Understanding Unemployment in the Arab Countries: Towards A Policy Framework

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Abstract

The paper uses a sample of five Arab countries (namely Algeria, Egypt, Jordan, Morocco and Tunisia) in a dataset covering 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 a second-stage estimation of unemployment behaviour in the general population and separately for men. Results suggest that while growth, by itself, does tend to achieve significant reduction in unemployment, the lack of sustainability of growth works in the opposite direction raising unemployment so that the net effect is rather modest. Moreover, 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. Rising longevity appears to predict rising unemployment via participation which would call for faster job creation in order to meet the growing aspirations of the public.

نحو إطار للسياسات لفهم البطالة في الدول العربية

سيد أحسن
زينج فاي ليو

ملخص

استهدفت الورقة تطوير نموذج لسلوك معدل البطالة في خمس دول عربية هي الجزائر، الأردن، تونس، مصر والمغرب خلال الفترة 1990 – 2006. تم الاعتماد في بناء هذا النموذج على قواعد بيانات البنك الدولي ومنظمة العمل الدولية، واستند على خمس أطروحات نمطية حول علاقة البطالة بكل من: معدل نمو الناتج المحلي الإجمالي، ورأس المال البشري، والمشاركة في قوة العمل وخدمات رأس المال والعولمة والاندماج في الاقتصاد الدولي. وفي ما يتعلق بالنتائج التطبيقية التي تم رصدها في هذه الورقة تبين أن زيادة معدل النمو الاقتصادي بنقطة مئوية يؤدي إلى انخفاض معدل البطالة بحوالي 3.2%، وأن ارتفاع العمر المتوقع لدى الولادة بحوالي 2.7 سنة يؤدي إلى ارتفاع معدل البطالة بحوالي 3.7% كما توضح النتائج أن التذبذب في النمو الاقتصادي من شأنه زيادة معدل البطالة.

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Introduction

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 among the pressing social and economic concerns anywhere and particularly so in the Middle East and North Africa (MENA) region where its level has been historically high. Sen (1999) stresses the psychological and other harmful effects (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 unemployment and poverty outcomes, it is generally observed that even countries with 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. 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. In this context, it would be interesting to formally explore the likely impact of the sustainability of growth on unemployment.

Literature on human capital points out that the contribution of human capital ought to be 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 Véganzonès-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 if the recent pick up in the growth rate

in most countries of the region is undeniable (Ali, 2002, and Ali and Elbadawi, 2002).

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 in earlier decades. This is, however, expected to moderate in the years to come, but still remains high. Moreover, the participation level has remained modest by global, particularly developing country standards.

In recent years, advances in female educational attainment have also spelled 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.

This paper cannot reasonably be expected 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 objective is to specify 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 focus will be in developing an a-priori model of unemployment behaviour.

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:

- Unemployment: 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.
- 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. 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.
- Participation: It may be observed 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 interesting to capture these details in an estimated model. In any case, how should a researcher capture the participation variable in the analytic model?

- 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.
- Globalization and Economic Integration: In many of the literature on modern growth and development, economic integration features prominently (e.g., Sachs and Warner, 1995). Hence, a measure of this variable as a possible explanation of employment generation has to be searched. Empirically, however, a 2-stage estimation procedure as proposed 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 whether 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

$$U = LF - E \tag{1}$$

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, the 'unemployment rate' is obtained which is convenient since most data are typically expressed in terms of the rate:

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

or:

$$UET = f(EMT/LPT) \tag{2b}$$

where UET is used to denote the 'total unemployment rate'. Equation 2b follows from Equation 2a simply by dividing the numerator and the denominator on the right-hand side (rhs) by the economically active population variable (P). UET

is obtained as determined by the ratio of the 'employment rate' (EMT) to the 'labour force participation rate' (LPT). For estimation purposes, however, it may be linearized, written as:

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

Alternatively, it may be noted that Equation 2a is linear in log. Hence, it may also be written:

$$\log UET = g_0 - g_1 \log EMT + g_2 \log LPT + error, \qquad g_1, g_2 > 0 \qquad (3b)$$

The sign pattern of the coefficients in Equations 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. In the absence of data on real wage growth or on labour productivity, GDP growth (GRO) is used as a proxy as follows:

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

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, delayed retirement (i.e., staying 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 be likely 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.

Employment Rate (EMT). The next task is to capture the demand side of the market, namely the evolution of the employment rate. Essentially, factors that affect the marginal productivity of labour need to be included, and hence the labour input may be interpreted to have been measured in 'efficiency units'. Following the neoclassical production function idea, this variable must reflect 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, an integration variable is included, typically measured by 'export to GDP ratio' (EXG), as several empirical studies have stressed its impact on job creation especially in East and South East Asia.

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

where it is proposed to use GDP growth as a proxy for TPF 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, the employment demand function may be restated as follows:

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

In view of both supply and demand sides of the market, Equations 4a and 4c in Equations 3a and 3b may be substituted to obtain a reduced-form equation that retains the essential structure of the causal relationships reviewed above:

$$UET = \alpha_0 + \alpha_1\, GRO + \alpha_2\, HUM + \alpha_3\, RIT + \alpha_4 EXG + \alpha_5\, LET + \alpha_6 MRT + \varepsilon_{1,}$$
$$\alpha_1 ?, \alpha_2 ?, \alpha_3 > 0, \alpha_4 < 0, \alpha_5 > 0, \alpha_6 < 0 \quad (5a)$$

Alternatively, in log form:

$$\log UET = \beta_0 + \beta_1 \log GRO + \beta_2 \log HUM + \beta_3 \log RIT + \beta_4 \log EXG + \beta_5 \log LET + \beta_6 \log MRT + \varepsilon_{2,}\ \beta_1 ?, \beta_2 ?, \beta_3 > 0, \beta_4 < 0, \beta_5 > 0, \beta_6 < 0 \quad (5b)$$

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 rhs of Equations 5a and 5b. The latter coefficient would be expected to be positive, namely higher volatility leads to higher unemployment according to the hypothesis postulated.(1) It is intuitive that if growth is perceived to be unreliable, employers would hold off hiring till the outlook becomes more stable, especially when market rigidities make firing of workers difficult to accomplish.

Given the sign pattern of Equations 3a and 3b, the RIT and LET variables are expected 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.

Gender. An important element of this research would be to discern the implications for both male and female unemployment policies. Hence Equations 5a and 5b would be estimated 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 drawing 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, there are no data on female unemployment on a consistent basis for all countries in the sample analyzed. On the rest of the variables, there is however, a much larger latitude of debate, albeit 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, it is proposed to measure human capital by the 'secondary school enrolment rate' (SET). For the male unemployment equation, boy's enrolment figures (SEB) are used.

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, the real interest (RIT) variable compiled by World Development Indicators (World Bank, 2007b) is used which is a weighted average of real commercial lending rates.

Instrumental Variable Approach

GDP Growth (GRO). Since several rhs variables (e.g., unemployment, GRO human capital) may well be determined endogenously, it is important to take this into account. Hence, there is a need to look for instruments for GRO and human capital variables.

On the issue of a suitable instrument for GRO, Rodrik et al. (2004) have convincingly argued that the quality of institutions (à la New Institutional Economics, e.g., see North, 1990 and Williamson, 1979) is the primary determinant of long run growth.(2)

Focusing on the indicators from the World Bank Governance project available since 1996, 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, these two are used as alternative instruments for the growth variable. One component of these indices on which data is available on a consistent basis for all data points starting 1996, is used in the present study.(3)

For secondary enrolment, the instrumental variable proposed is the 'percent of paved roads' (RDP) on which consistent data are 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.

The following is proposed to estimate the two first-stage equations for GRO and HUM:

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

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

where general 'life expectancy among men' is denoted by LEM as distinct from that in the general population, LET. The a priori sign-pattern of the estimated coefficients of these equations is discussed when the data are described.

The second stage estimation of Equations 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 a measure of relative dispersion as discussed above.

