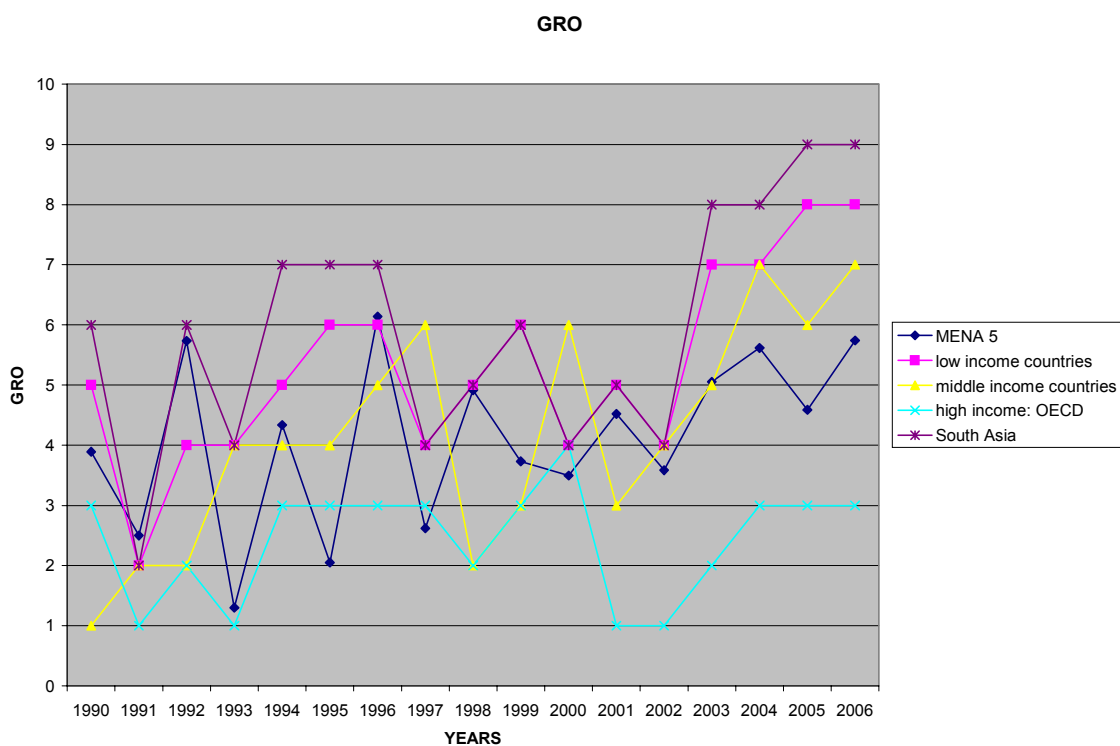
**Figure 1: Unemployment Rate (UET)**



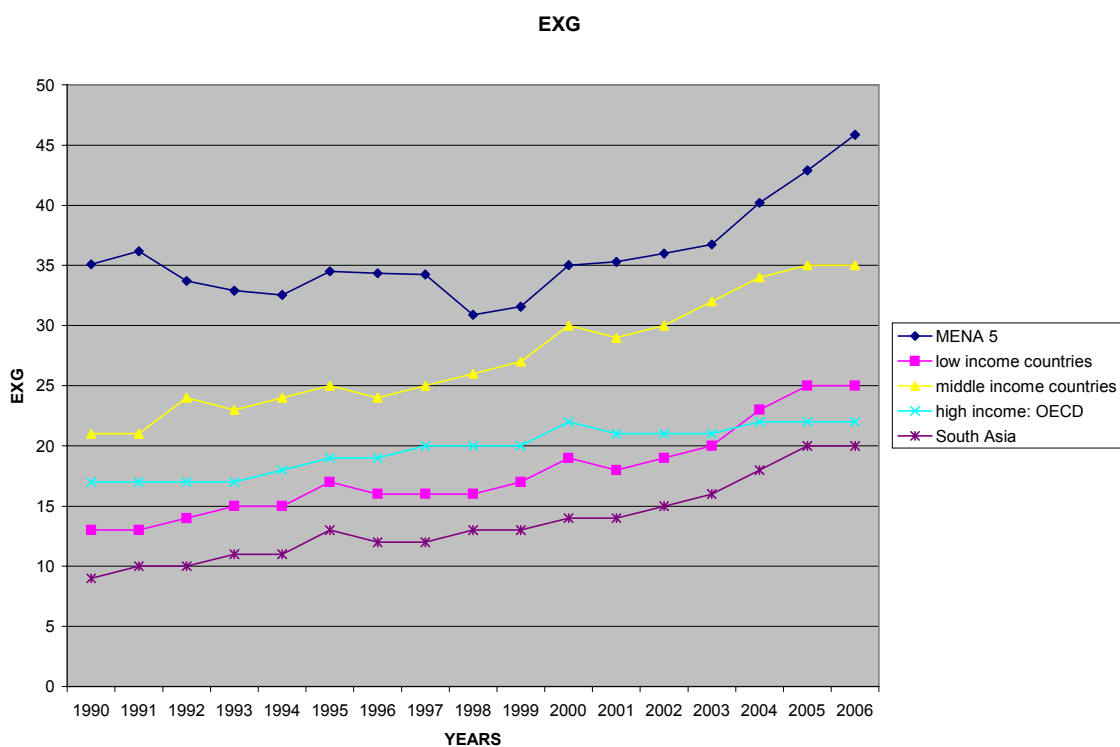
**Figure 2: Male Unemployment (UEM)**



**Figure 3: GDP Growth