Data Construction

The paper's objective is to assemble a data set for the larger and more economically diversified countries from the MENA region, keeping in mind the structural differences in the nature of the challenges between those which are major exporters of oil and the rest. The data set should also be of a panel type that may be analyzed for both changes over time and in the cross-section. These stipulations suggest focusing on the fairly recent period of 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.

However, the availability issue dictated narrowing the dataset to the five countries of Algeria Egypt, Jordan, Morocco and Tunisia, herein referred to as MENA_5. Of the entire MENA region, these five countries account for nearly half of the region's population at precisely 46%, 45% of the working-age population and 43% of the labour force (ILO, 2005). Indeed, the three relatively large countries included in this sample - Egypt, Morocco and Tunisia - account for 41% of MENA's entire working-age population.(4)

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.(5)

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 are missing in the former which are taken from the ILO website (http://laborsta.ilo.org), but are mutually consistent in most cases. When faced with the problem of missing observations, averaging procedure was followed to fill in these points.(6) For Jordan, the unemployment data are exclusively drawn from WDI.(7)

Governance Data. As already stated, the data about institutional variables of GVE and ROL were processed by Global Risk Service (GRS)/Global Insight, and which forms a component of the index that Kaufmann et al (2007) has derived for these indicators. The GRS data are 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 1990-1995 period, which pre-dates this survey, the 1996 values were used as proxy.

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 (op cit.). As before, where there are missing observations, the averaging procedure was followed. For the RIT variable, the year-by-year four-country sample average was used to construct a series for Tunisia where no data were available from the sources noted above.

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

Descriptive Properties of the Dataset and Related Literature

Labour Market Developments

The labour market dynamics in the region is rich in contrasts 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% as of 2005, it lags behind all other developing regions including South Asia. The total participation rates, albeit 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% in 1990 to 22% in 2005, resulting in a decline in overall participation rate from 52 to 49% 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, since 2000 has 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.(8) However, this is 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% in 2000, but has been on an uptrend. However in Egypt and Morocco, the additions to the labour force in 2000-2005 have been at their current rates, hence stagnation. On the other hand, female share of labour force has grown robustly both in Algeria and Tunisia since 2000.

Unemployment Rate. This has decreased in recent years for most MENA countries where comparable data exist.(9) 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% in 2005 (from 14.3% in 2000), in terms of the MENA_5, none has 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%), 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 (World Bank, 2007a , Box 2, p44).

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 four times higher than for men. In Tunisia, there has been a sizeable decline in unemployment for men (from 15.3 to 13.1%); but in contrast, the female rate has gone up from 15.9 to 17.2%. 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 (World Bank, 2007a).

The pooled sample for MENA_5 for the period 1990-2006, presents a comparable picture (Figures 1 and 2). Not unexpectedly, Egypt turns out as having the lowest average level of total unemployment over this period at about 10% and without much fluctuation. The Tunisian figures are fairly flat at the 15% level, while for Morocco, some fluctuations are observed, ranging from 15.8% in 1990 to 9.7% in 2006. Jordanian figures have fluctuated between 27.5% in the early 1990s to 12.4% in 2004. Algerian unemployment rates which stood at about 21% (both male and female) as of 1991 rose to 28.7% of the labour force as a whole (and 26.9% for males) by 1997, and hence, much higher rates for females. Thereafter, it has fallen gradually (to the 20-21% range by ILO-WB estimates), but national estimates suggest much lower rates, especially for females as already noted. Overall, the male figures are consistently and significantly below the total, implying a much higher rate for females, except as otherwise noted. The sample as a whole, exhibits a high degree of volatility with the standard deviation being 5.5 and 6.4, respectively, for UET and UEM (while the means are 16.4 and 15.1%).[(10)]

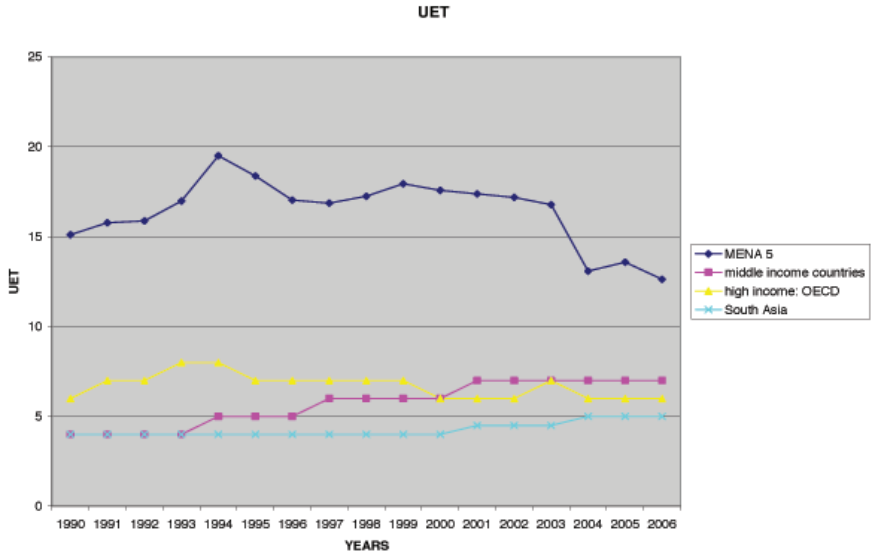

Figure 1. Unemployment rate (UET).

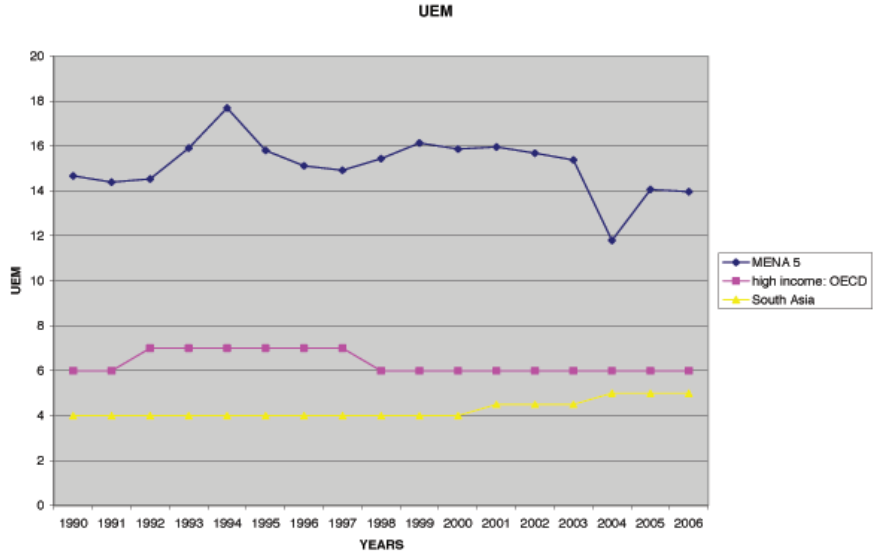

Figure 2. Male unemployment (UEM).

GDP Growth. GDP growth for the entire MENA region (excluding Iraq and Turkey) since the mid-1990s has been 4.63%, 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 at 5.3 and 4.9%, respectively. The average rate over 1990-2006 has been 4.1% for the sample, 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 five years (Figure 3).

To examine the sample more closely, Algeria's real growth started from 1% in 1990 rising to 3% in 2006 with fluctuations in between, and with negative rates (in the 1-2% range) in the early 1990s. Egypt has grown much faster starting off with a figure of 6% in 1990 and registering 6.9% in 2006 but growth has faltered during 2000-2005, where the six-year average is a mere 4.0% annually. Jordan's growth was highly volatile in the early 1990s (although never in the negative), but has since stabilized. The average growth since 2000 is well above the regional average. Morocco's figures are low to begin with (in the 4.0% range in 1990), but rose to 7.3% in 2006. However, growth had been frequently negative in the 1990s (e.g., negative 6.6 and 2.2%, respectively, in 1995 and 1997). GDP growth in Tunisia started from 8% in 1990 and fell to 5.2% 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.

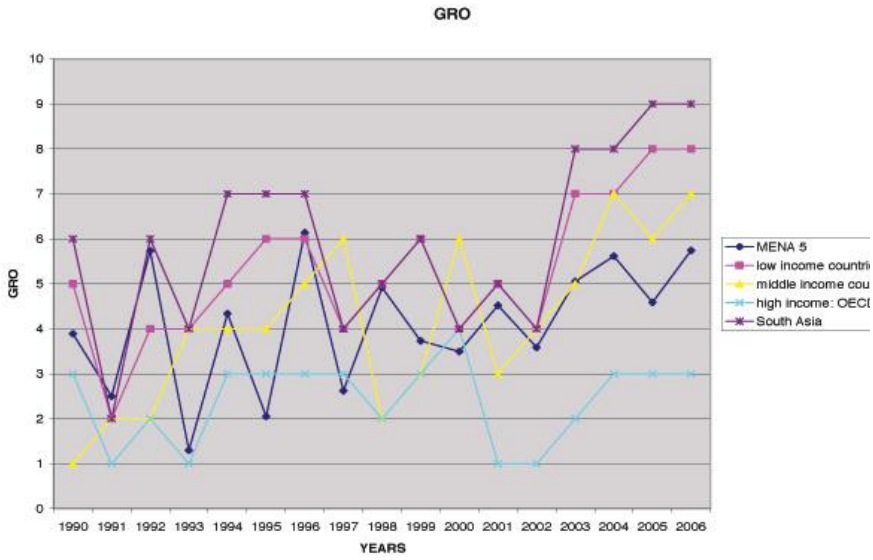

Figure 3. GDP growth rate (GRO).

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 averages of these variables are slightly below the global mean, the sample five countries produce results that are in the second quartile of the global distribution (Figures 4 and 5). 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 (Kaufmann, 2006).

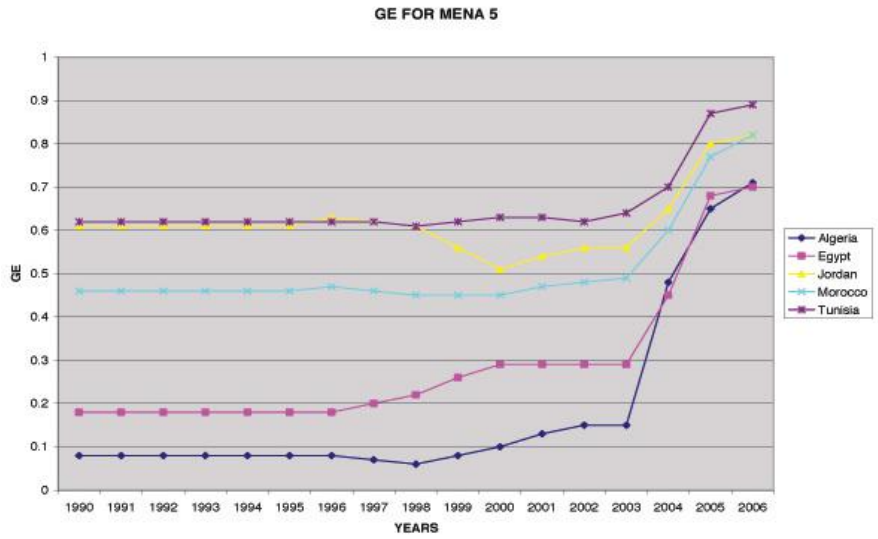

Figure 4. Governance effectiveness (GVE).

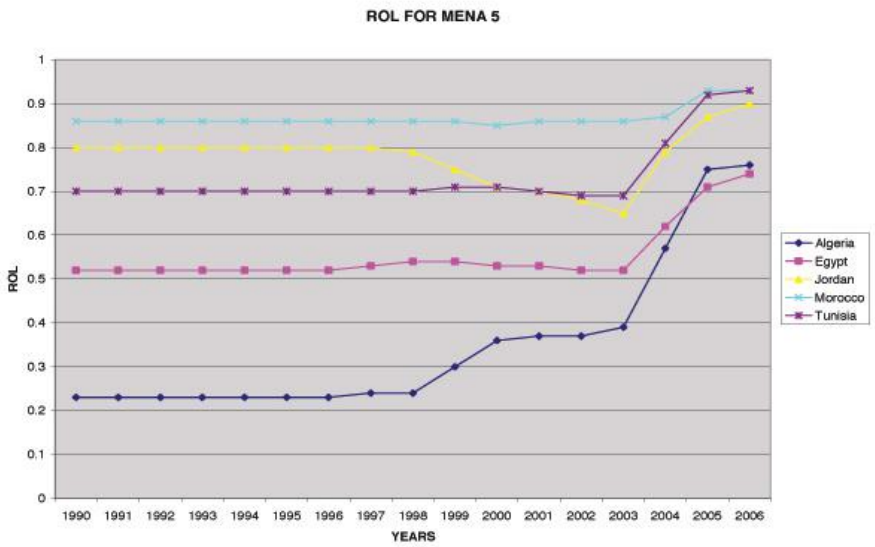

Figure 5. Rule of law (ROL).

Human Capital. The MENA educational standards have improved significantly in the last 20 years or so (see Figures 6 and 7 for a regional comparison). Barro and Lee (2000) analyzed 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 study, indicates that Egypt and Jordan enjoy the highest level of this indicator throughout the time period. It rose from about 70-75% in the early 1990s to the 85% range 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% in 1990 and rose to 83% in 2006, a sharper pattern, while Tunisia started from an even lower figure of 45% in 1990 to reach 79% in 2000, which records the fastest pace in the sample. Morocco, by contrast, remains out of league where the figure started from 35% in 1990 to reach only 50% 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 (Appendix Table A2).[11]

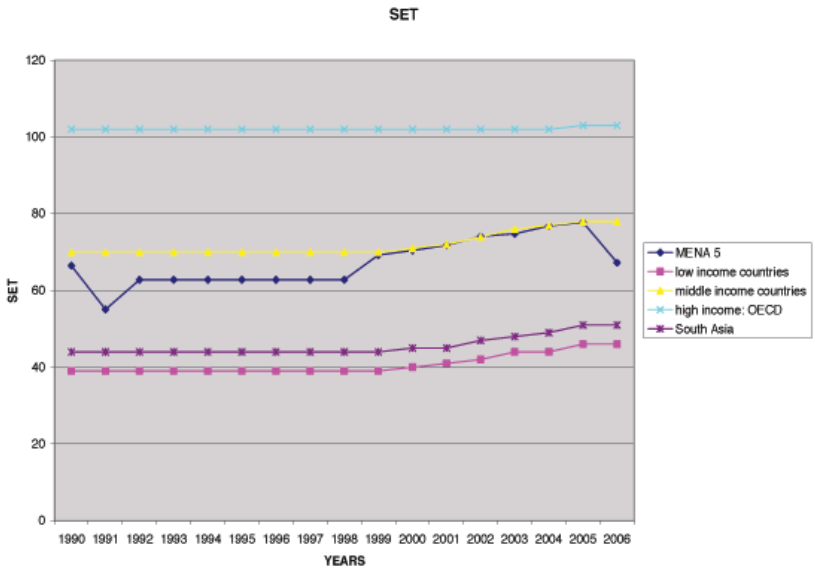

Figure 6. Gross secondary enrolment rate (SET).

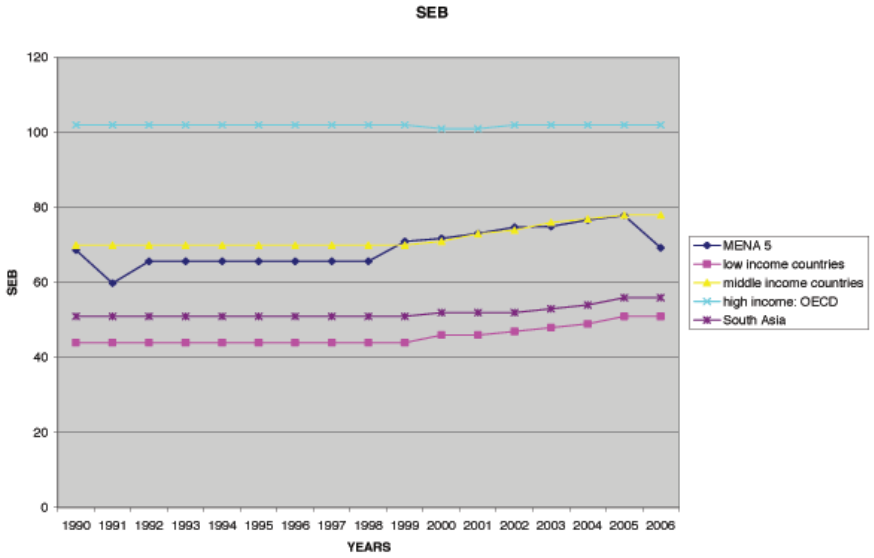

Figure 7. Gross secondary enrolment rate, boys, (SEB).