Rate (GRO)**

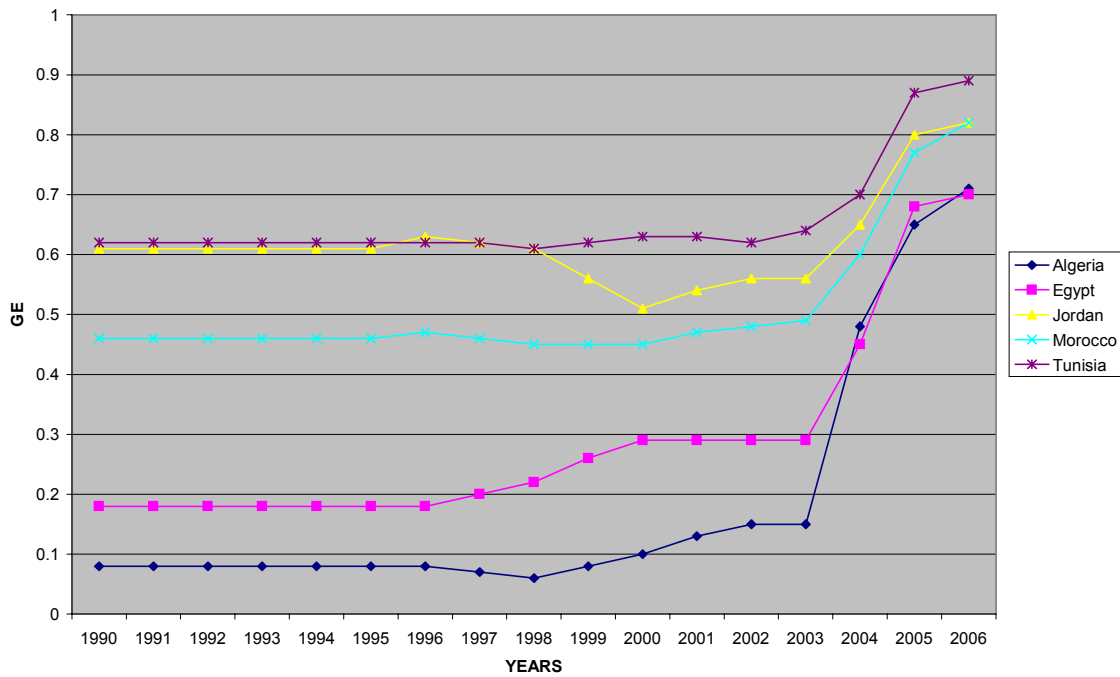


**Figure 4: Export Share of GDP (EXG)**



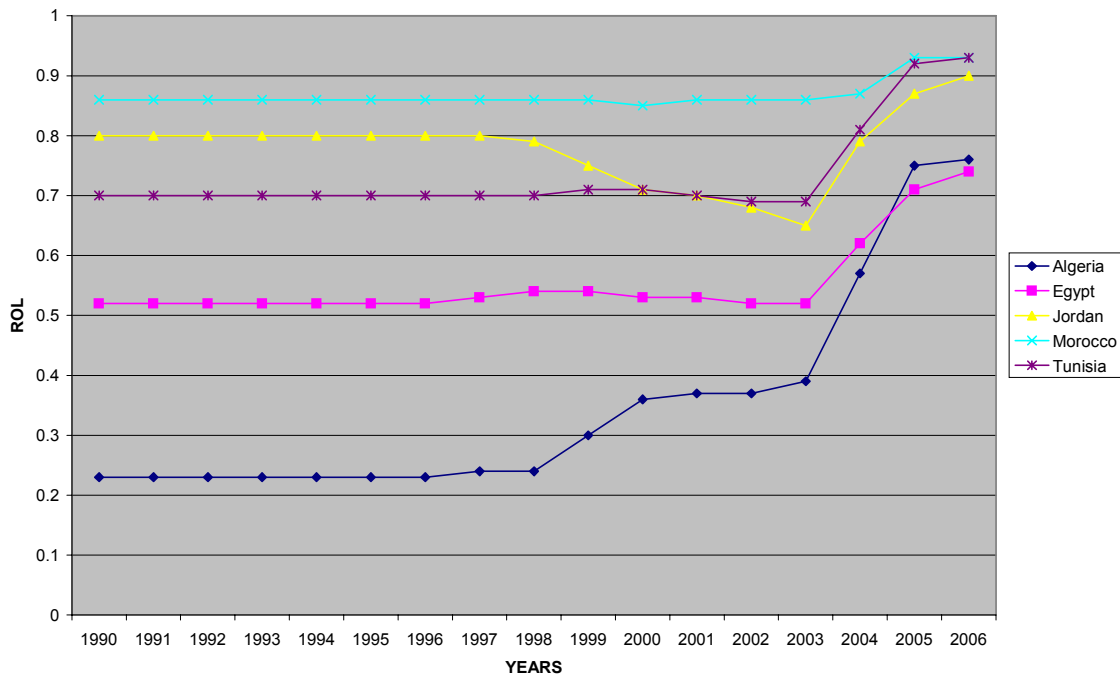
**Figure 5: Governance Effectiveness (GVE)**