It has been noted earlier that rising educational attainment, especially for 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, for Egypt on which adequate data exist, it is seen that at the secondary education level, female unemployment rate fell from 47.7% in 2000 to 33.8% in 2006. However at the higher education level, the opposite pattern indeed is in evidence (20.2 vs. 24.8%, respectively between 2000 and 2006).[12] 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 (Figure 8). What is remarkable however is that even the oil importing nations within it exported in excess of one-third of their GDP as of 2006, with a good proportion destined for EU. The export share has been far

in excess of that in South Asia (in the low teens till the new millennium), or for that matter, the LAC region (about 28%). Given this background, the sample countries, on average, enjoy higher exports to GDP ratio vis-à-vis the average for MENA oil importers as well as that for all developing countries taken together.

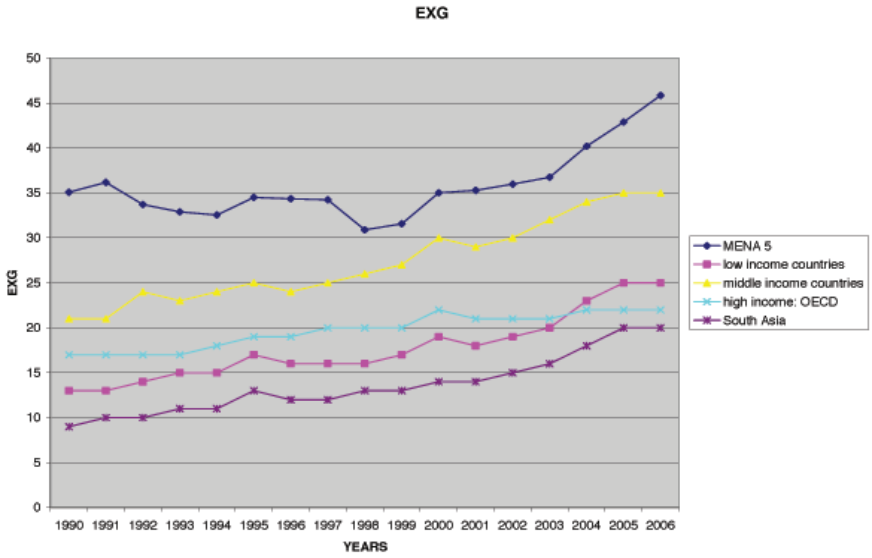

Figure 8. Export share of GDP (EXG).

The annual pattern, as elsewhere in MENA, has been on an uptrend, albeit exhibiting some fluctuations (Appendix Table A2). Jordan is the leader in this category where the ratio had fluctuated between 62% in 1990 to figures in the 40% range in late 1990s before stabilizing at the 50% level in recent years. Egypt's figures range from 20% in 1990, falling to 15% in 1999 but then it reached 31% in 2006, while Morocco's level has been very stable, ranging from 27% (1990) to 37% (2006). Tunisia is the other major exporter among the resource-poor group. Its ratio stood at 43% in 1990 and rose to 55% in 2006 with minimal fluctuations along the path. These figures are 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 53% in 2006. It would be of interest to examine if the export ratio affects unemployment via growth or independently.

Life expectancy (LET). The 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 73.5 (Appendix Table A2). 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. Figures 9 and 10 present a regional comparison of life expectancy, both general (LET) as well as that for males (LEM), respectively.

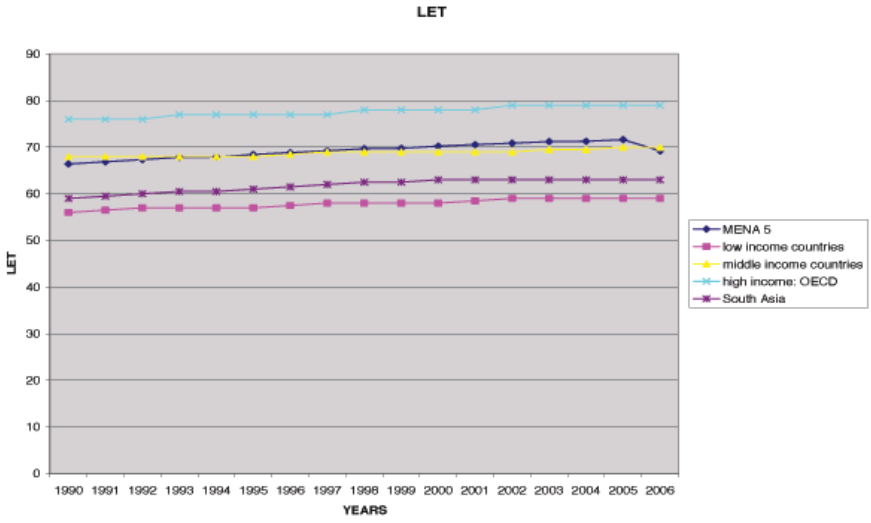

Figure 9. Total life expectancy (LET).

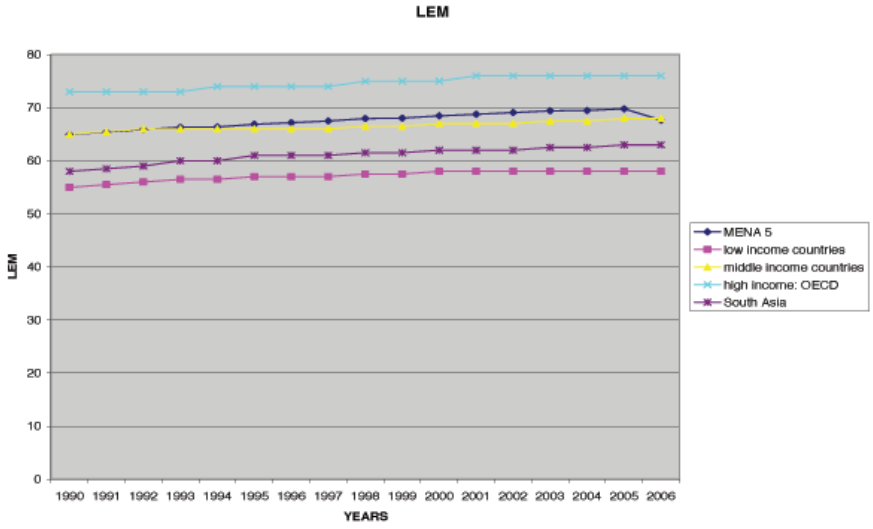

Figure 10. Male life expectancy (LEM).

Mortality Rate (MRT). Most countries in the region have relatively low mortality rates vis-à-vis other developing regions, although for this indicator, there is quite a bit of dispersion in the data. The Algerian figures generally lie between 5 and 6% except for the blip to 18% in 1997. Egypt's mortality rates declined significantly from 13% in 1990 to 4% in 2003 except recording 18% in 1995. Morocco also shows good progress on this front where it dropped from 8% in 1990 to 5% in 2002 and continued to drop, while Jordan and Tunisia stay at the top of the heap with low and stable figures rather close to the Organization for Economic Cooperation and Development (OECD) level (World Bank, 2007b).

Paved Roads (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 (Figure 11). Jordan is right on top with 100% of its roads duly paved thus meeting or even exceeding the standard in high-income OECD countries. Morocco at the other extreme, has roughly 53% of its roads paved by 2005, while Algeria, Egypt and Tunisia stay in the 70% range. 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 (Appendix Table A2).