GE FOR MENA 5

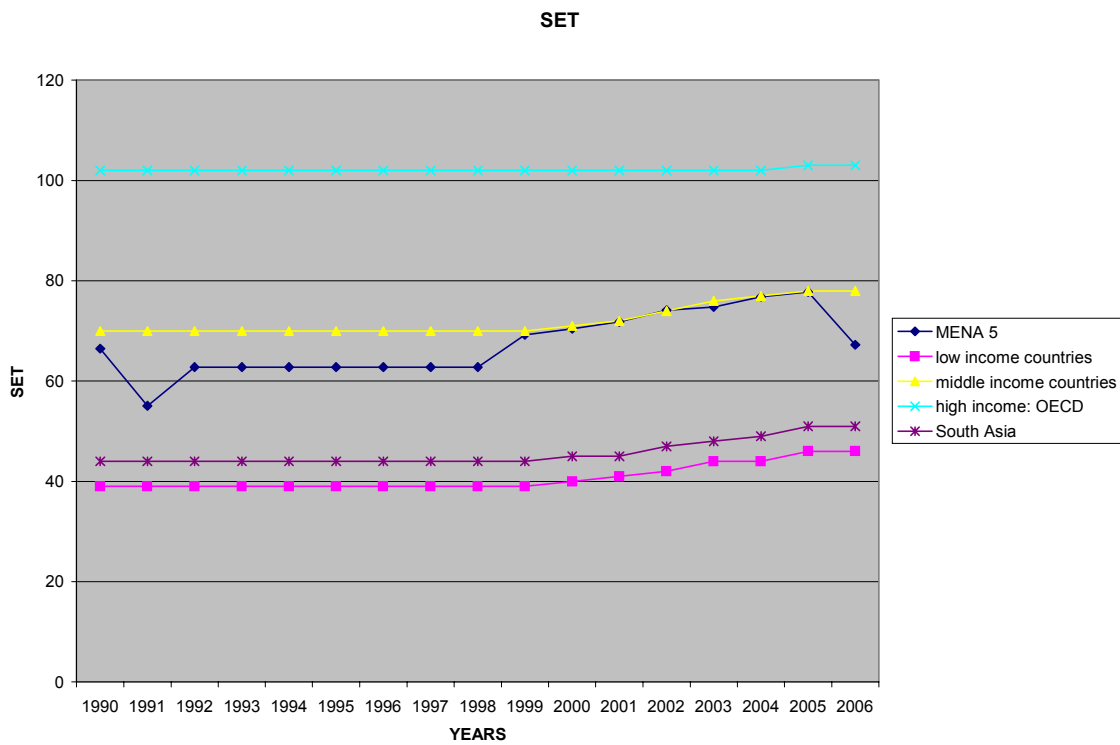


**Figure 6: Rule of Law (ROL)**

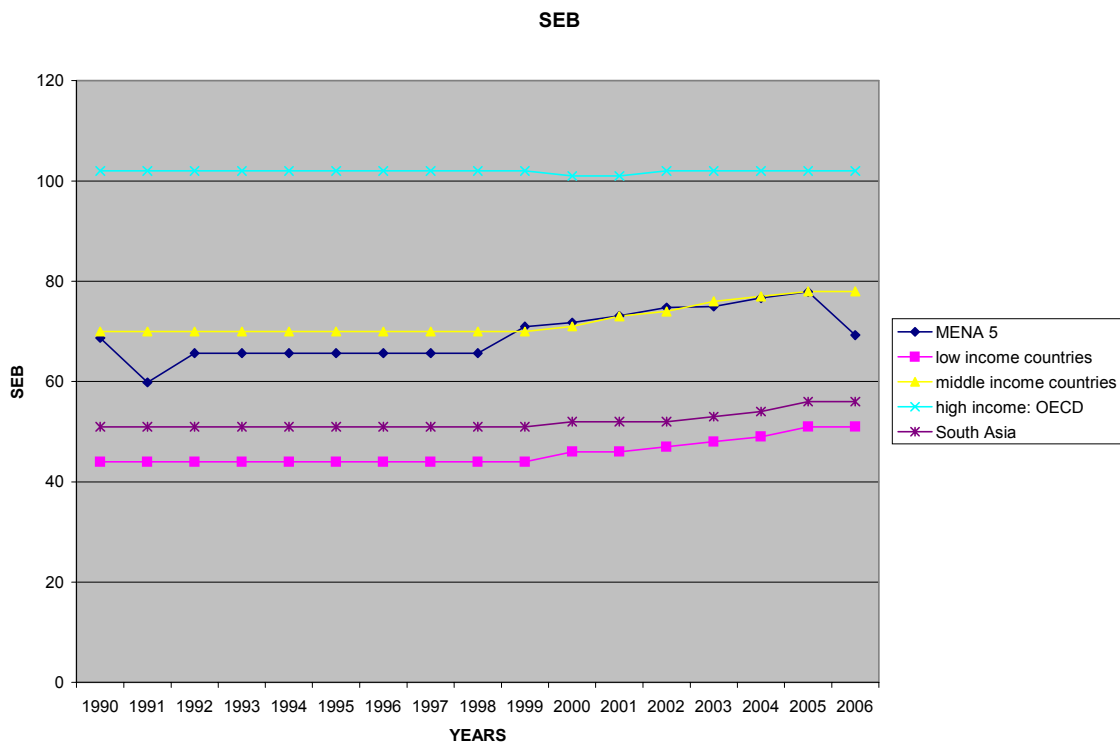