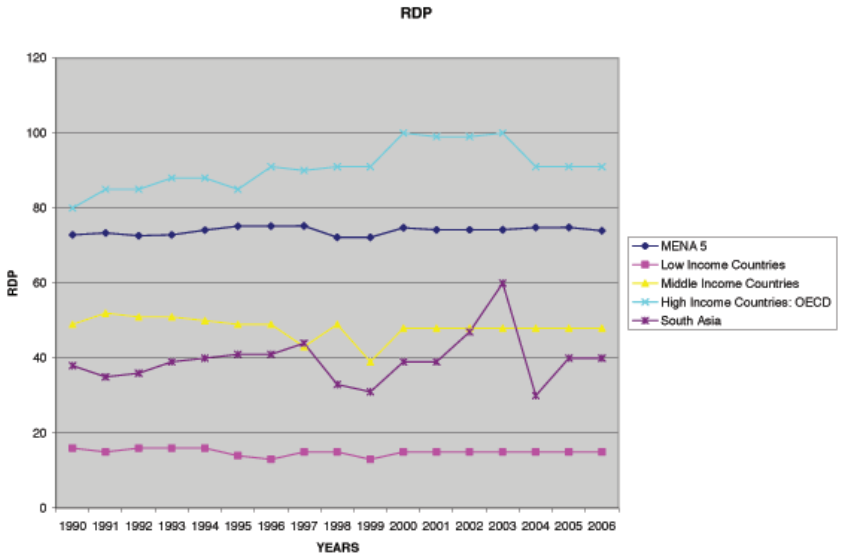

Figure 11. Percentage of paved roads (RDP).

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 rhs 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 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), a full logarithmic version of the basic model is not estimated (e.g., Equation 5b and similar ones for UEM). Instead, these are estimated in the semi-logarithmic form, i.e., where the left-hand side (lhs) variables are entered as logarithms.

The Correlation Matrix

An initial examination of the correlation pattern among variables reveals that under-5 mortality (MRT) is fairly closely and negatively correlated with LET/LEM in the 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. Hence, MRT is excluded from any further consideration to avoid a potential source of multicollinearity.

The correlation chart (Table 1) indicates that growth (GRO) and human capital (SET/SEB), each appears 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. 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.

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

Validity of Instruments. Insofar as the instrumental variables are concerned, both GVE and ROL are positively correlated with GRO, although 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 (not reported here), it is further confirmed that while GVE is significant in explaining GDP growth at the one-percent level, ROL attains significance at the five-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, briefly outlined are the simple OLS results to put the results in proper perspective. Table 2 reports the OLS estimates where the unemployment variables have been treated in 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 SET/SEB and RIT each improve the unemployment situation. However, while the coefficient of GRO indicates a negative association with unemployment, the estimate 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. It is to be noted that while the SET/SEB variables are highly significant in each equation, the coefficient for

male unemployment is double that for general unemployment, implying very low relative impact of schooling on female unemployment. It would be of interest to re-examine if any of these predictions may survive in the 2-stage procedure.

Table 2. OLS in Log with Data Not Normalized

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

N.B. Unless otherwise stated, notations for statistical significance of the estimated coefficients are identified as follows in all tables:

***: significant at the 1 percent level
**: significant at the 5 percent level
*: significant at the 10 percent level

First-Stage Equations

The two first-stage equations as specified by Equations 6 and 7 are estimated with instruments for the growth and human capital variables. It may be recalled that while RDP is the sole instrument for SET/SEB variables, there are two alternative candidates - GVE, and ROL - for the growth equation. The four sets of results are presented in Tables 3a - 3d.

Table 3a. First-Stage with GVE and RDP as Instruments

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

Table 3b. First-Stage with GVE and RDP as Instruments (without EXG)

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

Table 3c. First-Stage with ROL and RDP as Instruments

Independent Variables	Dependent Variable	Dependent Variable	Dependent Variable
	GRO	SET	SEB
Constant	-3.445769208	-48.54113238	-45.90431729
Std error	2.968475802	6.46286039	6.08624277
t-stat	-1.16079	-7.51078***	-7.54231***
ROL	4.723617904	-20.19438884	-20.39055206
Std error	2.392504123	5.20887525	5.08389524
t-stat	1.97434*	-3.87692***	-4.01081***
RDP	0.060866069	0.86211595	0.82495036
Std error	0.028703196	0.06249158	0.05780587
t-stat	2.12053**	13.79571***	14.27105***
EXG	-0.060001870	-0.30875147	-0.37254098
Std error	0.063498078	0.13824577	0.14072881
t-stat	-0.94494	-2.23335**	-2.64723***
LET	0.292206946	0.48291166	
Std error	0.302769026	0.65917800	
t-stat	0.96512	0.73260	
LEM			-0.32607529
Std error			0.66591378
t-stat			-0.48967
RIT	-0.009150096	-0.35825149	-0.31379235
Std error	0.079331464	0.17271765	0.16243225
t-stat	-0.11534	-2.07420**	-1.93184*
Number of Observations	85	85	85
Degree Of Freedom	79	79	79
F-Statistics	1.9812	65.2221	65.0395
P-value of F	0.09048692	0.00000000	0.000000000
R-Squared	0.111421	0.804992	0.804551
Adjusted R-Squared	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
	GRO	SET	SEB
Constant	-1.503372336	-38.54614558	-34.96579198
Std error	2.140166360	4.77741460	4.63334843
t-stat	-0.70246	-8.06841***	-7.54655***
ROL	3.407268701	-26.96792368	-28.83525649
Std error	1.943816157	4.33910927	4.10445174
t-stat	1.75288*	-6.21508***	-7.02536***
RDP	0.045274946	0.78188875	0.74790167
Std error	0.023471227	0.05239396	0.05178527
t-stat	1.92896*	14.92326***	14.44236***
LET	0.090086700	-0.55713800	
Std error	0.214138968	0.47801454	
t-stat	0.42069	-1.16553	
LEM			-1.66148049
Std error			0.45073023
t-stat			-3.68620***
RIT	0.00476819	-0.28663216	-0.25712892
Std error	0.077899905	0.17389309	0.16695225
t-stat	0.06121	-1.64832	-1.54013
Number of Observations	85	85	85
Degree Of Freedom	80	80	80
F-Statistics	2.2563	76.4689	73.9909
P-value of F	0.07027853	0.00000000	0.00000000
R-Squared	0.101377	0.792679	0.787213
Adjusted R-Squared	0.056446	0.782313	0.776574

Growth. It appears difficult to pin down the first-stage growth equation well with the instruments that have been examined, i.e. 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. Tables 3a and 3b show that even if the coefficient of GVE in the growth equation (column 2 in these tables) is slightly more robust, the F-value is higher in Table 3b than in Table 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 (Tables 3c and 3d). Comparing column 2 in Tables 3b and 3d, it may be concluded that GVE yields a better specification for the growth equation. Both the governance and the infrastructure variables turn out to be significant, albeit only at the 10% 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 45th to the 90th 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% per annum.(13) It may be noted that the GVE indicator actually varies from 0.06 to 0.89 for the entire sample. Kaufmann (2006) claims that one standard deviation increase in governance can raise per capita income by 300% in the long-run (i.e., presumably by compounding growth over a 30-year term).

The estimated coefficients of RDP variable, an excellent instrument for the human capital variable, 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 although small in magnitude.(14) In other words, one additional percentage point increase in (total) enrolment is predicted to augment long-run growth by about 5 basis points.

It has been noted by earlier writers (e.g., Barro and Lee, 2000 and Messkoub, 2006) that despite rapid growth in several of the indicators, human capital has failed to contribute significantly to growth. This study also appears to confirm such a proposition. Pissarides and Véganzonès-Varoudakis (2006) suggest that by offering a non-market wage structure (on average by 30% 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 bills tend to be higher than they need to be thereby putting burden on the revenue capacity of the state, and consequently undermining growth once more.

Human Capital Equations. The infrastructure variable, RDP, allows the enrolment equations to be well estimated 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 also be noted that GVE yields strong results.

From Tables 3b and 3d, it is seen that a one-percentage point increase in paved roads, RDP, (from the mean of 74%) is predicted to lead to almost an equal increase in the enrolment rate (between 78 and 75 basis points for boys and between 82 and 78 basis points for girls). Increased real interest rate is also seen to lower enrolment rates as the opportunity cost of staying in school rises.[15] 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% as of 2006 in contrast to about 80% in the four other countries sampled. There are also the signalling difficulties in the labour market as is often cited in the literature.

Life expectancy (LET/M). From Tables 3b and 3d, it may be noted that while the LET coefficient is inconclusive and statistically insignificant, LEM appears to negatively impact on the enrolment outcome. The coefficient is however, not very precisely estimated for the GVE specification as 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. Example is 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 may argue that the impact to LET/M is not so much via SET/B, instead directly via labour force participation.

Second-Stage Equations: Explaining Unemployment

The Overall Fit, GVE vs. ROL. The second-stage unemployment equations (both general and for males), as reported in Tables 4a through 4d, are rather well specified with high F-values. Most independent variables are highly significant with the correct a-prioi 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, Tables 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. While the quality of results is rather similar, on a pair-wise comparison of Tables 4a with 4c (or, Tables 4b with 4d), it is seen that the GVE indicator yields a dominant pattern of estimated equations than ROL. Hence, the ensuing discussion from hereon, focuses on Tables 4a and 4b.

Table 4a. Second-Stage with GVE and RDP as Instruments

Independent Variables	Dependent Variable	Dependent Variable	Dependent Variable	Dependent Variable
	UET	UEM	UET	UEM
Constant	29.30772323	29.16132707	33.46916342	31.00352871
Std error	2.22770692	2.24400496	2.08088979	2.30110386
t-stat	13.15600***	12.99522***	16.08406***	13.47333***
GROF	-3.15163478	-3.22132845	-4.19185250	-3.68103630
Std error	0.59069728	0.59573464	0.54737757	0.60246718
t-stat	-5.33545***	-5.40732***	-7.65806***	-6.10994***
SETF	0.05145124		0.03977697	
Std error	0.04430617		0.03818981	
t-stat	1.16127		1.04156	
SEBF		-0.03964579		-0.03600459
Std error		0.04686119		0.04390800
t-stat		-0.84603		-0.82000
LET	1.35075730		0.67007259	
Std error	0.31367191		0.34361129	
t-stat	4.30627***		1.95009*	
LEM		2.08560926		1.78516224
Std error		0.31525196		0.39511536
t-stat		6.61569***		4.51808***
EXG			0.22092187	0.08689971
Std error			0.05982086	0.07230267
t-stat			3.69306***	1.20189
RIT	0.00942154	-0.14472667	0.03109377	-0.13556412
Std error	0.11533721	0.11858697	0.10022794	0.11075657
t-stat	0.08169	-1.22043	0.31023	-1.22398
Number of Observations	85	85	85	85
Degree Of Freedom	80	80	79	79
F-Statistics	11.1327	20.4597	17.2202	21.0205
P-value of F	0.00000031	0.00000000	0.00000000	0.0000000
R-Squared	0.357589	0.505681	0.521505	0.570891
Adjusted R-Squared	0.325469	0.480965	0.491221	0.543732

Table 4b. Second-Stage in Log with GVE and RDP as Instruments

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

Table 4c. Second-Stage with ROL and RDP as Instruments

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

Table 4d. Second-Stage in Log with ROL and RDP as Instruments

Independent Variables	Dependent Variable	Dependent Variable	Dependent Variable	Dependent Variable
	Log(UET)	Log(UEM)	log(UET)	log(UEM)
Constant	3.286335478	3.331517248	3.639219129	3.624759880
Std error	0.146795416	0.176028479	0.127497131	0.163290770
t-stat	22.38718***	18.92601***	28.54354***	22.19819***
GROF	-0.126386859	-0.158742585	-0.217313259	-0.233797346
Std error	0.038732429	0.046469182	0.033222769	0.042290493
t-stat	-3.26308***	-3.41608***	-6.54109***	-5.52837***
SETF	-0.000889757		-0.000506331	
Std error	0.002685479		0.002259078	
t-stat	-0.33132		-0.22413	
SEBF		-0.009282850		-0.007965660
Std error		0.003312195		0.002997859
t-stat		-2.80263***		-2.65712***
LET	0.087591208		0.046572564	
Std error	0.020461348		0.021530348	
t-stat	4.28081***		2.16311**	
LEM		0.168261117		0.131209454
Std error		0.024493329		0.028842794
t-stat		6.86967***		4.54912***
EXG			0.014746111	0.011907437
Std error			0.003749368	0.005254345
t-stat			3.93296***	2.26621**
RIT	-0.004273087	-0.011606352	-0.000363477	-0.008734254
Std error	0.007380413	0.008992395	0.006153307	0.007911057
t-stat	-0.57898	-1.29069	-0.05907	-1.10406
Number of Observations	85	85	85	85
Degree Of Freedom	80	80	79	79
F-Statistics	7.2737	18.3330	15.0356	22.8005
P-value of F	0.00004769	0.00000000	0.00000000	0.0000000
R-Squared	0.266694	0.478257	0.487605	0.590679
Adjusted R-Squared	0.230029	0.452170	0.455175	0.564773

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.

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%.(16) 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 indicating 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.

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 at 4.3 and 6.6, respectively. A one-standard deviation - 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%. This is rather large. The predicted magnitude is even higher for males. As previously discussed, 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. Therefore, the growth and employment strategies have to adequately deal with not only the impact of population growth on participation, but also on labour force growth via longer life expectancy.

Human Capital. Generally speaking, the human capital variables, in spite of these being well specified in the first-stage estimation, do not appear to

materially influence the unemployment outcome (columns 2 and 3 in Tables 4a and 4b). However, the logarithmic specification (Table 4b) shows that increased secondary education by boys does indeed alleviate male unemployment. 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.(17) 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 have been absorbed traditionally in public employment which has been drying up of late, consequently slowing down overall job growth for women.

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 on this issue. However, it is to be noted 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.(18)

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 data set, 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.

Cost of Capital (RIT). It was seen in the first stage that although increased real interest rate lowered the enrolment figures, the direct impact on growth is negligible. The second-stage equations reveal that the impact on unemployment is also statistically insignificant. Among possible explanations 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 have 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 have been of a directed nature with significant rationing. Whenever authorities attempted to target an economic event, these are in the nature of a reaction to the event, rather than in anticipation thereof. Market forces play very little role in the shaping of monetary policy.

The Growth Sustainability Hypothesis

Tables 5 and 6a through 6d present the test of the growth sustainability hypothesis, namely that growth volatility is bad for the unemployment outlook.[19] Equation 5 deals with the OLS case, where a comparison with Table 2 reveals that once the GRO-squared term (GROS) is added, GRO becomes mildly significant in the OLS specification, albeit GROS still lacks statistical significance. However in the two-stage case, as seen in Tables 6a - 6d, not only is the hypothesis confirmed by the results reported, 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.