ROL FOR MENA 5



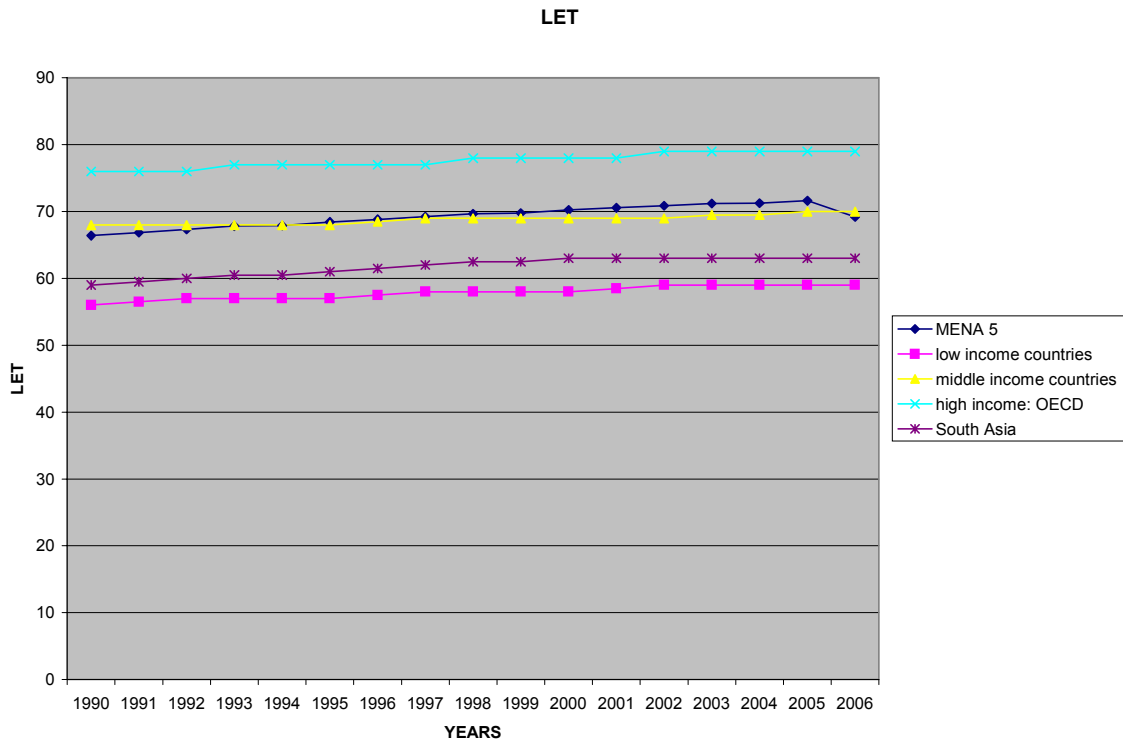
**Figure 7: Gross Secondary Enrolment Rate (SET)**