Table 5. Testing Growth Sustainability, OLS: Normalized Data in Log

Independent Variables	Dependent Variable	Dependent Variable	Dependent Variable	Dependent Variable
	Log(UET)	Log(UEM)	log(UET)	log(UEM)
Constant	2.917333603	2.854241199	2.930169434	2.855647718
Std error	0.057337083	0.064766171	0.057297261	0.066225445
t-stat	50.88040	44.06994***	51.13978***	43.12010***
GRO	-0.029688660	-0.028296341	-0.029515304	-0.028330205
Std error	0.014847642	0.016790106	0.014696110	0.016898211
t-stat	-1.99955**	-1.68530*	-2.00838**	-1.67652*
GROS	0.001532706	0.001034217	0.001365347	0.001024140
Std error	0.001142253	0.001295184	0.001135245	0.001306058
t-stat	1.34183	0.79851	1.20269	0.78415
SET	-0.007716169		-0.008189745	
Std error	0.002146343		0.002144270	
t-stat	-3.59503***		-3.81936***	
SEB		-0.016756757		-0.016754801
Std error		0.002562351		0.002578539
t-stat		-6.53960***		-6.49779***
LET	0.067393094		0.039829290	
Std error	0.017751838		0.024419378	
t-stat	3.79640***		1.63105	
LEM		0.134152085		0.131516314
Std error		0.019170132		0.029279723
t-stat		6.99797***		4.49172***
EXG			0.006426749	0.000585392
Std error			0.003954049	0.004891969
t-stat			1.62536	0.11966
RIT	-0.017492240	-0.027966440	-0.019138700	-0.028149284
Std error	0.006175051	0.007028339	0.006195246	0.007235770
t-stat	-2.83273***	-3.97910***	-3.08926***	-3.89030***
Number of Observations	85	85	85	85
Degree Of Freedom	79	79	78	79
F-Statistics	7.7796	22.3295	7.0580	18.3781
P-value of F	0.00000541	0.00000000	0.00000502	0.0000000
R-Squared	0.329928	0.585623	0.351879	0.585699
Adjusted R-Squared	0.287518	0.559396	0.302024	0.553830

Table 6a. Testing Growth Sustainability, Second-Stage (with GVE and RDP)

Independent Variables	Dependent Variables	Dependent Variables	Dependent Variables	Dependent Variables
	UET	UEM	UET	UEM
Constant	77.44574911	73.98725481	69.79116360	65.17787731
Std error	6.25859905	6.78476281	4.89054724	5.82169784
t-stat	12.37429***	10.90491***	14.27062***	11.1956***8
GROF	-28.69049129	-27.05518738	-24.04641287	-22.41003963
Std error	3.23071072	3.51207386	2.56580364	3.05736913
t-stat	-8.88055***	-7.70348 ***	-9.37188***	-7.32984***
GROS	3.10086790	2.90480953	2.45202241	2.32189427
Std error	0.38857091	0.42411193	0.31276293	0.37401007
t-stat	7.98019***	6.84916***	7.83988***	6.20811***
SETF	-0.09835287		-0.03943931	
Std error	0.03811805		0.03046699	
t-stat	-2.58022**		-1.29449	
SEBF		-0.18465601		-0.12099293
Std error		0.04293607		0.03865615
t-stat		-4.30072***		-3.12998***
LET	1.37231564		1.05817379	
Std error	0.23488438		0.26330365	
t-stat	5.84252***		4.01883***	
LEM		1.78346787		1.90396448
Std error		0.25513028		0.32587347
t-stat		6.99042***		5.84265***
EXG			0.13377700	0.01326614
Std error			0.04637490	0.06069920
t-stat			2.88469***	0.21856
RIT	0.15065043	-0.03145370	0.18091838	-0.00761227
Std error	0.08815725	0.09596163	0.07781761	0.09348958
t-stat	1.70888*	-0.32777	2.32490**	-0.08142
Number of Observations	85	85	85	85
Degree Of Freedom	79	79	78	78
F-Statistics	28.6214	35.1432	35.5774	32.2645
P-value of F	0.000000	0.00000000	0.000000	0.00000
R-Squared	0.644316	0.689851	0.732386	0.712799
Adjusted R-Squared	0.621804	0.670221	0.711800	0.690707

Table 6b. Testing Growth Sustainability, Second-Stage in Log (with GVE and RDP)

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

Table 6c. Testing Growth Sustainability, Second-Stage (with ROL and RDP)

Independent Variables	Dependent Variables	Dependent Variables	Dependent Variables	Dependent Variables
	UET	UEM	UET	UEM
Constant	83.83024270	80.98728156	68.62512118	65.34774124
Std error	6.60395352	6.98371175	5.14060163	5.87688396
t-stat	12.69395***	11.59660***	13.34963***	11.11945***
GROF	-31.90963603	-30.27512443	-24.29489342	-23.01915683
Std error	3.34924989	3.54633895	2.79140918	3.18590879
t-stat	-9.52740***	-8.53701-***	-8.70345***	-7.22530***
GROS	3.51731570	3.27349813	2.61404734	2.48301129
Std error	0.39923127	0.42367475	0.35506765	0.40522085
t-stat	8.81022***	7.72644 ***	7.36211***	6.12755***
SETF	-0.16421083		-0.10429671	
Std error	0.03795304		0.03414401	
t-stat	-4.32668***-		-3.05461***	
SEBF		-0.22619613		-0.17134279
Std error		0.04047321		0.04025772
t-stat		-5.5887***9		-4.25615***
LET	1.15433409		0.84356548	
Std error	0.23865052		0.27568998	
t-stat	4.83692***		3.05983***	
LEM		1.59717979		1.62342941
Std error		0.25626770		0.32796651
t-stat		6.23247***		4.94999***
EXG			0.08532765	-0.01565023
Std error			0.05086054	0.06210069
t-stat			1.67768*	-0.25201
RIT	0.07101197	-0.06792313	0.04874085	-0.11011448
Std error	0.08699968	0.09209261	0.07865307	0.08982126
t-stat	0.81623	-0.73755	0.61969	-1.22593
Number of Observations	85	85	85	85
Degree Of Freedom	79	79	78	78
F-Statistics	28.0432	37.4312	30.0809	31.7590
P-value of F	0.000000	0.000000	0.000000	0.000000
R-Squared	0.639625	0.703182	0.698242	0.709555
Adjusted R-Squared	0.616816	0.684396	0.675030	0.687214

Table 6d. Testing Growth Sustainability, Second-Stage in Log (with ROL and RDP)

Independent Variables	Dependent Variables	Dependent Variables	Dependent Variables	Dependent Variables
	Log(UET)	Log(UEM)	log(UET)	log(UEM)
Constant	6.812876016	7.466007899	5.759148840	6.145984976
Std error	0.395785569	0.497503537	0.317022077	0.426034133
t-stat	17.21355***	15.00694 ***	18.16640***	14.42604***
GROF	-1.961183321	-2.311266575	-1.416712144	-1.657528933
Std error	0.200725939	0.252633017	0.172146842	0.230956728
t-stat	-9.77045***	-9.14871***	-8.22967***	-7.17679***
GROS	0.220720325	0.259464941	0.154352426	0.183174169
Std error	0.023926573	0.030181613	0.021897103	0.029375757
t-stat	9.22490***	8.59679***	7.04899***	6.23556***
SETF	-0.012768285		-0.008470365	
Std error	0.002274587		0.002105669	
t-stat	-5.61345***		-4.02265***	
SEBF		-0.023072846		-0.017711398
Std error		0.002883218		0.002918411
t-stat		-8.00246***		-6.06885***
LET	0.081262588		0.057214976	
Std error	0.014302710		0.017001864	
t-stat	5.68162***		3.36522***	
LEM		0.130398171		0.120434856
Std error		0.018255921		0.023775342
t-stat		7.14279***		5.06554***
EXG			0.007216200	0.004003474
Std error			0.003136581	0.004501878
t-stat			2.30066 **	0.88929
RIT	0.003059069	-0.004251309	0.001893973	-0.006782188
Std error	0.005214031	0.006560466	0.004850553	0.006511431
t-stat	0.58670	-0.64802	0.39047	-1.04158
Number of Observations	85	85	85	85
Degree Of Freedom	79	79	78	78
F-Statistics	28.9568	42.8131	28.5339	34.5919
P-value of F	0.000000	0.0000000	0.0000000	0.0000000
R-Squared	0.646981	0.730435	0.687002	0.726844
Adjusted R-Squared	0.624638	0.713374	0.662926	0.705833

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), it is to be noted that secondary enrolment now appears to confirm the anticipated reduction in unemployment, albeit the coefficient is double for men. 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 Table 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.

Policy Framework and Conclusion

While preliminary 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 five Arab countries - 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 has 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. Low inflation, low budgetary deficits and predictable public borrowing behaviour are key ingredients of a stable macro policy environment. With a dominant public sector share of the banking industry in many of these countries (often 60% or above), it is likely that credit allocation is not efficient. These markets ought to be allowed to function independent of directed credit policy of the state, but within a credible regulatory framework.