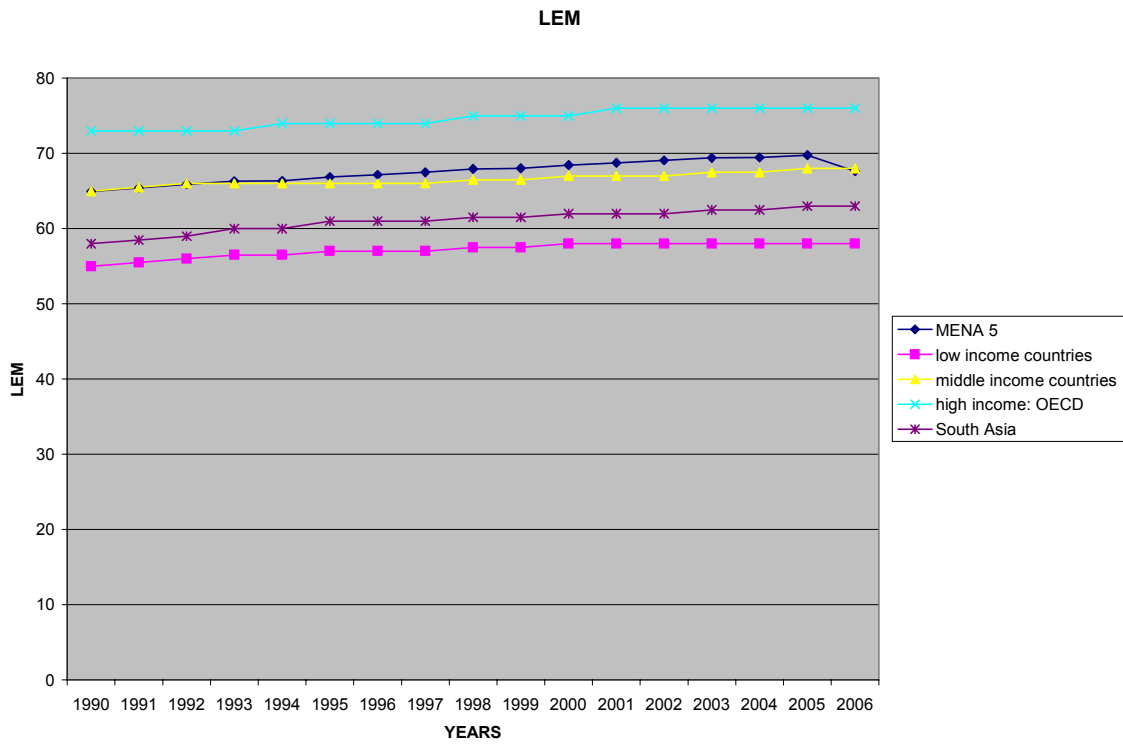
**Figure 8: Gross Secondary Enrolment Rate, Boys, (SEB)**



**Figure 9: Total Life Expectancy (LET)**



**Figure 10: Male Life Expectancy (LEM)**



**Figure 11: Percentage of Road Pavement (RDP)**