Rodrik (2000) has argued that prevalence of participatory institutions primarily obtaining in a democratic regime, offers better prospects of resiliency to shocks and consequently reduces growth volatility.[20] He goes on to make a case that better institutions have allowed Korea and Thailand to recover ahead of Indonesia from the financial contagion that hit Asia in the late 1990s.

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. The folly of preparing oneself exclusively for civil service jobs has been mentioned. A recent World Bank study (2004a) finds that in most countries included in this sample (e.g., Egypt, Morocco, Tunisia and Jordan), the return to education is higher in the public sector than the private sector at all levels excepting the university level. Another World Bank study (2004b) has pointed out that for women to succeed in the labour market, it would require revising labour legislation and eliminating barriers that raise the cost of hiring women relative to men. However, more generally, institutions need to be developed and nurtured so that the labour market can deliver the right signals to those acquiring human capital.

The 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 men. Rising longevity appears to predict rising unemployment via participation. What can the society do to increase the rate of job creation in order to meet the growing aspirations 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 Southeast Asia) appear to contribute more to job creation than larger enterprises, may form part of such a strategy.

Finally, while the trade-GDP ratio is rather high for these countries vis-à-vis other developing regions, the overall impact on growth, employment or educational attainment have 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. Development of niche export-oriented products that take advantage of local resources would appear as a goal of export and growth policy. This has been cited in other contexts, which essentially calls for diversification of the product base of the economy. On the latter issue, earlier writers have noted that exports of small countries like Czech Republic and Hungary, or even smaller Finland, have been in excess of non-oil exports out of the region (World Bank, 2007a). Some authors cite domestic regulatory environments as discouraging private investment and thus impeding the development of export-oriented industrial sectors (Yousef, 2004).

Can FDI, which has risen in recent years to about 2% of global inflows, play a role here as has been claimed by some?[21] How hospitable is the local environment? Abdih and Chami (2007) point out that traditional preference for public enterprises (e.g., in banking and finance) have led to the crowding out of private investment including FDI. The business environment has been further compromised by excessive regulations, red tape, extended procedures, weak enforcement of property rights, and generally high relative costs of doing business.[22] These authors observe that further trade liberalization may help in this regard since it forces domestic firms to lobby the state and compete for an improved business environment.

At another level, it may be noted that the 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 of benefiting from this. The focus is on applied research with actual country-specific data on capital and labour productivity.

Footnotes

(1) 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, .., 5, and t = 1, …, 17.

(2) 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 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.

(3) The actual source is 'global risk service' surveys carried out by Global Insight, earlier known as Data Resources, Inc (DRI). The data set is made available in Kaufman et al (2007). Ahsan (2003 and 2004) haves explored analyzed more exhaustively the role of do the governance indicators? in the growth and poverty context for the MENA region a s well as transition countries in the former Soviet Union and Eastern Europe.

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

(5) The search for additional data however continues. Suggestions from readers on how to expand the dataset in a consistent basis would be highly appreciated.

(6) The average for dates (t-1) and (t+1) to choose the missing entry for date-t was taken. In other cases (e.g., the last data point), the country average was taken for the sample to obtain the missing observation(s). Clearly, there are other methods for dealing with missing observations, planned to be dealt with in other research.

(7) 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).

(8) The Algerian female participation rate rose from 24% in 1990 to 38% in 2005, some of which would be expected to be spurious due to reasons cited above.

(9) The employment-unemployment figures reviewed relate to the 2000-2005 average for 12 countries highlighted in Chapter 2 of World Bank (2007 a). These 12 include, in addition to the five in the present sample,: Bahrain, Iran, Kuwait, Qatar, Saudi Arabia, UAE and West Bank and Gaza. Where appropriate, these means are contrasted to those obtained for the five sample countries over the period 1990-2006, for a total of 85 observations.

(10) The sample properties described here relate to the 5-country data obtained from World Bank

(2007 a; 2007, b) and ILO (2005). Table A1 of the aAppendix describes the data. The broader regional data has been reviewed in World Bank (2007 a) as noted above.

(11) See Ali (2002) for a broader discussion on the scope of human capital in the MENA context.

(12) The male –female unemployment pattern over 2000-2006 has been reviewed in World Bank (2007a), Table 2.4, p.46.

(13) This is calculated as follows: the incremental growth would be 45% percent of the estimated coefficient of 3.53.

(14) The coefficient is calculated as follows: (∂GRO/∂SET) = [(∂GRO/∂RDP)/ (∂SET/∂RDP)].

(15) The RIT coefficient just misses the 10 percent level of significance in Table 3d, but is highly significant in all other cases (especially Tables 3a and 3b).

(16) Messkoub (2006) cites much lower elasticity on a country-by-country basis. However, these do not appear to be econometric results but rather based on observed growth in sectoral employment and sectoral GDP growth (Table 8).

(17) This is calculated by using the relationship between the derivative of logarithm of a variable and the ordinary derivative. 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.

(18) The estimated EXG coefficients in the employment equations are inconsistent as to sign. These (although not most being statistically significant) suggest that increased export share predicts rising unemployment.! How can you make this conclusion when the results are NOT significant?

(19) 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 h Hence, the first set is presented in Tables 6a through 6d.

(20) Rodrik (2000) contends 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 finds "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).

(21) It may be Nnoted that South Asia has been growing rather fast in the new millennium without much of FDI. FDI flows come in below the 2-percent mark of GDP even for India, and significantly below that in Bangladesh and Pakistan, for example.

(22) These authors go on to note that the minimum capital requirement to start a business in MENA is higher than in any other region, and five times larger than the global average. Time taken to enforce a contract or to import a standard consignment of cargo is, respectively, 50 and 80% higher than in East Asia (and, respectively, 60 and 190% above the industrialized country level).

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Appendices

Table A1. UET (UMT) in the Sample, 1990 -2006
(percentage)

Country	1990	1995	2000	2006
Algeraia	19.8 (20.9)	27.9 (26.0)	29.8 (33.9)	20.3 (19.8)
Egypt	8.6 (5.2)	11.3 (7.6)	9.0 (5.1)	7.8 (4.7)
Jordan	14.7 (13.4)	14.6 (12.1)	13.7 (12.3)	16.1 (12.8)
Morocco	15.8 (14.2)	22.9 (18.7)	21.5 (19.9)	14.5 (12.6)
Tunisia	14.7 (13.4)	19.2 (16.1)	15.7 (15.3)	14.1 (12.9)

Source: World Bank (2007 a, b) and ILO (2005)

Table A2. Sample Properties, 1990 -2006

Country	GRO			(SET/(SEB			EXG			(LET/(LEM			RDP		
	1990	2006	Mean	1990	2006	Mean	1990	2006	Mean	1990	2006	Mean	1990	2006	Mean
Algeria	0.80	3.00	2.65	60.5 (67.2)	83.1 (80.1)	70.5 (72.0)	23.4	52.6	32.3	67.2 (65.9)	71.7 (70.4)	69.6 (68.3)	67.0	68.7	68.7
Egypt	5.70	6.80	4.36	70.8 (79.0)	850 (88.8)	79.6 (84.5)	20.4	31.3	22.5	62.8 (61.4)	70.5 (68.4)	67.4 (65.5)	72.0	76.9	76.9
Jordan	0.97	6.44	5.33	63.3 (62.1)	87.4 (86.6)	79.8 (78.8)	61.9	50.7	49.8	67.5 (66.3)	72.0 (70.5)	70.1 (68.8)	100.0	100.0	100.0
Morocco	4,03	7.27	3.32	35.2 (40.7)	49.7 (53.7)	39.6 (44.2)	26.5	37.8	29.7	64.3 (62.7)	70.4 (68.2)	67.9 (65.9)	49.1	52.4	52.4
Tunisia	7.95	5.20	4.88	44.6 (49.8)	83.9 (80.2)	66.4 (66.8)	43.6	54.4	44.4	70.3 (68.6)	73.5 (71.5)	72.0 (70.1)	76.1	71.6	71.6
MENA_5 Average, 1990-2006	4.11			67.2 (69.3)			35.7			69.4 (67.7)			73.9		

Source: World Bank (2007 b). All entries are shown in percentage terms.